Essential Energy's Public Lighting Management Plan CEOP1023

DISCLAIMER
Essential Energy may be required to update the information in this document during the 2024-2029 regulatory period. Essential Energy will consult with Public Lighting Customers prior to implementing any changes to the document and will distribute the updated document electronically and update on our website. All changes take effect on the date specified by Essential Energy. A print version is always an uncontrolled copy. Before using this document, please ensure that it is still current by visiting Essential Energy's website www.essentialenergy.com.au.

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1.0 INTRODUCTION

Public lighting is a vital community service that remains a strong part of Essential Energy's comprehensive network strategy. Public lighting can assist in reducing night-time accidents, crime and offers social and economic benefits by encouraging the positive use of public areas at night.

The purpose of this Public Lighting Management Plan (The Plan) is to establish the foundations on which Essential Energy's public lighting service will be delivered to customers as well as how we intend to meet the requirements of the NSW Public Lighting Code (The Code). Compliance with The Code is mandatory and forms part of Essential Energy's network operator licence conditions.

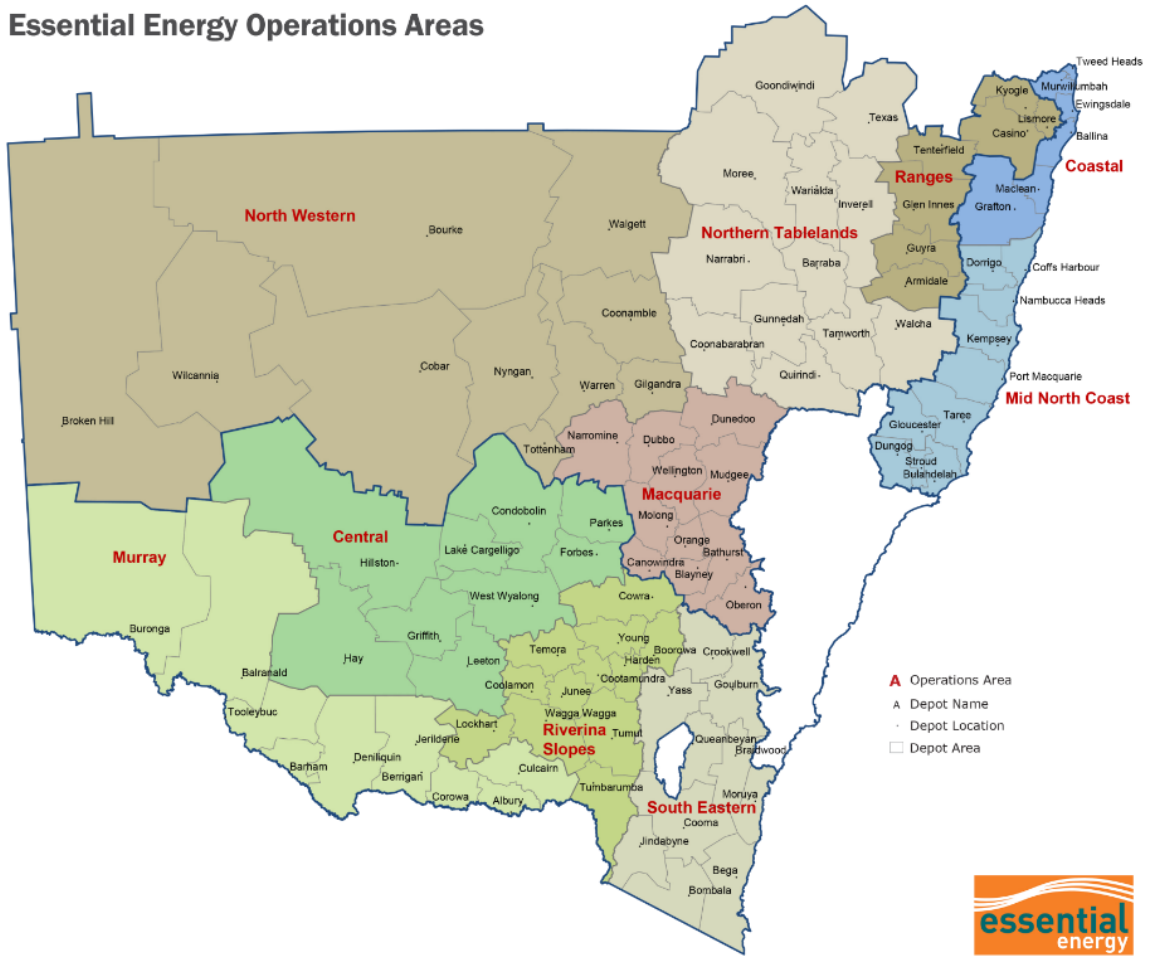
Customers wishing to vary any operational aspect set out in The Plan must do so in writing which is subject to agreement with Essential Energy.

This document has been prepared in accordance with the NSW Public Lighting Code 2023 and is available at Public lighting code | NSW Climate and Energy Action.

2.0 ABOUT ESSENTIAL ENERGY

Essential Energy is a leading Australian Distribution Network Service Provider owned by the New South Wales Government. We operate and maintain one of Australia's largest electricity networks - delivering essential electricity network services to more than 860,000 homes and businesses across 95 per cent of NSW and parts of Southern Queensland.

Essential Energy owns and maintains approximately 167,000 public lighting luminaires and 79,000 dedicated streetlight columns for more than 90 Public Lighting Customers including 85 local councils. Essential Energy also owns and maintains public lighting assets on behalf of Transport for NSW.



3.0 PUBLIC LIGHTING OBJECTIVES

Essential Energy's Public Lighting objectives are to:

- Meet customer and local community needs for effective lighting, reliability, energy efficiency, safety, and environmental performance.
- Meet all requirements set out in The Code.
- Minimise total lifecycle costs to Essential Energy Customers.
- Maintain compliance with all relevant codes and standards in all public lighting maintenance and installation activities.

This management plan applies to all Essential Energy owned and maintained public lighting infrastructure.

4.0 PUBLIC LIGHTING SERVICE REPRESENTATIVE

Essential Energy's Public Lighting business is jointly managed across our Asset Engineering and Commercial Services divisions.

The nominated public lighting representative for Essential Energy is:

Adele Finch – Public Lighting and Unmetered Supply Manager

PO Box 5730

Port Macquarie NSW 2444

Streetlighting@essentialenergy.com.au

Public Lighting customers are obliged under clause 6 of The Code to nominate a customer representative whom Essential Energy will liaise with for all matters under this Code.

