PUBLIC LIGHTING CONSULTATION PAPER

Acknowledgment of Country

United Energy acknowledges and respects the Traditional Owners as the original custodians of the lands and waters our network covers. We recognise First Peoples' unique and inherent rights as Traditional Owners and thank all Traditional Owners for continuing to care for Country and their deep spiritual connection to it. United Energy honours Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

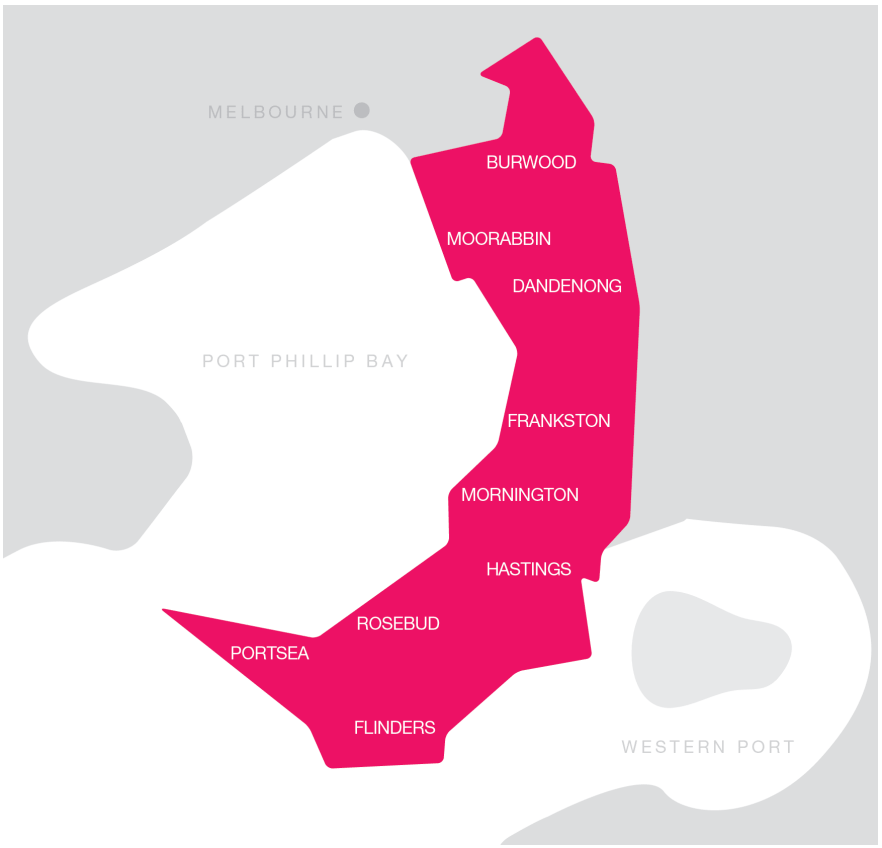
Who we are

United Energy owns and operates the network of substations, powerlines, underground cables and power poles that supplies electricity to 700,000 residential and commercial customers across south-east Melbourne and the Mornington Peninsula.

We construct, run, and maintain this distribution network every day with the goal of offering a dependable, efficient, and safe energy supply.

Within our network distribution area shown below, we also offer public lighting services, which are the subject of this consultation document.

Figure 1 United Energy distribution supply area



Purpose of the consultation

Every five years we submit a proposal to the Australian Energy Regulator (AER) outlining our plans for the next five years of serving our communities, including our planned expenditure and prices.

A proposal for the period from July 1, 2026 to June 30, 2031 (2026-31) must be submitted to the AER in January 2025.

This consultation paper focuses on our public lighting services for 2026-31 period and summarises feedback we have received from our involvement with these services as well as our initial thinking.

How we will use your feedback

We will consider all comments we receive to inform the development of our 2026-31 regulatory proposal, which we will submit to the AER in January 2025.

United Energy's 2026-31 regulatory reset timeline is shown below.

