

# PUBLIC LIGHTING MANAGEMENT PLAN

Issue 4

September 2016



Endeavour  
Energy

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## Table of contents

<b>1.0</b>	<b>Overview .....</b>	<b>5</b>
<b>2.0</b>	<b>Introduction .....</b>	<b>6</b>
2.1	Purpose .....	6
2.2	Scope .....	6
2.3	Compliance with codes and standards .....	6
2.4	Stakeholder liaison .....	7
2.5	Availability of this plan .....	7
2.6	Public Lighting services .....	7
2.7	Our franchise area .....	8
2.8	Nominated representatives .....	9
<b>3.0</b>	<b>Design and construction .....</b>	<b>9</b>
3.1	Connection criteria for new Public Lighting assets .....	9
3.2	Contestability and funding provisions for Public Lighting projects .....	10
3.2.1	<i>Capital works, Minor, Moderate and Major classifications .....</i>	<i>10</i>
3.2.1.1	<i>Minor Capital Works .....</i>	<i>10</i>
3.2.1.2	<i>Moderate Capital Works .....</i>	<i>10</i>
3.2.1.3	<i>Major Capital Works .....</i>	<i>11</i>
3.3	Tenure arrangements and easements or legal equivalent .....	11
3.4	Relocation works .....	11
3.5	Developments not considered Public Lighting .....	11
3.6	Strata title development .....	11
3.7	Upgrade of upstream network (headworks) .....	11
3.8	Design of Public Lighting (Contestable and non-contestable projects) .....	12
3.8.1	<i>Minimum design requirements .....</i>	<i>12</i>
3.8.2	<i>Design brief .....</i>	<i>13</i>
3.8.3	<i>Communication .....</i>	<i>13</i>
3.9	Removal of Endeavour Energy funded assets .....	13
3.10	Data update .....	13
3.11	Glare complaints .....	14
<b>4.0</b>	<b>Maintenance .....</b>	<b>14</b>
4.1	Planned maintenance .....	14
4.2	Unplanned maintenance .....	14
4.2.1	<i>Repair response times .....</i>	<i>15</i>
4.3	Condition based maintenance (CBM) .....	15
4.4	Patrols .....	15
4.5	Vegetation management .....	16
4.5.1	<i>Where electricity is supplied by overhead mains .....</i>	<i>16</i>
4.5.2	<i>Where electricity is supplied by underground mains .....</i>	<i>16</i>
4.6	Vandalism .....	16

4.7	Lamp disposal .....	16
<b>5.0</b>	<b>Standard equipment.....</b>	<b>17</b>
5.1	Energy-efficient luminaires.....	17
5.2	Introduction of new equipment.....	17
5.3	Replacement of luminaires no longer supported .....	18
5.4	Painted columns .....	19
<b>6.0</b>	<b>Administrative.....</b>	<b>20</b>
6.1	Asset reports .....	20
6.1.1	Inventory reports .....	20
6.1.2	GIS reports.....	20
6.2	Call Centre .....	20
6.3	Customer Service Guarantees.....	20
<b>7.0</b>	<b>Commercial.....</b>	<b>21</b>
7.1	Funding .....	21
7.2	Pricing .....	21
7.2.1	Legacy rates – Tariff Class 1 and 2 .....	21
7.2.2	Annuity rates – Tariff Class 3 and 4.....	21
7.2.3	Residual capital value – Tariff class 5 .....	22
7.2.4	Maintenance only rates – Unregulated Tariff Class 6 .....	22
7.3	Billing of Public Lighting services .....	22
<b>8.0</b>	<b>Systems.....</b>	<b>23</b>
<b>9.0</b>	<b>Service Level Agreements .....</b>	<b>23</b>
<b>10.0</b>	<b>Public Lighting Management Plan .....</b>	<b>24</b>
10.1	Endeavour Energy’s role.....	24
10.2	Role of Public Lighting Customers .....	25
<b>11.0</b>	<b>Performance reporting .....</b>	<b>25</b>
<b>12.0</b>	<b>Dispute resolution .....</b>	<b>26</b>
<b>13.0</b>	<b>Definitions.....</b>	<b>27</b>
<b>Annexure 1.....</b>		<b>29</b>
<b>Annexure 2.....</b>		<b>30</b>



## 1.0 Overview

Endeavour Energy is the second largest energy corporation in New South Wales with a proud 55 year history powering some of Australia's largest and fastest growing regional economies.

Endeavour Energy distributes and provides power to approximately 900,000 customers, or 2.2 million people, in households and businesses across a network franchise spanning 24,808 square kilometres in Greater Western Sydney, the Illawarra, the Blue Mountains and the Southern Highlands.

Illumination on residential streets, main roads, pedestrian crossings and pathways is provided by approximately 200,000 streetlights connected to the network, which are operated and managed on behalf of 29 Public Lighting Customers, including 23 local councils.

As a Public Lighting Service Provider, Endeavour Energy recognises that well designed, maintained and managed Public Lighting offers a safe, secure and attractive visual environment for pedestrians and drivers during times of inadequate natural light.

The NSW Public Lighting Code, January 2006 (Code) has provided Endeavour Energy with an opportunity to work closely with its customers to maintain and improve Public Lighting services.

Endeavour Energy is committed to providing a level of service that meets the requirements of the Code within the framework approved by the Australian Energy Regulator (AER). As an endorsement of our commitment, this Public Lighting Management Plan (PLMP) has been developed to provide an overview of the business structure, processes and decision support systems Endeavour Energy has in place to manage and operate a safe and reliable Public Lighting network.

It also provides an overview of strategies Endeavour Energy has put in place for continuous improvement in the standard of Public Lighting services provided to the customers.

Endeavour Energy's focus is on providing a safe and reliable electricity supply and Public Lighting services to our customers and, in doing so, delivering ongoing excellence in customer service. This plan is a further endorsement of that commitment and our undertaking to our Public Lighting Customers in respect of compliance with the Code.