5.0 PUBLIC LIGHTING CONTACT DETAILS

Description	Contact Details
General enquiries, data corrections, billing details and inventory enquiries	Streetlighting@essentialenergy.com.au
Vegetation management for overhead connected public lighting	13 23 91
Dispute resolution beyond Public Lighting Team	Head of Strategic Council Partnerships Geoff.Burgess@essentialenergy.com.au
Fallen electrical wires, power outage, electric shock, or a life-threatening situation	13 20 80
Report a streetlight fault	13 20 80 Report Streetlight Faults (essentialenergy.com.au)

6.0 RESPONSIBILITIES

Essential Energy and its customers have responsibilities for compliance with codes, standards and guidelines which are in place where Essential Energy owns the public lighting assets.

6.1 Essential Energy's responsibilities

Essential Energy is responsible for:

- Processing applications for Contestable projects as per the Accredited Service Provider (ASP) Scheme Rules and Essential Energy's Construction and Supply Standards;
- Complying with all reporting requirements, service levels and delivering Minor Capital Works projects in compliance with The Code;
- Documenting processes that outline how Essential Energy complies with relevant regulations and standards including The Plan.
- Process warranty claims as they arise. Where not accepted by the manufacturer consider recovering the residual cost and replacement cost of the luminaire from the Public Lighting Customer.
- Invoicing the cost of the service to the customer for the maintenance and capital recovery of Essential Energy assets, as well as residual value charges where applicable.
- Invoicing energy usage for Essential Energy assets and unmetered private lighting.

6.2 Expectations of Public Lighting Customers

For any Essential Energy owned public lighting assets, the Customer will:

- Nominate a Public Lighting Representative and advise of any changes to this Representative as soon as practicable.
- Determine whether public lighting is required for local, state and regional roads and determine the appropriate lighting levels as part of any planning process.
- Advise of amendments to roadway classifications to ensure compliant lighting levels are met in line with AS/NZS 1158. Where changes occur to roadway classifications and the Customer wishes to amend lighting levels, the Customer may utilise the Minor Capital Works process.
- Promote Essential Energy's streetlight fault reporting phone line and webpage to residents on its website and in communications with residents as appropriate.
- Consult with the local community about the specific lighting strategies in nominated historical precincts, semi-rural areas and outlying villages and inform them if the proposed lighting strategies do not meet the requirements of AS/NZS 1158 and the reasons for this.
- Undertake lighting assessments in relation to the installation of lighting on pedestrian crossings and roundabouts or where general concerns including obtrusive glare are raised in relation to lighting levels. The Customer shall advise Essential Energy of any changes requested, which may be undertaken as Minor Capital Works or through our Glareshield application process.
- Implement vegetation management programs to facilitate light egress as per Essential Energy's Vegetation Management Plan (CEOP8008).
- Consult Essential Energy when developing new or amending existing subdivision and development guidelines relating to public lighting.
- Liaise with Essential Energy to jointly action any issues that are brought to their attention by residents and other stakeholders including but not limited to streetlight faults, inadequate lighting, obtrusive glare, or vegetation concerns.
- Apply to Essential Energy via the connections process (https://www.essentialenergy.com.au/our-network/connecting-to-the-network) in advance of works of any proposal to add, relocate, replace (with lower or higher wattages) or remove public lighting assets currently connected to the unmetered network and subsequently managed by Essential Energy. This requirement includes any customer privately owned assets managed as unmetered assets.
- Advise Essential Energy where they wish to attach anything on any Public Lighting Equipment.

- Ensure that contestable projects, as defined in The Code, comply with the requirements of all regulations and standards. This includes the Customer accepting risk and responsibility for the illumination design provided by its ASP or equivalent.
- For private unmetered assets, where requested, engage an independent party to perform an audit of assets in a timely manner to ensure unmetered loads are accurate in compliance with Metrology Procedures.
- For private unmetered assets, the owner must advise in advance of work or any changes to luminaire consumption load to facilitate accurate metering of energy. All luminaires used on unmetered installations must be included on the Australian Energy Market Operator (AEMO) Unmetered Load Table, available on the AEMO website.
- Efficiently communicate with Essential Energy around: ownership enquiries, delay notifications and private defect rectification.
- Review monthly billing reports for payment of SLUoS fees.
- Review quarterly and annual IPART performance reports.

6.3 Regulations and Standards

Essential Energy must comply with a range of regulations, standards, and guidelines. These requirements include but are not limited to the following:

- Electricity Supply Act 1995 and regulations made under the Act.
- The NSW Public Lighting Code 2023
- NSW Accredited Service Provider Scheme Rules
- The Australian Energy Regulator's (AER) Final Decision
- National Electricity Rules
- Electricity Safety Rules
- AEMO Metrology Procedures and Unmetered Load
- All relevant Essential Energy Network Standards
- Service and Installation Rules of NSW
- Electricity Transmission and Distribution Asset Management: Code of Practice
- SafeWork NSW – Codes of Practice
- National Energy Customer Framework
- Industry Safety Steering Committee (ISSC) Guidelines
- Australian Standards/New Zealand Standards e.g.,1158
- National Guidelines for Protecting Critical Infrastructure from Terrorism
- NSW Maritime Crossings of Navigable Waters

7.0 EQUIPMENT SELECTION AND REPLACEMENT

7.1 Standard Public Lighting Equipment

Essential Energy maintains an Approved Material List (AML - CEOM7004) of equipment that can be installed on its network. This list is available on Essential Energy's document library which can be found at https://www.essentialenergy.com.au/partners/document-library. The AML contains a list of current standard luminaires, columns and brackets that shall be used for all new and replacement public lighting installations.

Essential Energy will use equipment on the AML to replace eligible equipment that has reached the end of its economic or serviceable life. In cases where this cannot be like for like, Essential Energy's Public Lighting Maintenance Standard (CEOS5126.02) details the default replacement for existing equipment in service. Equipment that is replaced will be placed on an appropriate tariff on the public lighting price list to recover charges approved by the AER.

Essential Energy will consider customer requests for the addition or removal of Public Lighting Equipment to the standard AML. Essential Energy will consult with customers on proposed additions, removal of public lighting equipment options or any major technology changes to the

standard lighting equipment options available on the AML. Consultation may involve agreement on technical specifications and sourcing strategies. Where changes to the standard luminaire list impacts on customers charges, this too will be subject to consultation. Consultation does not apply to incremental advances on current technology or minor design amendments such as improvements to LED power supplies and LED modules.