Table of contents

Contents

Introduction

United Energy own, operate and maintain more than 122,000 public lights across its network area, which encompasses 15 municipalities as well as the Department of Transport and Planning. Local Councils are our key public lighting customers, representing over 82% of public lights on our network.

Public lighting is an essential service that promotes safety of communities and roadway users. Our commitment lies in assisting our clients to ensure the provision of secure and reliable public lighting for the community in a manner that is both efficient and minimally detrimental to the environment.

Our prices for public lighting services are regulated by the AER separately from our distribution network tariffs. However, our network operations facilitate the provision of these services, affording us the opportunity to leverage economies of scale in the planning, delivery and administration.

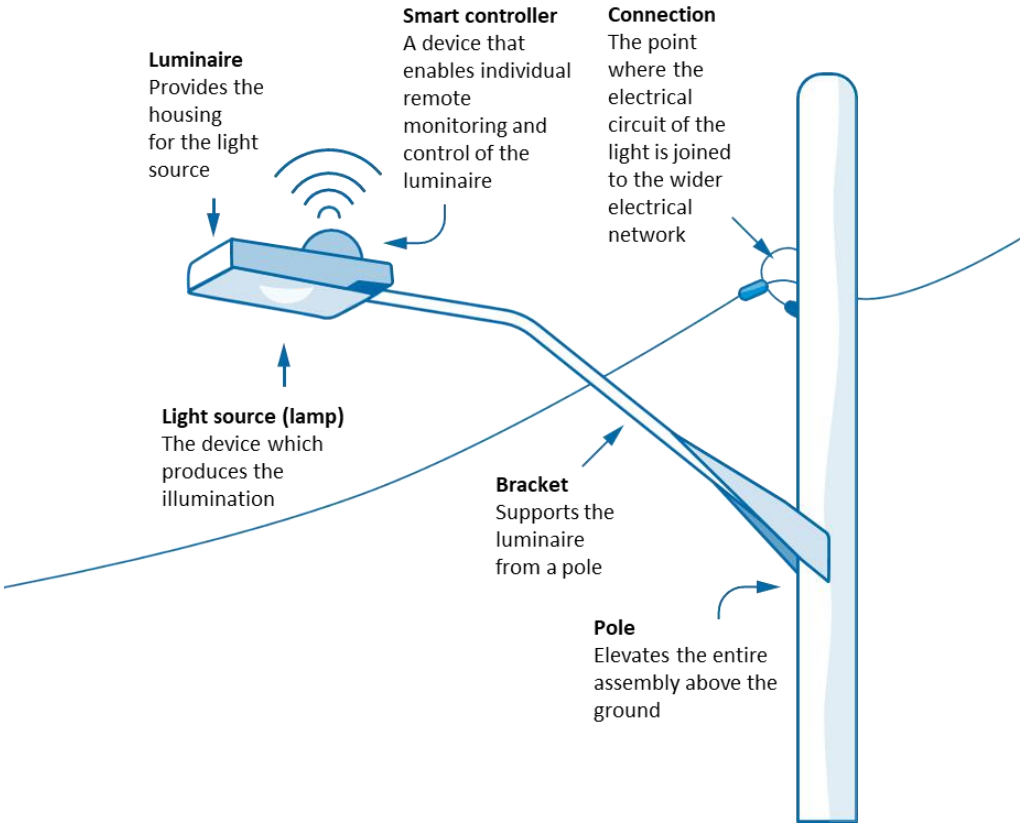
1.1 What is involved in providing public lighting services

We construct, operate and maintain public lighting to meet the requirements set by the Essential Services Commission (ESC) and the needs of our public lighting customers.

United Energy is responsible for operating, maintaining, repair and replacement the public lighting assets in our distribution area. The provision of public lighting is a critical service that plays an important role in enhancing public safety and security in public areas.

The costs of providing this service are recovered through published Operation, Maintenance, Repair and Replacement (OMR&R) tariffs and billed to councils and Department of Transport and Planning for roads that are cost shared as defined in the Road Management Act.

The main components of public lights are shown below.



Public lighting systems include all infrastructure associated with providing lighting in public spaces, including the point of connection to the electricity distribution network.