## 2.0 Introduction

### 2.1 Purpose

Endeavour Energy is committed to the application of best practice asset management strategies to monitor the safe and reliable operation of its electricity network, which includes Public Lighting, and to giving safety the highest priority over all other aspects of network management.

This plan outlines how Endeavour Energy will provide and manage a safe and reliable Public Lighting network on behalf of its Public Lighting Customers, in line with the requirements of the Code.

The Code does not apply to community title developments and their management associations or developers, private roads, and other private precincts as well as *Nightwatch* (security and promotional lighting generally provided to commercial and industrial customers within the franchise area on agreement) customers. Community title developments and *Nightwatch* customers may be accepted for connection if they meet Endeavour Energy's minimum requirements and after signing and acceptance of agreements with Endeavour Energy, as they fall outside the definition of Public Lighting Customers.

### 2.2 Scope

This plan has been developed to align with the regulatory period 2014 to 2019, set by the Australian Energy Regulator (AER). In accordance with the Code, this plan covers the following areas:

- Endeavour Energy's strategy for operation, maintenance, refurbishment, replacement, repair and disposal of Public Lighting assets.
- Endeavour Energy's customer liaison process for the development of this document.
- Other performance requirements that may be set out in Service Level Agreements with customers.
- Endeavour Energy's responsibilities as set out in section 10.1 of this document.
- Public Lighting Customer responsibilities to enable Endeavour Energy to provide a safe and reliable service, as set out in section 10.2 of this document.

### 2.3 Compliance with codes and standards

Endeavour Energy will adhere to the following standards and codes when installing and maintaining Public Lighting:

- NSW Public Lighting Code January 2006 (Code).
- Customer nominated requirements within the range of services offered.
- AS/NZS 1158 series of standards pertaining to the lighting of roads and public places
- *Electricity Supply Act* 1995.
- Endeavour Energy Electrical Safety Rules.
- Endeavour Energy Company Policy 9.2.13 – Property tenure for network assets.
- Endeavour Energy Company Policy 9.6.8 – Public Lighting.
- Endeavour Energy General Terms and Conditions for connection of Public Lighting assets.

Endeavour Energy will continue to apply safety rules and regulatory guidelines, Australian standards to design and construct Public Lighting installations in accordance with its *General Terms and Conditions (GT&C)*, and the customer's complying requirements.

Public Lighting Customers are responsible for the environment in which lighting schemes are installed and should be mindful of the impact the environment has upon lighting. If

the environment is subsequently altered (for example, by trees or vegetation planted subsequent to the installation, or by vandalism, or other means), Endeavour Energy cannot warrant that the installation will still comply with the customer's initial nominated design standard.

#### **2.4 Stakeholder liaison**

This management plan has been revised following the submission of a draft to each Council for comment and consideration of their feedback.

The plan provides for the nomination of a designated liaison representative to act as the primary point of contact between Endeavour Energy and its customers for specific Public Lighting services provided by both parties (a reciprocal arrangement). As well, Endeavour Energy has established regional contacts for design, construction and maintenance, and for vegetation management inquiries from customers.

Details of the primary point of contact, and a list of regional contacts, are set out in Annexure 1.

#### **2.5 Availability of this plan**

This plan is available on the Endeavour Energy website:

[www.endeavourenergy.com.au](http://www.endeavourenergy.com.au)

#### **2.6 Public Lighting services**

Endeavour Energy provides Public Lighting services that include illumination for town and business centres, shopping precincts, main roads, suburban and rural streets, as well as defence installations, ports and water services.

Endeavour Energy offers a range of lighting solutions for these customers, which vary depending on the specific lighting requirements, environmental considerations, costs, aesthetics and other relevant factors. These Public Lighting arrangements have evolved over a long period of time to specific customer needs and changes in technology. Demand for Public Lighting services has grown at a rate of about 2.5% (average) each year in the period 2009-14.

## 2.7 Our franchise area

Endeavour Energy's network area covers 24,808 square kilometres throughout some of the fastest growing regions of Australia, including Sydney's Greater West, the Southern Highlands and the Illawarra. A map of our franchise area, showing Endeavour Energy's three regions is set out below.





## **2.8 Nominated representatives**

Endeavour Energy's primary contact with complete details is given in Annexure 1. It is recommended that each Public Lighting Customer nominate a representative for liaising.

## **3.0 Design and construction**

### **3.1 Connection criteria for new Public Lighting assets**

Endeavour Energy will only accept Public Lighting assets that are designed and constructed to Endeavour Energy's standards using Endeavour Energy's nominated standard equipment. Additionally suitable tenure over the asset location, inclusive of site access and electrical supply infrastructure location is required to Endeavour Energy's requirements. Ongoing responsibility for maintenance and renewal of such Public Lighting assets will be vested in Endeavour Energy.

With respect to tenure for assets, access routes and supply infrastructure the following scenarios are acceptable:

- Dedicated Public Roadway;
- Designated Public Lighting Customer owned land where easements have been established in favour of Endeavour Energy for the prescribed use.

With respect to access arrangements:

- the new lighting assets must be accessible using an Elevating Work Platform (EWP); and,
- hinged columns are to be installed for lighting in pathways and laneways without EWP access. Hinged columns are to be located within 100m (nominally) of the EWP access. Endeavour Energy will continue to maintain existing pathway and laneway lights provided Public Lighting Customers maintain existing accessibility arrangements to their current standard. Additional access constraints applied to existing lighting may result in Endeavour Energy no longer maintaining the asset or applying an additional constrained access charge to Customers.

Endeavour Energy will not accept Public Lighting installation where the above conditions are not met. In situations where Endeavour Energy is unable to take over ownership and maintenance of a new Public Lighting 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 the relevant Australian standard (currently the *AS/NZS 3000:2007 – Electrical Installations*, known as the *Australian/New Zealand Wiring Rules*) and will remain the responsible owner of the installation.