Procurement procedures will be governed by Essential Energy's Procurement Policy. Essential Energy will assess products in accordance with agreed specifications and using criteria such as:

- Compliance to relevant Australian and International standards
- Product technical and economic life
- Product maturity
- Warranty provisions
- Total life cycle cost
- Energy efficiency
- Compliance to Essential Energy's design and construction requirements.

7.2 Non-Standard Public Lighting Equipment

Essential Energy does not wish to install or maintain any Non-Standard Public Lighting Equipment. Essential Energy will continue to maintain existing Non-Standard Public Lighting Equipment owned by Essential Energy on fair and reasonable terms outlined below until the equipment is no longer covered under warranty or the cost to maintain exceeds the fees received through SLUoS charges.

Non-Standard Public Lighting Equipment is defined as equipment that is not available on the AML.

Essential Energy also do not wish to own a portion of public lighting equipment so where one component is non-standard, the whole public lighting equipment will be considered for handover to the Public Lighting Customer. Further, Essential Energy does not wish to own public lighting equipment mounted on assets which it does not own, e.g., public lighting on bridges or buildings or under awning lighting.[1]

7.2.1 Existing Non-Standard Public Lighting Equipment

Existing non-standard installations that utilise equipment that is not on the published AML will continue to be maintained on fair and reasonable terms until the end of their economic life or until they are no longer serviceable.

Public Lighting Component	Economic Life
LED luminaire	10 years
HID luminaire	20 years
HID globe/lamp	4 years
Column/Pole	35 years
Bracket/Outreach	35 years

Essential Energy will maintain non-standard luminaires in line with the below:

<u>Decorative LED luminaires</u>

- Decorative LED luminaires upgraded as part of the Bulk LED Program will continue to be maintained until the:

[1] This does not include Night Vision assets.

- luminaire is no longer covered under warranty (10 years), at which time, the luminaire, bracket, and column will be offered to Council to maintain. If Council does not wish to maintain the light, it will either be upgraded to a standard luminaire, bracket, and column in line with our AML or Council can request removal of the luminaire, bracket and column under the Minor Capital Works process.
- If the luminaire fails and is not accepted under warranty, Councils will be requested to procure the Non-Standard Luminaire in line with The Code. Where the luminaire fails, the Customer is responsible for replacing the Non-Standard Luminaire. If the Customer does not identify and source a suitable replacement for the Non-Standard Luminaire within 100 Business Days of the date on which the need for replacement is identified by Essential Energy, Essential Energy will replace the Non-Standard Luminaire with a Luminaire from the AML.

Decorative HID luminaires

- Decorative HID luminaires not upgraded under the Bulk LED Program will continue to be maintained where the cost of maintaining does not exceed the replacement cost for a like for like LED replacement until the end of its economic life.
- Once the decorative HID luminaire reaches the end of its economic life, Councils will have the option to either retain the HID decorative luminaire and take ownership of the luminaire, bracket and column or remove the luminaire, bracket and column under the Minor Capital Works process.
- If the luminaire or globe/lamp fails prior to the end of its economic life, Essential Energy will offer the Customer a standard LED luminaire replacement from our AML in line with our like for like replacement matrix. Globes/lamps are no longer readily available to support globe/lamp replacements. Where Council does not wish to use a standard luminaire or upgrade to an LED decorative luminaire, Councils may opt to take over ownership or remove the luminaire under the Minor Capital Works process.
- Where the HID decorative luminaire fails and Council wish to upgrade to a decorative LED luminaire, Customer is responsible for replacing the Non-Standard Luminaire in line with The Code. If the Customer does not identify and source a suitable replacement for the Non-Standard Luminaire within 100 Business Days of the date on which the need for replacement is identified by Essential Energy, Essential Energy will replace the Non-Standard Luminaire with a Luminaire from the AML.

Under awning and fluorescent tubes

- Under awning lights and fluorescent tubes – will continue to be maintained until the luminaire/ballast or globe/lamp:
  - reaches the end of its economic life, at which time Councils will be given the option to either take ownership of the luminaire/ballast and globe/lamp or remove these assets under the Minor Capital Works process.
  - fails and the cost to maintain exceeds the SLUoS revenue for this asset type. Essential Energy does not have an LED replacement option for these products, as such, Councils can opt to take ownership of these or remove these under the Minor Capital Works process.

Other Non-Standard luminaires, globes/lamps, brackets/outreaches, and columns/poles

- All other non-standard luminaires, globes/lamps, brackets/outreaches and columns/poles will be maintained until the:
  - Asset reaches the end of its economic life or is not covered under warranty with the supplier, at which time Councils can either take ownership or opt to remove the assets under the Minor Capital Works process.
  - Cost to maintain the assets exceeds the like for like LED replacement cost and an LED alternative is available, at which time, Councils can allow for standard asset installation per our AML, take ownership or remove assets under the Minor Capital Works process.

- Cost to maintain the assets exceed the SLUoS revenue generated by the asset type and where an LED alternative is unavailable, at which time, Councils can take ownership of assets or remove the assets under the Minor Capital Works process.

Changes will be reflected in Customers inventory and appropriate tariffs applied.

7.2.2 New installations of non-standard public lighting equipment

Customers can choose to use equipment that is not on the AML however, Essential Energy is not obliged to install or maintain these installations. As a rule, these installations will be required to be converted to a metered installation and maintained by the customer.

Private unmetered installations may only be used at the discretion of Essential Energy and where the lighting is approved as a fixed load on the AEMO Unmetered Load Table (AEMO | Metrology Procedures and Unmetered Loads).

Essential Energy will consider the following when assessing whether to approve the installation of a non-standard luminaire:

- the mounting facility for the Non-Standard Luminaire complies with SA/SNZ TS 1158.6:2015 Section 2 Mechanical and Physical Requirements and Recommendations;
- the Non-Standard Luminaire is an LED;
- the Non-Standard Luminaire is listed on the NEM Load Table (Unmetered Loads) published by the AEMO or the Customer demonstrates in writing that the manufacturer has applied, or agreed to apply, for listing on the NEM Load Table (Unmetered Loads);
- the Non-Standard Luminaire has a NEMA/ANSI C136.41 7 PIN dimming receptacle unless otherwise agreed between the Customer and Service Provider;
- the Customer agrees to pay the reasonable maintenance costs of the Non-Standard Luminaire which do not present significant additional maintenance risks for the Service Provider;
- the Customer agrees to pay the reasonable costs of the Service Provider for technical assessment of the Non-Standard Luminaire; and
- the Non-Standard Luminaire complies with all technical specifications set by the Service Provider.