Public lighting lamps have historically been mercury vapor (MV). In co-operation with public lighting customers, we are progressively transitioning to more energy efficient light-emitting diode (LED) technology given our commitments to:

- the Australian Government's ratification of the Minamata Convention to protect human health and the environment from the adverse effects of mercury.
- cost and efficiency improvements for public lighting customers, and
- supporting the transition to net zero carbon emissions.

This Consultation Paper presents the most important public lighting related topics for the 2026-31 regulatory period. These topics are open to stakeholder and customer consultation and are anticipated to undergo adjustments or developments to align with the feedback received from customers throughout the consultation process.

1.2 What the rest of this paper covers

The rest of this consultation paper explains our current thinking, as informed by customers, on our public lighting services for 2026-31, and seeks your feedback on the most important topics in the 2026-31 period:

- Transition to LED public lighting
- Implementation of a Central Management System (CMS)
- LED lamps in decorative lanterns
- Solar powered lights
- Transition legacy lighting schemes in non-trafficable parks, gardens and laneways back to Council management and control
- Tariff changes.

Discussion of topics

2.1 Transition to LED public lighting

LED lights use about 60% less energy compared to legacy lights. Furthermore, their prolonged lifespan and reduced maintenance needs translate to decreased operational costs.

We are currently part way through the transition, so our public lighting infrastructure includes a combination of legacy lights and new LED lights.

What we have achieved together so far

Since 2013, we have replaced approximately 75,000 or 63% of legacy lights with LED lights in streetlights, mainly on minor roads (for example residential roads) across our network.

In 2017, we started replacing legacy luminaires on major high-traffic roads, including introducing smart controllers (PE cells). We also approved the use of LED decorative lights and in the case of legacy minor road decorative lights, the use of a LED lamp to extend the serviceable life of the light.

In response to customer expectations, environmental concerns about mercury products, and global winding down of legacy lamp production, we have adopted a phased approach to LED conversion. We started with the replacement of our legacy MV lights with LED lights and have commenced the replacement of compact fluorescent lights which can no longer be reliably sourced.

Proposed strategy going forward

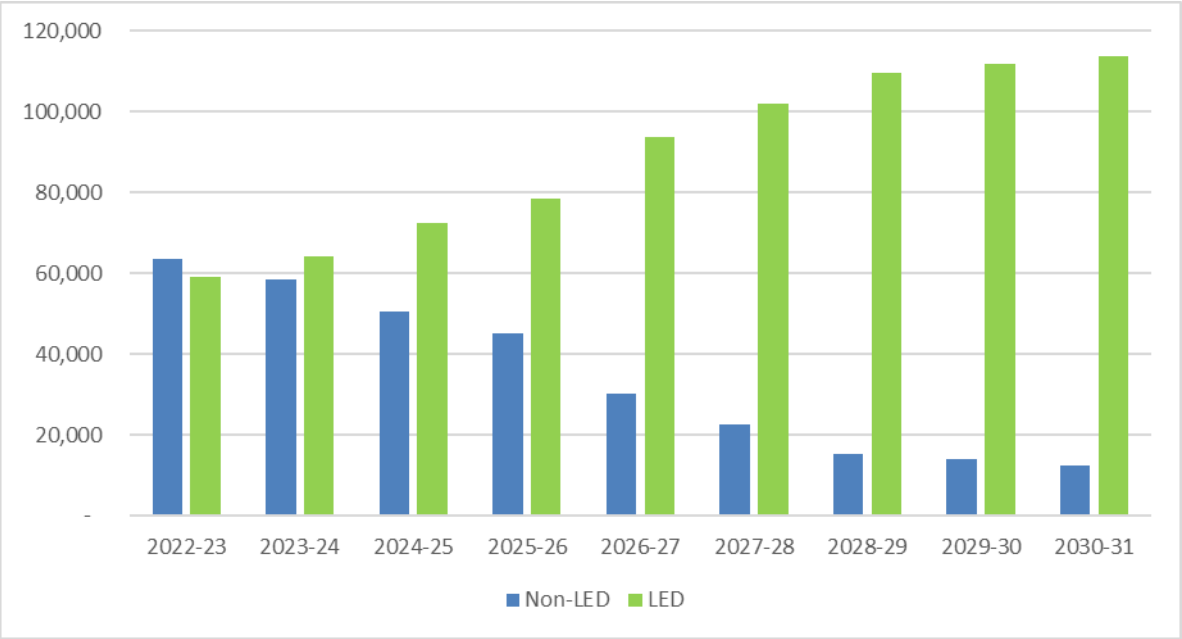
We plan to convert all public lighting to LED over time to:

- meet Australia's commitments in the Minamata Convention in 2021 to eliminate the use of mercury in lamps and more recently to also prohibit the use of compact fluorescent lamps (CFL) from the end of 2026 and T5 fluorescent lamps from end of 2027. This will accelerate the transition of these light types to LED.
- respond to customer expectations regarding potential energy cost savings.
- support both Victorian and Commonwealth Governments' commitment to lower carbon emissions, through lower energy consumption.
- proactively put United Energy in the best position to support public lighting, given manufacturers across the world are transitioning toward LED technology, and
- provide further energy efficiency opportunities when combining LED lights with smart control devices. This approach will be an enabler for significant energy cost savings for our customers in the future.

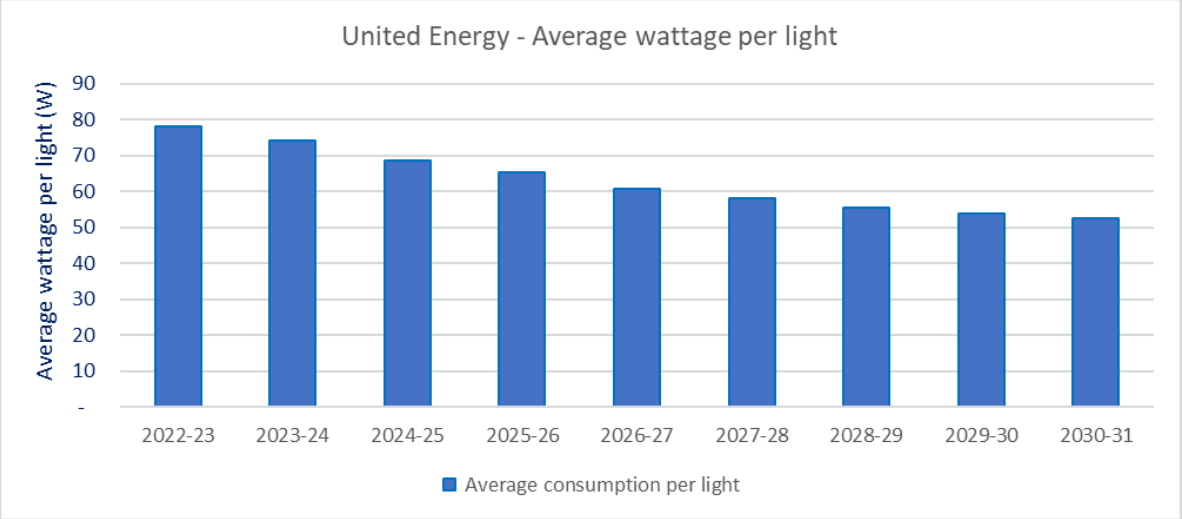
We plan to:

- achieve 100 per cent MV replacement by 2026
- achieve 100 per cent CFL replacement by 2026
- commence T5 replacement from 2026
- continue transition of high pressure sodium lights at end of serviceable life to LED.

The following chart shows the planned LED deployment across the United Energy area from FY2022/23 to FY2030/31.



The following chart shows the potential, estimated average wattage per light as our public lighting network is transitioned to LED technology. The graph assumes all lights except for sodium high pressure lanterns would be converted to LED by 2030-31.



For United Energy, there is a reduction of over 32 per cent in the average wattage per light from 78W in 2022-23 down to 52W by 2030-31.