## **3.2 Contestability and funding provisions for Public Lighting projects**

### **3.2.1 Capital works, Minor, Moderate and Major classifications**

Capital works projects are classified as either minor or major as set out in the definitions below.

#### **3.2.1.1 Minor Capital Works**

Where the Customer requests (Minor Capital Works) infill lighting or other minor additions or alterations to existing Public Lighting Assets of less than or equal to seven luminaires, these works are deemed Non-Contestable. Endeavour Energy will install, operate and maintain on fair and reasonable terms any new Public Lighting Assets or alterations to existing Public Lighting Assets where:

- a) the lighting is to be mounted on the Endeavour Energy's existing electricity distribution poles;
- b) the distribution poles are supplied with overhead wiring; and
- c) standard luminaires are specified and are to be installed in accordance with relevant network standards.

For such installations Endeavour Energy will:

- a) provide design services in a timely fashion being not more than 30 days from the date of a written request by a Customer;
- b) provide construction services in a timely fashion being not more than 120 days from the date of receipt of a signed Notification of Change in Charges (NOCC) letter;
- c) provide notice to Customers of completion of works within 30 days of completion of works; and
- d) update the Public Lighting inventory within 90 days of completion of works.

Where Endeavour Energy cannot meet these timeframes, it will notify the Customer of the expected delay and give reasons as to why delays are expected in relation to a particular work.

#### **3.2.1.2 Moderate Capital Works**

The timeframes indicated for completion of design and construction of minor capital works in section 3.2.1.1 will apply where up to five (5) customer requests are received each calendar month. Where a Public Lighting Customer forwards a list of projects, or requests more than five (5) projects in a calendar month, those projects will be treated as Moderate Capital Works and are deemed Non-Contestable.

On receipt of duly completed design briefs from the Public Lighting Customer, Endeavour Energy will meet the following timeframes:

- a) Endeavour Energy will start negotiations for project completion dates with the customer within a period of 30 days.
- b) The time frame for completion of an engineering design will be negotiated with the Public Lighting Customer. Any anticipated delay/s in the negotiated timeframe will be communicated beforehand to the customer, together with the reason/s for the delay.
- c) Construction activities will be completed to a timetable negotiated with the Public Lighting Customer. Endeavour Energy will commence construction only after Notification of Change in Charges (NOCC) is accepted by the Public Lighting Customer and a signed copy is returned. Any anticipated delay/s in the timeframe will be communicated beforehand to the customer together with the reason/s for the delay/s.

### **3.2.1.3 Major Capital Works**

Projects not defined as Minor Capital Works or Moderate Capital Works are classified as Major Capital Works and deemed contestable.

Public Lighting Customer submissions where larger projects are broken into minor capital works are deemed as Major Capital Works.

### **3.3 Tenure arrangements and easements or legal equivalent**

New Public Lighting assets must not be installed unless:

- the lighting assets will be on dedicated public roadway or an easement benefiting Endeavour Energy or legally equivalent status has been granted to Endeavour Energy; and
- the Public Lighting Customer has accepted Endeavour Energy's Public Lighting general terms and conditions, or a legacy agreement exists.

For Public Lighting assets that are not on dedicated public roadway, the Public Lighting Customer must establish an easement or legal equivalents in Endeavour Energy's favour.

The easement must cover all ancillary supply cables and equipment associated with the physical and electrical support of the lighting assets.

The easement area must be sufficient to allow Endeavour Energy's standard plant and equipment to gain access and to operate for the purposes of construction and maintenance of the Public Lighting assets. Public Lighting Customers must monitor that they do not permit erection of any obstruction or barricades on the easement without Endeavour Energy's written approval.

### **3.4 Relocation works**

Projects for moving existing Public Lighting assets are relocation works. A roundabout with existing road lighting that will need to be moved for widening of the roundabout is an example of asset relocation works. All asset relocation works are deemed as contestable works.

### **3.5 Developments not considered Public Lighting**

Lighting in the following new developments is not considered as Public Lighting:

- Public toilets
- Bus shelters
- Illuminated street signs and
- Ancillary street furniture lighting

### **3.6 Strata title development**

Street Lights under these types of development will generally not be connected to the Public Lighting system and will not be maintained by Endeavour Energy unless there is an agreement with the Public Lighting Customer to the contrary. Where the assets within the development are not owned by Endeavour Energy, the connection to these luminaries will be fed through a metered supply from a small service connection point.

### **3.7 Upgrade of upstream network (headworks)**

Public Lighting works resulting from upstream upgrades of the power supply network will be funded by Endeavour Energy. Typically these projects involve the undergrounding of the local Network.

Works for augmentation or upgrade of the upstream network are undertaken by either the Company, or third parties through Accredited Service Providers (ASPs), such as developers in case of new sub-divisions, or new Public Lighting Customers requiring electricity supply connection, or existing Public Lighting Customers requiring network augmentation for connection of additional electrical loads.

Where the Company is the proponent, the Company will forward a written communication of such supply network upgrade projects to the Public Lighting Customer. In such instances, the existing lighting design will not be materially altered in any manner without express agreement from the Public Lighting Customer, other than the substitution to current standard luminaires.

Where a Public Lighting Customer requests an upgrade of a lighting installation including addition, removal or renewal of luminaires at the time of upstream supply network upgrades, a fully completed design brief is required before undertaking work.

Tariff class 3 charges will be applied where the Company provides the funding. Tariff Class 5 applies for lighting assets removed or replaced at the request of Public Lighting Customer. In such a situation the capital funding is provided by the Public Lighting Customer. Tariff Class 4 charges will be applied to the new / upgraded assets for maintenance.