Where Customers wish to install non-standard equipment on the unmetered network and the equipment meets the above conditions, the Customer must follow the non-standard approval process available at Support (essentialenergy.com.au).

Essential Energy has 30 business days under The Code to provide a determination on the request for installation of non-standard luminaires.

7.2.3 Requests for public lighting equipment to be added or removed from the AML

A Customer may propose that a specific lighting technology for a luminaire be added or removed from the AML by emailing Streetlighting@essentialenergy.com.au with the following information:

- technical specifications of the lighting technology for the luminaire including reliability metrics.
- evidence that the specific lighting technology provides a value benefit, through reduced operating costs, improved reliability, or improved light function for an equivalent cost relative to an existing technology on the AML.
- evidence that the lighting technology complies with relevant Regulations and Australian Standards including AS/NZS 60598.2.3:2015 Luminaires Part 2.3: Particular Requirements – Luminaires for road and street lighting.
- supplier information including; cyber security protocols and lifecycle product costs.

Essential Energy may consider the below when assessing whether the lighting technology should be added to the AML:

- the frequency of changes in the lighting technologies for luminaires included on the AML;
- the number of luminaires on the AML;
- potential increases in costs to Essential Energy where this could not be directly recovered from Customers;
- resources and skillsets readily available to maintain the lighting technology.

For the removal of doubt, this process does not apply where an update occurs to a specific model already on the AML or where the manufacturer ceases to make the specific model.

Once assessed, Essential Energy must consult with its Customers with respect to the:

- addition or removal of the technology for a luminaire to the AML
- technical specifications for the technology;
- strategies for sourcing the technology; and
- annual cost to Customers including the capital and operating costs of the technology.

Essential Energy has 30 business days post consultation processes to provide a decision on the request to include the lighting technology on the AML.

8.0 DESIGN AND CONSTRUCTION

Public Lighting assets that are to be owned and operated by Essential Energy on behalf of Public Lighting Customers shall be designed and constructed in accordance with Essential Energy's Network Construction Standards using equipment from Essential Energy's AML. This applies to all contestable and non-contestable works.

Where works are deemed contestable, the Customer shall use an ASP to complete the electrical design, illumination design and construction work as per CEOS5126.02.

Essential Energy has a limited obligation to provide public lighting services to public customers who request it, i.e., Essential Energy is not obliged to take ownership of all lighting installations. In addition to meeting the design and construction requirements, Essential Energy will only take ownership if the assets meet all the following criteria:

- Installed on a public roadway or readily accessible public reserve.
- Installed on an existing public lighting customers privately owned land where easements have been established in favour of Essential Energy for the installation and maintenance of electricity assets.
- Readily accessible or where access will be made available by the Public Lighting Customer within normal working hours and within the service timeframes set out in the Public Lighting Code.
- Installed in a location that enables maintenance works to be undertaken using an elevated work platform (EWP) at a cost not dissimilar to costs recoverable through the AER approved public lighting pricing model.

The decision to accept or reject ownership of a new asset is at the sole discretion of Essential Energy. Notification of Essential Energy's decision will be provided at the time of application.

Where Essential Energy does not accept ownership of an installation, the customer must arrange for the installation of an appropriate service connection point in accordance with the Service and Installation Rules of NSW and relevant Australian Standard (currently AS/NZS 3000:2018 - Electrical installations (commonly known as the Australian/New Zealand Wiring Rules). Essential Energy is not responsible for maintenance of installations that it does not own.

8.1 Mandatory illumination designs

Essential Energy requires Customers installing new public lighting on roundabouts or pedestrian crossings as defined under AS/NZS 1158.2:2020 to provide a compliant illumination design with the connection's application. This can be conducted by Councils or through an ASP Level 3.

8.2 Obtrusive light

Obtrusive light is caused by intense light sources designed to light the road reserve spilling through windows into residential living spaces. AS/NZS 4282:2023 – Control of the obtrusive effects of outdoor lighting, provides a common basis for the assessment of the likely effects of developments that involve the provision of outdoor lighting. Limits have been included in the most recent version of the standard; however, these limits only apply if they are specifically requested by the relevant Road Authority. They are not required to be met to comply with AS/NZS 1158 for Category P or V roads.

Essential Energy selects luminaires based on compliance with AS/NZS 1158 across a range of model design scenarios typical of a different roadway geometries and lighting sub-categories. Whilst the luminaires installed meet the requirements of the lighting sub-category, there will be circumstances where residents feel that the light is obtrusive. In these cases, it is Road Authorities (i.e., Councils) responsibility to investigate the issue and submit a request to Essential Energy to address it.

There are several solutions that can be proposed to resolve these issues. Some solutions are:

- Installing a lower wattage luminaire
- Installing a glare shield
- Reducing the mounting height
- Changing the tilt angle
- Removing the light altogether

Applying any of these solutions may impact compliance to AS/NZS 1158. The Road Authority, need to understand and acknowledge this. Where the Road Authority makes a specific request to address obtrusive light complaints, Essential Energy cannot guarantee to maintain compliance with the roadway lighting design subcategory.

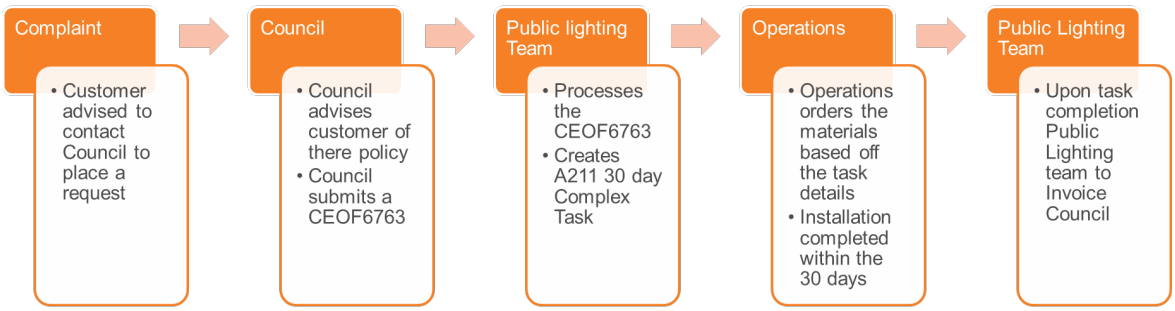
Work associated with addressing obtrusive light issues is excluded from regulated public lighting tariffs and is charged in line with the applicable Ancillary Network Service (ANS) Fees.