This significant reduction in energy consumption (and associated lower energy costs and lower carbon emissions) is one of the drivers for the proposed acceleration of conversion to LED.

2.2 Implementation of a Central Management System (CMS)

Currently, most public lights are controlled by photoelectric cells that include a photo-sensitive element which measures the ambient light levels and switches the light on and off.

Over the past few years a number of Councils have invested in the installation of smart PE cells as part of their LED rollout program. United Energy has been supportive of this initiative and assisted with back-office integration.

To facilitate active management of streetlights will need implementation of a Central Management System (CMS) which will be an enabler for smart lighting opportunities. Due to demand from some councils, United Energy will install the CMS before 2026. Initially, United Energy is proposing a basic CMS service where Councils would initially be provided access to data through a portal and also be able to control the light output with further development of an agreed smart PE cell operation protocol as part of the initial release.

Benefits of the basic CMS for public lighting customers would include:

- public lighting faults will be resolved more quickly
- control capability to enable dimming per device or group of devices which would reduce energy consumption and greenhouse gas emissions
- enabling constant light output maintenance (CLO). Lighting output at prescribed compliance levels throughout the lifespan of the luminaire is achieved by gradually adjusting power to counteract lumen depreciation.

The main ongoing costs items incurred in providing the basic CMS service are:

- Internal IT support for smart cells
- AMI communications network related costs (operation of the mesh network)
- IT vendor related costs

The basic CMS service could potentially be enhanced in the future to provide:

- Optimisation of energy consumption and cost reduction facilitated by remote control functionalities inherent in smart devices. These devices can be programmed to regulate the activation and deactivation of lights at specific times or adjust brightness levels according to the time of day or prevailing conditions.
- Dimming and brightening functionalities: Dimming is typically executed during non-peak periods or in accordance with ambient light conditions, offering benefits to wildlife conservation and minimizing sky glow. Brightening capabilities beyond the baseline during peak times respond to adverse weather conditions, special events, or emergencies.
- Trimming operations: This involves the optimization of both activation and deactivation times.
- Metering capabilities: Actual energy consumption measurement rather than relying on estimations, potentially delivering energy savings.
- Emission reduction support: Aligning with the Victorian Government's commitment of net-zero target by 2045 through the implementation of emission reduction measures.
- CMS is also an enabler for other IoT sensors with our existing mesh network able to be utilised for additional sensors[1].

[1] To be tested and verified in the future

We propose to introduce a basic CMS service together with the development of an agreed smart PE cell operation protocol prior to the start of the forthcoming regulatory period.

We propose to spread this cost across all light type, incurring a minimal incremental charge on a per light basis. We believe that this ensures that all public lighting customers will benefit from improved services.

2.3 LED lamps in decorative lanterns

The cessation of MV and Compact Fluorescent lamps presents a challenge for United Energy and Councils, especially concerning existing decorative non-standard lanterns. These unique fixtures often hold historical or aesthetic significance within communities, making their preservation essential.

To address this issue, the introduction of a service to fit LED lamps to these non-standard lanterns serves several crucial purposes:

- Preservation of aesthetics: Many of these decorative lanterns contribute to the visual identity and ambiance of local areas. Retrofitting them with LED lamps allows councils to maintain the original charm and appearance of these fixtures while upgrading their lighting technology.
- Environmental considerations: LED lamps are energy-efficient and eco-friendly, offering a more sustainable alternative to mercury vapor or compact fluorescent lamps. By transitioning to LED, councils can reduce energy consumption and lower the environmental impact associated with older lighting technologies.
- Cost-effectiveness: Retrofitting existing non-standard lanterns with LED lamps extends their lifespan and reduces the frequency of replacements or refurbishments. This approach offers a cost-effective solution compared to completely replacing the fixtures, allowing councils to allocate resources more efficiently.
- Compatibility and adaptability: LED lamps are versatile and can often be adapted to fit various types of fixtures, including non-standard decorative lanterns. This adaptability ensures that councils can embrace modern lighting technology without compromising the unique design or functionality of these fixtures.
- Community satisfaction: Preserving these decorative fixtures through LED retrofitting addresses community sentiment and attachment to these elements of local heritage. It demonstrates a commitment to preserving historical or aesthetically significant features that residents value.
- Compliance with regulations: The transition from MV and CFL lamps aligns with evolving regulations and standards, promoting the use of safer and more efficient lighting technologies in line with contemporary environmental and safety guidelines.
- The cost for fitting LED lamps is included in our current OMR&R services and avoids additional costs involved in removing and refitting lanterns.