Where parties other than the Company are undertaking contestable works that involves changes to the existing Public Lighting, they will be required to seek the approval of the Public Lighting Customer. All contestable works require design certification by the Company. The change may involve one off payment of the replacement of existing asset before the end of its economic life (Tariff Class 5). Using the Australian Energy Regulator's approved method, the charge is calculated using the replaced asset's weighted average remaining life. The charge is paid at the time of replacement by the Public Lighting Customer or their nominated party.

Different scenarios of change / upgrade are explained in Annexure 2.

It is anticipated that the Public Lighting Customers will work collaboratively with Endeavour Energy on such matters and accept any changes in charges and quantity of lighting resulting from these head-works. Where Public Lighting Customers are not willing to accept any changes, Endeavour Energy will complete the supply network upgrade without any changes to the Public Lighting. It is a requirement that Public Lighting Customers provide written notice to Endeavour Energy formally stating that they do not wish underground upgrades of the Network to proceed in association with Endeavour Energy's augmentation and renewal of the Network if they do not wish for this arrangement to proceed.

### **3.8 Design of Public Lighting (Contestable and non-contestable projects)**

#### **3.8.1 Minimum design requirements**

Non Contestable Projects: Public Lighting Customers make all decisions regarding the requirement and level of road lighting in public spaces and outdoor areas within their local government area, or on main roads maintained by RMS or other similar customers. As a Public Lighting service provider, Endeavour Energy designs and constructs Public Lighting in accordance with the specification/s given in the design brief completed by a Public Lighting Customer.

A Public Lighting Customer may nominate lighting category P (where visual requirements of pedestrians are dominant) or lighting category V (where visual requirements of

motorists are dominant), conforming to AS/NZS1158 series of Road Lighting Standards, in the design brief. Alternatively, a Public Lighting Customer may nominate specific lighting requirements that are outside the P or V category levels set out in AS/NZS1158.

**Contestable Projects:** Here also the Public Lighting Customers make all decisions regarding the requirement and level of road lighting in public spaces and outdoor areas within their local government area, or on main roads maintained by RMS or other similar customers. The project is designed and constructed by the Public Lighting Customer appointed ASP.

### **3.8.2 Design brief**

A Public Lighting Customer must provide a completed design brief in accordance with the Public Lighting standards for design and construction of new Public Lighting assets. The design brief shall include all necessary information for design of the new (or altered, or replaced) Public Lighting assets. The information provided shall be clear and acceptable so as to clearly set out the lighting level required and the location of the project.

The design brief form is available in The General terms and Conditions for connecting to Public Lighting assets which can be downloaded from the website at:

[www.endeavourenergy.com.au](http://www.endeavourenergy.com.au)

### **3.8.3 Communication**

On receipt of a duly completed and acceptable design brief from the Public Lighting Customer, Endeavour Energy will assign a reference number to each lighting project, and communicate this number to the Public Lighting Customer, to be quoted in all communication between the parties.

## **3.9 Removal of Endeavour Energy funded assets**

Endeavour Energy will recover the residual value of any Public Lighting asset/s as a result of customer requests to:

- Relocate assets.
- Modify or upgrade assets.
- De-energise assets.

If Tariff Class 5 applies (refer to section 7.2.3 for details), Endeavour Energy will commence work on a new project only after the residual charges and new tariffs applicable to the project have been accepted by the Public Lighting Customer. For contestable works projects, a design submitted by an ASP will be certified only after the residual payment obligation and new tariff charges have been accepted by the Public Lighting Customer.

## **3.10 Data update**

For minor, moderate and major capital work projects, 'Work as Executed' drawings are to be submitted to Endeavour Energy within ten (10) business days of construction. Endeavour Energy's records, including details of billing, will be updated to reflect the lighting adjustments within ten (10) business days after the assets are energised.

Billing of new assets commences from the day the data is entered into the Public Lighting asset register.



### **3.11 Glare complaints**

Where, following an investigation, a Public Lighting installation is found in accordance with the customer's design brief, the resident is advised to contact the Public Lighting Customer.

Public Lighting Customer may contact Endeavour Energy for advice to address the glare complaint. The customer will need to send a written request for a quotation for glare control. Endeavour Energy will submit a quotation indicating proposed option/s for reduction of glare.

In cases where the Public Lighting installation is not in accordance with the customer's design brief, corrective action is taken by Endeavour Energy.

Fitting of fully cut-off luminaires to minimise glare on Public Lighting installations that are not designed for their use can create a major variation from AS/NZS 1158. Endeavour Energy will install fully cut-off luminaires only on installations that have been designed for the purpose. Also, installation of fully cut-off luminaires is recommended only in environmentally sensitive areas due to their limitations of light output.

Fitting of internal or external shields or other such glare reducing measures interferes with the light distribution to a degree that compliance with the Public Lighting standards is negated. Endeavour Energy will fit a shield or any other measures requested by the Public Lighting Customer where the customer expressly recognises and acknowledges their intention to vary compliance with the standard by requesting such measures. All costs associated with the installation of *Aeroscreen* (full cut-off) luminaires or other glare control measures shall be borne by the Public Lighting Customer.

## **4.0 Maintenance**

Endeavour Energy's Public Lighting maintenance regime falls into three categories: planned; unplanned; and condition based.

Endeavour Energy believes that a right balance between planned and condition based maintenance drives down the incidence of faults and hence the need for unplanned maintenance (random repairs) whilst improving Public Lighting reliability and making best use of resources. Endeavour Energy is thus able to provide a cost effective Public Lighting service to its customers.

### **4.1 Planned maintenance**

Speed and level of lighting degradation over time is critical for establishing the replacement life cycles of lamps for public safety. Currently Endeavour Energy carries out bulk lamp replacement with a three year rolling program for all lamps except High Pressure Sodium lamps in wattages of 150, 250 and 400 where it is four years. Additionally the cleaning cycle of the optical chamber of LED luminaires is currently six years. These time frames are deemed to be the optimum cycle for the styles and types of luminaires used throughout the network franchise area.