8.2.1 Glare shields

The most effective option to reduce obtrusive light, apart from removing the luminaire, is the use of a glare shield. These shields generally have a section which restricts light output at angles, usually from vertical 70 degrees upward. Restricting the output of the luminaire at these angles allows for the centre of the roadway reserve to continue to be illuminated whilst removing light that is often considered obtrusive. This however also removes light that may be illuminating the edges of the roadway reserve and creates black spots which would not meet the objectives of the lighting levels outlined in AS/NZS 1158 for Category P and V roadways. Each luminaire type has its own glare shield which attach to the LED module or luminaire.

In areas subject to vandalism, IK10 rated visors are available and can also be requested through this process.

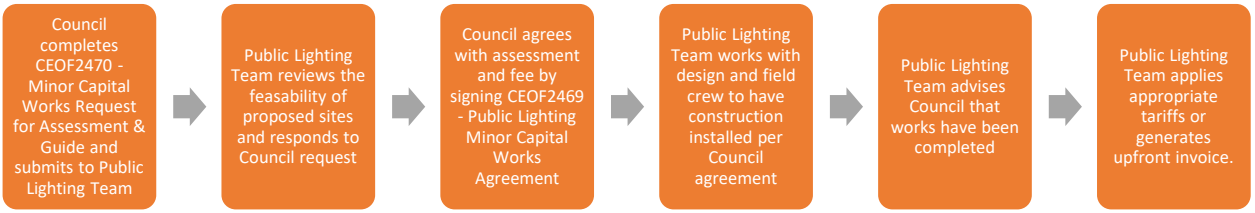
Where the Road Authority deems a glare shield is appropriate, they should complete a Glareshield agreement and follow the below process:



8.3 Minor Capital Works

Essential Energy has an obligation under The Code, to install up to 10 standard luminaires. This is defined as Minor Capital Works. These lights must be installed within 90 business days, or within a timeframe mutually agreed between Essential Energy and the Public Lighting Customer. This timeframe commences upon written approval of a quote by the Public Lighting Customer, and the Public Lighting Customer is to be notified within 20 business days of the completed works. Where Essential Energy expects that it will be unable to meet the required timeframes, the Customer is to be notified in writing as soon as practical and provide reasons for the delay.

The installation of more than 10 standard luminaires is allowable but will be exempt from the same performance conditions set out within The Code.



For further detail please refer to the Public lighting: Minor capital works request for assessment and guide and Public lighting: Minor capital works agreement.

Applications for Minor Capital Works are to be sent to Streetlighting@essentialenergy.com.au.

8.4 Upgrade Works

Upgrades of existing public lights with newer, more efficient technology is a normal part of Essential Energy's maintenance processes and is deemed non-contestable works. Where possible major upgrades occur where the public lighting asset reaches the end of its mechanical life as this is the most cost-effective method. However, customers can elect to undertake upgrades at any time by request in writing.

As the Public Lighting Customer is responsible for determining the lighting category (which determines the wattage requirements of the luminaire required to meet AS/NZS 1158 compliance), the Customer has the option to:

- Request Essential Energy to replace existing technology with luminaires on the AML on a 'like-for-like' basis. i.e., a luminaire that meets or exceeds the Light Technical Parameters specified in AS/NZS 1158 given the lighting subcategory, or
- Review the lighting category and provide a replacement schedule of standard luminaires to be installed by Essential Energy.

If the customer wishes to review the lighting category, Essential Energy recommends the customer engage an appropriately qualified designer (e.g., ASP Level 3) to undertake the illumination assessment and design.

Where upgrade work on non-standard equipment is required or requested, and where these works are deemed non contestable, Essential Energy may seek a contribution from the Customer for additional expenditure incurred but not included in the capital recovery pricing approved for standard installations by the AER.

9.0 PUBLIC LIGHTING MAINTENANCE

Maintenance of public lighting assets consists of planned and unplanned activities. The objective of these activities is to minimise total public lighting operational expenditure whilst maintaining lighting compliance and availability with requirements set out in The Code and AS/NZS 1158.

AS/NZS 1158.1.2 - Vehicular traffic – Guide to Design, Installation, Operation and Maintenance details activities that it recommends be adopted in a maintenance program. These are:

- Luminaire outage detection and service availability requirements
- Lamp replacement and disposal
- Luminaire cleaning and inspection
- Vegetation management
- Inspection, test, repair, and replacement of equipment (other than lamps and luminaires)
- Condition monitoring
- Inventory management
- Modification of maintenance program as required.

9.1 Luminaire Outage Detection

Outage detection is required such that service availability i.e., the number of lights operating, remains above 95% of the total population. Essential Energy uses the following means for detecting outages.

9.1.1 Night Patrols

Essential Energy conduct night patrols on all lights designed for Category V Roads on a periodic basis in line with CEOS5126.02. LEDs above 45W and non-LEDs above 125 watts are deemed Category V level lighting for the purposes of night patrols.