We propose to continue retrofitting LED lamps to existing non-standard decorative lanterns. It allows councils to navigate the discontinuation of MV and CFL lamps effectively and enables the continuation of the functional and aesthetic benefits of these fixtures while embracing modern, energy-efficient, and environmentally friendly lighting solutions.

2.4 Solar powered lights

In the last few years, we have been trialling solar lights on our network. These streetlights offer a sustainable, cost-effective, and reliable solution for public lighting, addressing both environmental and economic concerns.

- Energy efficiency: They reduce reliance on the network, thus lowering energy costs to local authorities.
- Cost savings: Once installed, solar streetlights have minimal operational costs since they don't require electricity from the grid. However, there is also increased maintenance due to requirement to monitor and replace batteries at end of life.
- Environmentally friendly: Solar streetlights generate clean energy, reducing carbon emissions and contributing to a more sustainable environment.
- Remote locations: They can be installed in remote or off-grid areas where access to the grid is limited, providing illumination and safety to these areas. However, access may be compromised if placed in parks and gardens that are not suitable for our vehicles.
- Easy installation: These lights are relatively easy to install since they don't require extensive wiring or infrastructure, which can reduce installation time and costs. However, theft of equipment (battery, solar panel and lantern) is a concern as they are not connected to our network.
- Reliability: Solar streetlights often include backup mechanisms like batteries to store energy, ensuring continuous operation even during cloudy days or in areas with limited sunlight. There are also safety concerns if the light is not operational due to extended duration of minimal solar gain.
- The ongoing cost to operate and manage these solar lights would be similar to equivalent light types with allowance for higher capital replacement costs in the future.

We propose to continue trialling solar lights on our network and we are seeking feedback from our customers on their interest in us making this a potential network offering within the next pricing period (2026-31).

2.5 Transition legacy lighting schemes in non-trafficable parks, gardens and laneways back to Council management and control

Councils have shown an interest to manage and control public lighting schemes in areas generally inaccessible for standard public lighting maintenance vehicles. Working together, we would like to support this transition for the following reasons.

- Safety: The primary concern revolves around lighting that is attached to both residential and commercial buildings in laneways. Removing low voltage assets is a positive safety step, enabling installation of extra low voltage lighting which is safer and more flexible. Also, although parks and gardens are more controlled by Councils there is significant risks with electrical assets installed underground in these areas.
- Access: Over the past ten years we have seen a re-vitalisation of laneways, parks and increasing pedestrian activity. These changes have resulted in significant challenges to operate and maintain low voltage public lighting assets.

To achieve this outcome, costs would be recovered though proposed OMR&R services.

We propose to continue to assist Councils to transition lighting schemes in parks, gardens and laneways back to Council management through creation of agreed points of supply and where appropriate, transfer of ownership of existing public lighting assets to Councils.

2.6 New services identified within the regulatory period

Periodically, within a regulatory period, we encounter newly identified services or light types lacking pricing established by the AER. We intend to develop pricing consistent with other services within the corresponding classification.

This approach grants us the flexibility to offer new, unanticipated services while ensuring our customers benefit from the safeguard of a regulated pricing framework.

2.7 Tariff changes

Our current public lighting tariffs are developed to reflect:

- the type of technology (LED or conventional) in use and
- road type (major or minor).

This approach ensures charges are consistent and stable over time and easy to understand.

Once we have received and considered feedback from public lighting customers, we will build up public lighting charges and once again consult with public lighting customers.

When the impact of reduced energy consumption is considered, we expect the transition to LED lighting will ultimately reduce the overall cost of public lighting for councils.