Following bulk lamp replacement, luminaires are tested to establish they are in working condition. Any changes found in the field during bulk lamp replacement are noted and updated in Endeavour Energy's asset register.

### **4.2 Unplanned maintenance**

Unplanned maintenance covers fault and emergency response (also called random repairs). All public and Public Lighting Customer telephone calls regarding faulty

streetlights are logged into the Outage Management System (OMS) database. Faulty streetlights can also be reported on:

- Endeavour Energy's website: all website reports are acknowledged with an e-mail response and are logged into the OMS. Endeavour Energy Outage app which can be downloaded free of cost. Street light outage can be reported under "Report Broken Street Light".

All components replacement are updated in Endeavour Energy's asset register.

#### **4.2.1 Repair response times**

Public Lighting Assets (excluding network supply faults) are repaired within twelve (12) business days from receipt of a fault report.

Where residents or Public Lighting Customers indicate that the faulty Public Lighting is in a priority location, such as a high crime area, areas with high night time activity, supplementary floodlights at pedestrian crossings, or groups of three (3) or more lights on *Category V* roads (as defined in the AS/NZS 1158 series of standards), Endeavour Energy makes all efforts to complete the repairs more quickly.

Longer response times may be unavoidable in the following circumstances:

- a) severe weather conditions, large-scale power outages, fire, natural disaster, acts of terrorism or war, public disobedience and high risk situations where public safety and the restoration of power to consumers receive priority; and
- b) where repairs are required in remote locations and the Public Lighting Customer has agreed with the longer response time to repair faulty Public Lighting

Endeavour Energy will notify and communicate with the Public Lighting Customer under the above circumstances and advise of the exclusion from the Code guarantee.

#### **4.3 Condition based maintenance (CBM)**

Based on, Endeavour Energy's maintenance policies and standards the Public Lighting network is maintained to achieve acceptable levels of safety, reliability and quality of supply while the impact on the environment commensurate with community, regulator and shareholder expectations, and in accordance with appropriate acts, regulations and codes.

Public Lighting equipment is being maintained at a level that will realise a serviceable life consistent with industry standards and defined business objectives. This includes condition based maintenance (CBM) that is carried out due to the performance or condition of the asset, where the restoration can be carried out in a scheduled manner, and includes:

##### **Underground assets:**

- Five (5) yearly external above and below ground line inspection of streetlight columns.
- Four (4) yearly external thermal inspection of streetlight columns.

##### **Overhead assets:** Overhead and ground line inspections (OLI/GLI)

- Routine pole and line inspections every 4.5 years, including Public Lighting circuit conductors.

#### **4.4 Patrols**

When crews repair a faulty street light reported by a resident or a Public Lighting Customer, they patrol the surrounding streets and areas to find any unreported street

lights that are faulty and also repair those lights. Whilst improving productivity of maintenance crews, this arrangement also assists in providing a cost-effective service to our Public Lighting Customers.

In order to identify other faulty lights on main roads that may not be reported by the residents or Public Lighting Customers, Endeavour Energy also performs programmed six-monthly patrols of major traffic routes and high public risk locations.

#### **4.5 Vegetation management**

In planning to achieve the objectives of Public Lighting, the spacing, spread and density of foliage and ground clearance of trees are important factors affecting the selection of installation geometry and luminaire performance. Conversely, in new plantings, the type and location of trees should be considered in relation to the lighting requirements. In addition, consideration should be given to the problems of seasonal change, and growth between trimming periods.

As road managers, Public Lighting Customers are responsible for specification, culture and trimming of trees in public areas. It is therefore important that the above factors are considered by the Public Lighting Customers when determining their vegetation management policy.

##### **4.5.1 Where electricity is supplied by overhead mains**

Vegetation is cleared to allow a minimum of two (2) metres horizontal clearance from the head of a street lighting luminaire and extending in the vertical plane from 1000 mm above the luminaire to two (2) metres below the luminaire, as shown in the diagrams below.

The responsibility for maintaining clearances around streetlight luminaires in areas where electricity is supplied by overhead mains lies with Endeavour Energy.

##### **4.5.2 Where electricity is supplied by underground mains**

The responsibility for maintaining clearances around streetlight luminaires in areas where electricity is supplied by underground mains lies with the Public Lighting Customer.

Where access to a streetlight for repair and maintenance is constrained by vegetation around it, the Public Lighting Customer will be notified. If the vegetation is not trimmed within the requested time, Endeavour Energy will be unable to guarantee repair response time or service levels in accordance with the Code. In such situations, any public liability due to inadequate lighting will be completely borne by the Public Lighting Customer.

#### **4.6 Vandalism**

Endeavour Energy reserves the right to modify, remove, disconnect or transfer to maintenance only rates (unregulated tariff class) any Public Lighting installation that is subjected to repeated vandal attack. The customer will be advised and the options discussed prior to any action by Endeavour Energy.

#### **4.7 Lamp disposal**

Endeavour Energy is fully committed to conducting its operations in an environmentally sustainable manner and maintaining a safe environment by introducing processes, equipment and work practices that reduce the environmental footprint. All lamps replaced as a result of the bulk lamp change program, or fault and emergency repairs are recycled.

Street lighting crews bring all lamps to the Endeavour Energy depots, where they are transferred into a recycle bin and collected by a recycling service.

## **5.0 Standard equipment**

Endeavour Energy maintains a list of standard equipment that can be installed on its Public Lighting network. This list is available on the Endeavour Energy web site [www.endeavourenergy.com.au](http://www.endeavourenergy.com.au).

The variety and type of equipment that may be connected as Public Lighting is restricted for a number of reasons, primarily: Endeavour Energy is committed to repair all reported faults within the customer service guarantee period and, if a large variety of equipment is connected as Public Lighting, the ability to meet the guaranteed service level commitment in a cost effective manner would be seriously jeopardised.