9.1.2 Customer Reporting

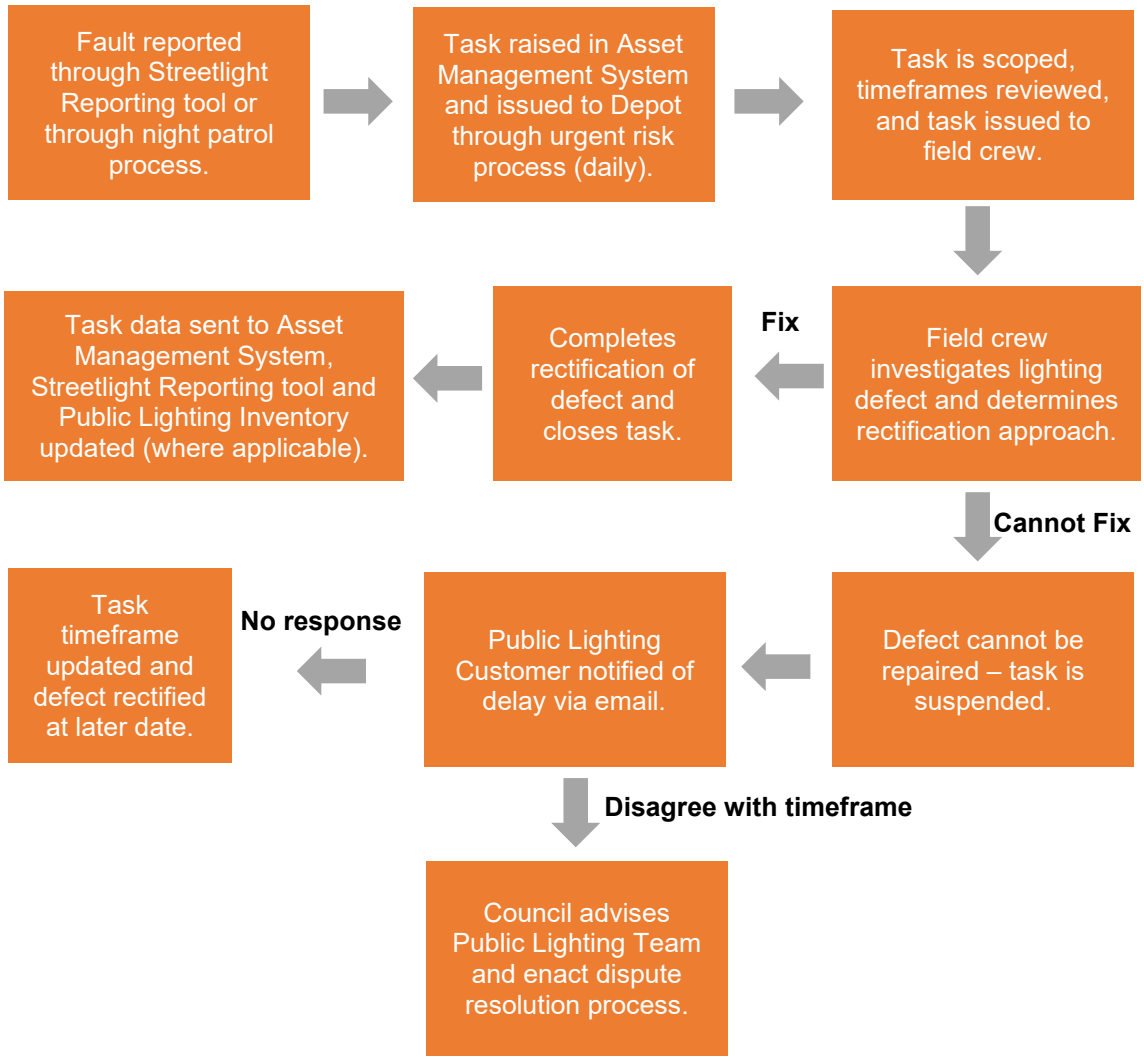
Essential Energy provides the following means for public lighting customers and the community to report streetlight faults:

- Online via the Streetlight Fault Reporting Tool - Report Streetlight Faults (essentialenergy.com.au)
- 24-hour supply interruption line – 13 20 80

9.2 Luminaire or Lamp Replacement and Disposal

9.2.1 Reactive Repair – Spot Replacement

Essential Energy provides repair of public luminaires including faulty globe/lamp replacement and supply faults in accordance with the standards set out in Schedule 1 of The Code, and the Public Lighting Fault process detailed in Maintenance Standard CEOS5126.02. The below diagram represents an overview of the Essential Energy fault repair process.



9.2.2.1 Delays in undertaking repairs

Where Essential Energy experiences a delay in undertaking repairs, as per the terms of The Code Schedule 1 - Table B – Excluded Fault Conditions, Column 1 (iii), Essential Energy will notify Customers via email to their nominated Public Lighting Representative of the expected delay timeframes. If no objection is received to this notification, then the delay timeframe notified will be deemed the permitted repair standard for the individual fault.

9.2.2.2 Force Majeure Events

Where Essential Energy deems compliance with service standards may be affected by a Force Majeure event under The Code:

1. Essential Energy will notify each affected customer via email to their respective Public Lighting Representative, as soon as reasonably possible, of the event. The email will outline:
    a. our intention to seek Force Majeure Event relief under The Code,
    b. the location of (and area affected by) the Force Majeure Event,
    c. the likely duration of the Force Majeure Event,
    d. an estimate of the period required to enable us to resume full performance of our obligations under the Code; and,
    e. if the Force Majeure Event is expected to last longer than 10 business days, our plans to manage any backlog of repairs and return to the Service Standards (including having regard to any Priority Fault).

2. Essential Energy will notify each affected customer via email that the Force Majeure Event has ended within 14 Business Days of the Force Majeure Event ending.
3. Details of any public lighting faults that were affected by the event will be contained in the Quarterly Performance Report.

9.2.2 Lamp Disposal

Essential Energy strives to minimise the impact of pollution, generated by our activities on the environment, by reducing wastes and by the recycling of wastes. We have made a commitment to recycle lighting lamps that contain mercury to prevent them from going to landfill and to protect human and environmental health.

This commitment has allowed Essential Energy to become a Signatory to the FluoroCycle Scheme (http://www.fluorocycle.org.au/index.php). The scheme gives public recognition to Signatories for their commitment to recycling.

Essential Energy's waste contractor provides boxes for the storage of lighting lamps for collection and recycling.

9.3 Luminaire Cleaning and Inspection

Essential Energy will inspect and clean LED luminaires every 6 years in line with AS/NZS 1158.6 - Section 2.9 to maintain compliant lighting levels.

9.4 Vegetation Management

Essential Energy's vegetation management program is designed to enhance public safety, support the delivery of safe and reliable power supplies, and educate customers on their responsibilities to clear vegetation beyond the immediate vicinity of luminaires.

Effective vegetation management will:

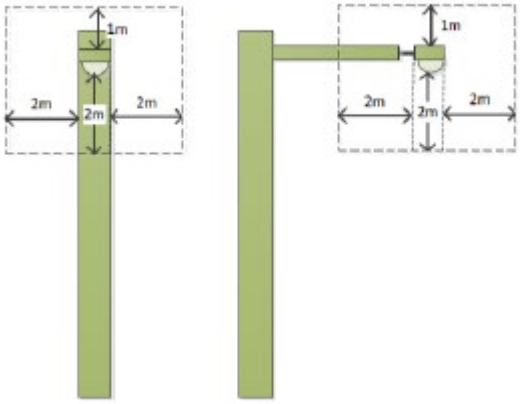
- Promote electrical safety and provide maintenance access – minimum clearances between electrical infrastructure and vegetation are required to allow ongoing maintenance and to promote public safety. This is detailed further in Essential Energy's Vegetation Management Plan (CEOP8008),
- Promote maximum light distribution – vegetation near luminaires can significantly compromise light distribution. AS/NZS 1158 recommends that a vegetation-free zone be maintained in the vicinity of luminaires.

Essential Energy accepts responsibility for keeping safe clearances between vegetation and overhead powerlines or public lighting on network poles (poles with overhead powerlines connected).

The responsibility for maintaining clearances greater than listed in CEOP8008 and for minimising the impact of vegetation on light distribution lies with the Customer. Several technical alternatives exist (such as installing longer brackets) that may assist if vegetation management is prohibitive due to preservation requirements or cost.

Customers can discuss these alternatives with Essential Energy's Public Lighting Service Provider Representative detailed in Section 4. Alterations will be funded by the Customer and may either be paid upfront or recovered through an appropriate Essential Energy tariff.

Essential Energy's vegetation management program extends to areas that are serviced by an underground power supply for the purpose of providing access for maintenance only. Where vegetation is obstructing light distribution on areas serviced by an underground power supply, the Public Lighting Customer will be responsible for removal of the vegetation. The below picture outlines the clearances required to maintain compliant lighting levels.



Essential Energy uses the following initiatives to meet its safety and maintenance responsibilities in relation to vegetation management.

- Safety and maintenance – Essential Energy informs vegetation contractors undertaking work on behalf of the business, of the required vegetation clearances around overhead luminaires and powerlines.
- Light distribution– Essential Energy informs customers of their responsibilities to clear vegetation beyond the immediate vicinity of luminaires through distribution of this management plan and Essential Energy's Vegetation Management Plan (CEOP8008).

9.5 Inspection, Test, Repair & Replacement of Equipment (other than lamps and luminaires)

The objective of Essential Energy's maintenance program is to ensure that the inspection, testing, repair, and replacement of equipment other than lamps and luminaires is undertaken appropriately.

Essential Energy undertakes the inspection and maintenance of brackets, some wiring, and supports in conjunction with luminaire inspection. Essential Energy has a program of support inspection and maintenance as well as a network wiring inspection and maintenance program described in CEOP8010 Electricity Network Asset Inspection, and CEOM7005 Asset Inspection Manual.

Structural safety inspections of streetlight columns are an important part of ensuring public safety and are undertaken on a cyclic basis. Essential Energy standards specify requirements to allow easy access to perform the inspection. Where access to perform the inspection is restricted due to the application of a permanent surface (e.g., concrete) the customer will be required to remove the permanent surface prior to works and suitably reinstate afterwards or pay an additional charge to cover Essential Energy's additional costs to undertake the inspection.

9.6 Condition Monitoring

Essential Energy uses a standardised Maintenance Requirements Analysis (MRA) process to develop preventative maintenance requirements by analysis and application of Failure Modes, Effects and Criticality Analysis (FMECA).

The FMECA analysis for public lighting is used to define scheduled luminaire or lamp replacement periods as well as maintenance periods for steel streetlight columns.

Essential Energy will:

- Adopt a bulk lamp or luminaire replacement interval which takes account of common industry practice, manufacturers' data, and FMECA maintenance analysis.
- Review data capture processes to ensure that data captured during maintenance meets the requirements of maintenance analysis.

- Modify equipment selection and procurement practices in line with maintenance analysis; and
- From time to time, as identified through field data or other sources of information, examine, and replace or repair specific fittings that might lead to unacceptable failure rates.

In keeping with the practices outlined in Australian Standard AS/NZS 1158.1.2, Essential Energy undertakes that its record keeping, reporting related to equipment populations and equipment failures shall be sufficient to evaluate and optimise equipment selection and cyclic maintenance intervals.

9.7 Public Lighting Inventory Management

9.7.1 Public Lighting Inventory

Essential Energy has developed and will maintain an inventory list of Public Lighting Assets for each Customer in accordance with The Code. The Public Lighting Inventory will record the following details for each Public Lighting Asset:

- The vicinity and GIS coordinates of a luminaire;
- Luminaire type, install date (where the asset was installed after 1 January 2006), NEM load per the AEMO Unmetered Load table, control method (primarily PE cell) and funding arrangement;
- Bracket install date (where the asset was installed after 1 January 2006), funding arrangement, the column/pole and luminaire it is attached to and lighting classification (Cat V or Cat P) which drives the tariff applied; and
- Column/pole type, material, height, install date (where the asset was installed after 1 January 2006) and funding arrangement.

A current Public Lighting Inventory is provided to each customer monthly.

9.7.2 Inventory queries

If Essential Energy receives written notice from a Customer of a query in relation to the Public Lighting Inventory for that Customer, Essential Energy will investigate the query and report back to the Customer within 20 Business Days.

9.7.3 Overcharges

If Essential Energy has overcharged or undercharged a Customer for a Monthly Billing Period (as documented in the Public Lighting Inventory), Essential Energy will assess the amount payable and make every effort to come to an agreement with the Customer regarding the refund or payable amount. The Customer's account will be credited or charged within 45 business days, or as otherwise agreed with the Customer. If the amount is not credited within 45 business days or within the agreed timeframe, Essential Energy will provide the refund by the end of the next Monthly Billing Period, unless otherwise agreed by the Customer.

9.7.4 Inventory changes and verification

Essential Energy takes reasonable steps to ensure that the Public Lighting Inventory is accurate and complies with the requirements of The Code including but not limited to:

- Regular data quality checks and cleansing;
- Automated data transfer from field to Asset Management System to reduce manual errors;
- Billing system error reports where inaccurate billing combinations have been entered;
- Closed loop feedback where issues are identified with internal teams;
- Creating and following documented policies and procedures for maintaining Public Lighting Inventory data.

Essential Energy will audit the Public Lighting Inventory data that impacts billing outcomes for Customers throughout the year. Essential Energy validates data impacting billing outcomes

through our defect rectification process in line with section 12.5 of the Metrology Procedure: Part A published by AEMO under rule 7.16 of the National Electricity Rules.

Essential Energy has implemented and will maintain a documented process for making changes or updates to its Public Lighting Inventory. This documented process is available to Customers upon request.