Endeavour Energy will own and maintain new lighting installations that use standard columns, outreach arms, brackets or luminaires.

Where a customer wishes to own and maintain a new lighting installation using equipment that is not to Endeavour Energy's standard, the installation will be connected in accordance with the Service and Installation Rules of NSW and the relevant Australian standard (currently AS/NZS 3000: 2007 – Electrical Installations, known as the Australian/New Zealand Wiring Rules) through a metered supply.

For unmetered supply, Public Lighting Customers must install an isolation point for dedicated service connection of Public Lighting assets owned by them. Endeavour Energy will provide maintenance limited to the replacement of the lamp, fuse and photoelectric cell (PEC) provided an Endeavour Energy approved lamp is used. Such requests for limited maintenance on customer owned assets will be considered on individual applications. Maintenance-only rates (Unregulated Tariff Class 6) apply to such installations (refer section 7.2.4 for details).

### **5.1 Energy-efficient luminaires**

Endeavour Energy has been a pioneer in the introduction of energy efficient luminaires for Public Lighting. The concept of using T5 fluorescent technology for minor road lighting and more recently Light Emitting Diode (LED) street lights technology was approved after extensive trials.

Endeavour Energy's search for energy efficient, environmentally sustainable, reliable and long life luminaires on its Public Lighting network is ongoing. To achieve these outcomes, Endeavour Energy continuously provides feedback and specifications to guide manufacturers in developing new energy efficient luminaires with longer life and less deterioration of light output over time.

Endeavour Energy also maintains a proactive role with the industry and suppliers to keep abreast of new systems, products and technologies that are emerging in the area of Public Lighting. This shortens the introduction time for new products and monitors that up to date lighting technologies and equipment are available for Endeavour Energy's Public Lighting Customers.

### **5.2 Introduction of new equipment**

New equipment is introduced following its assessment and successful results from the extensive field trials that may run for a period of more than a year, depending on the type of equipment. Factors such as cost, performance, energy efficiency and environmental sustainability are considered while assessing new equipment for introduction.

Luminaires are particularly trialled in the field for their performance, including failure rates, deterioration in light output over time, and colour shift, before they are accepted for use on the network. The field trials are conducted in consultation with the relevant Public Lighting Customer/s. Public Lighting Customers are kept informed about the progress of the trials through regular meetings.

Endeavour Energy will consult with its Public Lighting Customers before any changes are made to the standard luminaire list.

Endeavour Energy will give reasonable consideration to trial new luminaires proposed by customers for inclusion on the standard luminaire list, but Public Lighting Customers need to be mindful of the fact that the trial process is costly and time consuming and may yield results that do not justify addition of a new technology luminaire to the standard list. Following successful field trials, a submission is made to the AER seeking tariff approval for the new luminaire.

### **5.3 Replacement of luminaires no longer supported**

Endeavour Energy will continue to maintain luminaires that are no longer used as standard until the end of their useful economic life, provided the spare parts (including lamp and visor) are available for them.

Luminaires that are no longer supported or obsolete are replaced with energy efficient luminaires on the current standard list at the end of their useful life through Endeavour Energy's maintenance process.

Tariff class 3 rates apply for obsolete components replaced on a Public Lighting asset. For minor road lighting, Endeavour Energy has three energy efficient options (LED, T5 linear fluorescent and 42W compact fluorescent) available for replacement. Any failed or unserviceable existing twin 20W or 40W fluorescent luminaires and 80W Mercury Vapour luminaires can be replaced with either LED street light or 42W compact fluorescent luminaire. Public Lighting Customers can nominate their default option for luminaire replacement on minor roads. Endeavour Energy will use StreetLED18 (total system wattage 22W) where no default option is nominated by the Public Lighting Customer. With changing technologies and improving efficiency of LED street lights, the default option may change. Sufficient trials will be conducted before any change in default option is considered.

For main roads, Endeavour Energy has energy efficient high pressure sodium vapour luminaires on its standard equipment list, which are used to replace mercury vapour luminaires when they fail or become unserviceable. While Endeavour Energy supports lamp replacement on mercury vapour luminaires, it is not deemed cost effective to replace a failed or unserviceable luminaire with a similar type for a number of reasons, including energy efficiency and lumen depreciation.

If the Public Lighting Customer has an alternate view on replacement of luminaires that are no longer supported, they must give notice to Endeavour Energy in writing. When a luminaire is replaced by Endeavour Energy, the asset register is updated and the annual charges for the luminaire are changed to the annuity tariff class 3.



A list of replacement luminaires for assets no longer supported is given below:

Luminaire type	Existing luminaire	Replacement luminaire
Fluorescent	2 x 20 W	StreetLED18
	1 x 40 W	StreetLED18
Mercury	50 W or 80 W	StreetLED18
	125 W	70 W HPS
	250 W	150 W HPS
	400 W	250 W HPS
Low pressure sodium	55 W	100 W HPS
	90 W	150 W HPS
	135 W	250 W HPS
	180 W	400 W HPS
High Pressure Sodium (HPS)	120 W	150 W HPS
	310 W	400 W HPS
	360 W	400 W HPS
	600 W	Decision on investigation
	2 x 400 W	Decision on investigation

#### 5.4 Painted columns

A Public Lighting Customer accepts responsibility for all maintenance of the paint finish, including repainting of the columns that may be required when they request use of painted column(s) for a new installation on the design brief. Endeavour Energy will accept ownership and all other maintenance responsibility for street lighting on painted columns provided Endeavour Energy's standard galvanised tapered street lighting columns have been installed.

If a painted column needs replacement, Endeavour Energy will replace it with a standard galvanised steel column. Subsequently, Public Lighting Customers may have the replaced galvanised steel column painted by an ASP, if they wish. Painting must be done by an ASP as this is defined as works on Endeavour Energy's network.