9.8 Modification of Maintenance Program as Required

It may be necessary and advantageous to modify the maintenance program because of condition monitoring, performance review, customer feedback, maintenance audits or technological advances. The objective in continuously seeking opportunities to optimise the maintenance program is to improve technical performance, efficiency, and productivity, reduce costs and enhance service for customers.

10.0 INFORMATION PROVISION AND REPORTING

Essential Energy will provide performance reporting to its Public Lighting customers and IPART on a quarterly and annual basis per The Code.

Essential Energy will provide the following reports monthly as part of SLUoS billing:

- A Customer billing report per National Meter Identifier (NMI) for the month. This report provides the total capital and maintenance charges (SLUoS) by lighting component.
- A Customer billing detailed report per National Meter Identifier (NMI) for the month. This report provides a breakdown of capital and maintenance costs per lighting component combination by each town and summarises additions and removals for the month.
- IR07 Customer Asset Inventory which provides the current inventory for the Customer as at 1st of the month. This report includes both assets owned by Essential Energy and assets owned and maintained by the Customer. This may include metered lights Essential Energy are aware of for passing on defects (no charges apply to these) and private lights which only energy consumption charges are billed (Network Use of System - NUoS).

An instruction document for interpreting the billing reports will be provided when the Public Lighting Representative changes or upon request.

In addition, Essential Energy and its customers may agree on supplementary reporting for the purposes of evaluating Code compliance.

11.0 PRICING

Essential Energy maintains a price list of all public lighting component charges on its website at https://www.essentialenergy.com.au/our-network/network-pricing-and-regulatory-reporting/network-pricing.

Pricing is set by the AER and is subject to review every 5 years. Where new similar components are introduced during the 5-year period, Essential Energy will price these components based on existing methodology and undertake consultation with public lighting customers before any new charges are introduced. A new component does not include where a supplier changes the wattage or model of their component.

Where new public lighting equipment is introduced which is dissimilar to the equipment approved in pricing under the regulatory period, Essential Energy will provide this equipment or service as a quoted service under the AER framework.

11.1 Capital and Maintenance Cost Recovery

Essential Energy introduced component-based pricing from 1 July 2019. This means that charges are constructed from individual public lighting components (luminaire, bracket, and support) and who funded their installation. Components that are funded by Essential Energy incur a charge to

recover the capital expenditure as well as a charge to recover the ongoing maintenance. Components that are funded by the customer only incur maintenance charges.

Maintenance charges are recovered by Essential Energy at the efficient expenditure rate set by the AER. Maintenance at a high level allows for Essential Energy to recover the expenditure for planned and unplanned maintenance such as night patrols, cleaning/inspection and spot replacement or failed components.

11.1.1 Tariff Structures

Funded by:	Description	OPEX	CAPEX
Essential Energy	The installation of a component is paid for by Essential Energy and recovered through a tariff. Essential Energy maintains the component.	✓	✓
Customer	The installation of a component is paid upfront by the Customer and either installed by Essential Energy or an ASP and then handed over to Essential Energy to maintain. Essential Energy maintains the component.	✓	✗
Customer Pre-2009	Tariff 2 applicable from the prior tariff structure where Councils paid upfront for the capital cost of the next replacement of the luminaire. This is no longer offered to Customers. Essential Energy maintains the component.	✓	✗
Private	The installation of a component is paid, installed and maintained by the Customer. This asset is direct connected to the unmetered network and as such Essential Energy must be informed of the asset information but does not maintain the component.	✗	✗

11.1.2 Inputs to componentised SLUoS billing

Luminaire

- Installation date (effective date) – capital recovery occurs over 10 years
- Funding arrangement (funding by)
- Luminaire type (PL Table Code)

Bracket

- Installation date (effective date) – capital recovery occurs over 35 years
- Funding arrangement (funding by)
- Road category V or P (lighting classification)

NOTE: Essential Energy does not charge a maintenance (OPEX) tariff for brackets and allocates a capital charge based on the road category i.e., whether a bracket has been installed for a luminaire on a Category V (main road) vs a Category P (residential/public area).

Support

- Installation date (effective date) – capital recovery occurs over 35 years
- Funding arrangement (funding by)
- Pole material
- Pole height
- Whether the pole is a network pole or dedicated column (dedicated support type) – Essential Energy does not charge a fee for lighting installed on a network pole.
- How many lights are on the pole or column – Essential Energy only charges the support maintenance (OPEX) and/or capital (CAPEX) for the first light on the pole/column.

12.0 DISPUTE RESOLUTION

Essential Energy encourages Councils to escalate any concerns in the first instance to our Head of Strategic Council Partnerships. If a matter cannot be resolved through this escalation point Essential Energy has a complaint and dispute procedure that aligns with the Australian Standard IOS 10002:2014, that aligns to the requirements under The Code. General External (essentialenergy.com.au).

13.0 DEFINITIONS

Abbreviation	Description
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AML	Approved Material List
ANS	Ancillary Network Service
ANSI	American National Standards Institute
AS/NZS	Australian Standard/New Zealand Standard
ASP	Accredited Service Provider
BLR	Bulk Lamp Replacement
CAPEX	Capital Expenditure
EWP	Elevated Work Platform
FMECA	Failure Modes, Effects and Criticality Analysis
GIS	Geographic Information System
HID	High-Intensity Discharge

IK	Impact Protection
ISSC	Industry Safety Steering Committee
LED	Light Emitted Diode
Metrology Procedures	AEMO – Metrology Procedure: Part A: National Electricity Market
MRA	Maintenance Requirements Analysis
NEM	National Electricity Market
NEMA	National Electrical Manufacturers Association
NSW	New South Wales
OPEX	Operational Expenditure
PL	Public Lighting
ROL	Road Occupancy License
SLUoS	Streetlight Use of System
TS	Technical Specification
The Plan	Public Lighting Management Plan
The Code	NSW Treasury – Office of Energy and Climate Change's NSW Public Lighting Code 2023.

14.0 REVISIONS

Issue No.	Section	Details of changes in this revision	Date of Revision
3	All	Re-write.	
4	All	Template/logo change.	
5	All	Annual review and update.	
6	All	Review to align with Public Lighting Code 2019.	March 2019
7	All	Review to align with Public Lighting Code 2021.	November 2021
8	All	Review to align with Public Lighting Code 2021.	October 2022

9	7.4	Addition of vegetation management picture.	November 2022
10	All	Review to align with Public Lighting Code 2023 and clarify tariff structures.	October 2023
11	All	Amend October 2023 updates to consider feedback from Customers.	May 2024