## 6.0 Administrative

### 6.1 Asset reports

#### 6.1.1 Inventory reports

Reports on Public Lighting inventories are available, on written request, from Endeavour Energy's nominated contact person in Annexure 1. Reports include the number and type of luminaires and are provided within one (1) weeks of the date of the request. This is over and above the customary inventory report sent every six months at the end of June and December each year.

#### 6.1.2 GIS reports

GIS reports on Public Lighting assets are available, on written request, from Endeavour Energy's nominated contact person in Annexure 1. Endeavour Energy uses the NSW Department of Lands (Land Information Centre - LIC) *Cadastre* for GIS and will accept no responsibility for compatibility of GIS data supplied with the Public Lighting Customer's GIS database. Public Lighting Customers will be responsible for all data compatibility issues.

### 6.2 Call Centre

Members of the public can report faulty streetlights, either on Endeavour Energy's website at [www.endeavourenergy.com.au](http://www.endeavourenergy.com.au), via the Endeavour Energy Outage app or by telephone to the 24-hour Customer Interaction Centre on 131 003. Public Lighting Customers can also report faults by providing a *Material list of faults*.

### 6.3 Customer Service Guarantees

Endeavour Energy aims to repair faulty street lighting reported by the residents and Public Lighting Customers within the customer service guarantee period. Where this is not achieved, a customer service guarantee payment process is in place.

The process is aligned to the requirements of the Code and customer service guarantee payments are made to the first complainant in the following situations:

- a) In instances where a Public Lighting Asset is not repaired within twelve (12) working days from the receipt of a fault report excluding network supply faults (except in exceptional circumstances, outlined in section 4.2.1 above), Endeavour Energy pays the first person who made the fault report \$15 for each public light if the person is: the owner or occupier of premises that abut the part of the street that, but for the fault, would ordinarily be illuminated by the Public Lighting asset.
- b) Where the Public Lighting Customer reports in the form of a *Material list of faults*, Endeavour Energy may nominate a reasonable timeframe, being not more than 30 days from receipt of the list of faults (excluding network supply faults), to repair the Public Lighting assets. If this time frame is not achieved, Endeavour Energy will pay the eligible customer \$15 for each public light not repaired in the agreed time frame.
- c) In the case of exceptional circumstances, Endeavour Energy may nominate a longer time frame to make repairs to the Public Lighting assets. This revised time frame will not be longer than 30 days from the receipt of the fault report. If this revised time frame is not achieved, Endeavour Energy will pay the first person who made the fault report in line with (a) above.

## 7.0 Commercial

### 7.1 Funding

Endeavour Energy will fully fund the installation of new Public Lighting assets for non-contestable works projects. Endeavour Energy will complete the design and construction of all non-contestable works projects that it funds.

Projects for which funding are provided by Public Lighting Customers or developers (in the case of new developments) are contestable and the services of an ASP shall be engaged to complete their design and construction. Public Lighting projects for relocation works will be funded by the Public Lighting Customer.

### 7.2 Pricing

In the following sections, constructed is defined by the AER as the date on which a customer accepts a quotation for the construction of new assets. However, as Endeavour Energy fully funds non-contestable projects, no quotation is provided to the Public Lighting Customers and constructed, for the purpose of this document, indicates the date on which a duly completed and acceptable design brief from the Public Lighting Customer is received by Endeavour Energy for construction of new assets.

While Tariff Class 1, 2, 3 and 4 assets are owned by Endeavour Energy, unregulated Tariff Class 6 assets are owned by the customer.

#### 7.2.1 Legacy rates – Tariff Class 1 and 2

Legacy rates apply to assets constructed prior to 8 August 2009. Under the AER determination, adjustments have been made for both inflation and redistribution of the asset base existing prior to 1 July 2009 across asset classes in a way that more closely reflects the age of each asset class.

Even though the AER cut-off date for switchover of charges from legacy rates to annuity rates was 1 July 2009, on demand from its Public Lighting Customers and ASPs, Endeavour Energy agreed to a date of 8 August 2009 to cater for completion of projects that were already under way and to give time for Public Lighting Customers and ASPs to understand the new rates.

Tariff Class 1 charges apply where Endeavour Energy provided installation capital. Tariff Class 2 charges apply where the Public Lighting Customer or the developer provided installation capital.

These rates are not available for new assets approved for construction after 8 August 2009.

#### 7.2.2 Annuity rates – Tariff Class 3 and 4

Annuity rates apply to assets constructed after 8 August 2009 and represent cost reflective rates, recovered over the life of the asset.

Tariff Class 3 rates apply where Endeavour Energy provides installation capital or has renewed the asset.

Tariff Class 4 rates apply where the Public Lighting Customer or the developer provides installation capital.

### 7.2.3 Residual capital value – Tariff class 5

Tariff Class 5 applies where Endeavour Energy has funded the capital or incurred tax liability for developer funded installations, but the asset is removed, replaced or modified before the end of its economic life.

### 7.2.4 Maintenance only rates – Unregulated Tariff Class 6

These rates apply to customer-owned assets on a metered and / or isolation only (unmetered) installation where Endeavour Energy has agreed to provide maintenance limited to the replacement of the lamp, fuse and PEC. For assets constructed prior to 8 August 2009, these rates were known as Schedule 3.

## 7.3 Billing of Public Lighting services

All data on Public Lighting assets is held in the street lighting equipment register in Endeavour Energy's Ellipse database. This includes all new and existing assets. This data is the basis for generating monthly Street lighting Use of System (SLUoS) customer bills in Endeavour Energy's billing system.

Public Lighting Customers are invoiced on a monthly basis for SLUoS charges (Public Lighting Customers also pay Network Use of System (NUoS) and electricity usage charges, which are billed monthly by their nominated retailer).

The current annuity billing is based on a component charge for the items that go into the construction of a public lighting asset. A luminaire installed on overhead mains requires a pole and a bracket, while a luminaire installed on underground mains requires a column and an outreach arm. Details are given below:

Equipment	Category	Height / Size (m)
Pole (wood)	Minor	≤ 11.0
	Major	> 11.0
Brackets	Minor	≤ 3.0
	Major	> 3.0
Column	Minor	≤ 9.0
	Major	> 9.0
Outreach arms	Minor	≤ 2.0
	Major	> 2.0

An invoice may include legacy rates and annuity rates. Legacy rates are based on the rate code for a type of luminaire under Tariff Class 1 and/or 2.

An invoice for annuity rates under Tariff Class 3, 4 and Unregulated Tariff Class 6 will include the following details:

- Quantity and type of luminaires connected.
- Quantity and type of brackets (minor/major).
- Quantity and type of outreach arms (minor/major).
- Quantity and type of column heights (minor/major).
- Quantity of wood poles (minor/major).
- Total Public Lighting service charges subject to GST.
- GST applicable charges.

All bills are verified for accuracy before they are mailed. Bills for a month are issued before the tenth (10th) day of the following month, and customers have thirty (30) days to pay from the middle of the bill issuing month.

## 8.0 Systems

Endeavour Energy draws on the following system resources for the Public Lighting business:

System	Data
Ellipse	Asset register – maintains an inventory of all Public Lighting assets, including in-service, energised, removed, out-of-service and proposed assets.
CAMS	Customer Application Management System, used to monitor progress of contestable works.
Banner	Billing system – interfaces with Ellipse and generates monthly bills.
CoManD	Project progress monitoring program (used by regions).
OMS	Outage Management System is used to log all emergency and system fault reports. OMS is a graphical interface based system that assists Call Centre staff to accurately locate faulty streetlights.
GNetViewer	NSW Department of Lands Cadastre Geographical Information System (GIS), used to find the location and attributes of street lighting assets.
NemSTAR	Applies metrological procedures to Ellipse data that creates data required to produce energy bills (NUoS) and billed in Banner.
Internet	Web-based interface for customers.

## 9.0 Service Level Agreements

Endeavour Energy provides a level of service that is in accordance with the Code. The organisation's belief is that this will provide a safe and reliable Public Lighting network with an acceptable level of service.

If a customer requires a level of service at variance with the Code, a commercial Service Level Agreement (SLA) will be required to be negotiated. Senior Engineer, Lighting Solutions, at Endeavour Energy may be contacted for this purpose.

Generally, Endeavour Energy's business systems are set up to provide service levels that are consistent with the Code and therefore, a level of service less than the Code's requirements cannot be provided.

Where a Public Lighting Customer requires a level of service that exceeds the Code's requirements, Endeavour Energy will explore the feasibility of updating business systems to provide an increased level of service and respond appropriately to the Public Lighting Customer.

Endeavour Energy, therefore, reserves the right not to provide a service level that is at variance with the Code.



## 10.0 Public Lighting Management Plan

### 10.1 Endeavour Energy's role

The role and responsibilities of Endeavour Energy under this plan are to provide a Public Lighting service in accordance with Endeavour Energy's *General Terms and Conditions* for connection of Public Lighting assets, and the Code, including:

- Providing a single point of contact (Public Lighting Customer Representative) at Endeavour Energy.
- Consulting with customers, developing a management plan for the operation, maintenance, refurbishment, replacement, repair and disposal of Public Lighting assets relevant to the customer.
- Maintaining an accurate inventory to record (for each luminaire that Endeavour Energy owns and maintains, or has agreed to maintain and manage on the customer's behalf) the location, type, rated power, date installed (where the luminaire was installed after the commencement of the Code), and infrastructure required to support the luminaire and any other information that is required to identify charges and ownership status.
- Developing a list of standard luminaires as the default for all new and replacement installations, and making the list available to the customer.
- Supporting obsolete luminaires until the end of their useful life, and replacing them with luminaires from the standard list.
- Designing and constructing all Public Lighting, including traffic routes, residential areas, minor roads, pedestrian crossings, parks, malls and car parks, in response to customer requests for non-contestable capital works projects.
- Providing ongoing luminaire refurbishment programs to upgrade the assets to more efficient units.
- Providing maintenance activities to optimise the service availability of Public Lighting assets.
- Disposing of replaced or damaged assets in a safe and environmentally responsible manner, either by Endeavour Energy or by its contractors.
- Operating 24-hour call centre facilities.
- Keeping customers informed of progress with repairs following system faults.
- Providing monthly billing services.
- Providing design certification and inspection facilities for contestable lighting works.
- Reporting quarterly on the current status of all design, construction and maintenance activities to Public Lighting Customers.
- Initiating service quality and efficiency improvements.
- Monitoring compliance with regulatory and customer requirements in safety, environmental and business risk matters.
- Providing nominated officers to discuss and enable matters of mutual interest regarding Public Lighting works.
- Providing up to date copies of the Code, when amended or on request, by e-mail, or as a printed copy by mail.

## 10.2 Role of Public Lighting Customers

- Providing a single point of contact (Public Lighting Customer Representative) between Endeavour Energy and the customer for both construction and maintenance activities.
- Keeping Endeavour Energy informed of the customer's strategic direction in relation to Public Lighting.
- Providing detailed requests (including design briefs) for new lighting installations and upgrades.
- Providing Endeavour Energy with requests in a manner that contributes to a manageable workflow and that will allow requests to be dealt with in a timely manner.
- Making requests for non-contestable design and construction services in a spirit that would indicate a willingness to proceed with works within a reasonable timeframe.
- Referring any reports of defective lights by residents to the Endeavour Energy website at: [www.endeavourenergy.com.au](http://www.endeavourenergy.com.au) or by phone on 131003.
- Encouraging residents and the public to report faulty streetlights using mail-outs with rate notices and/or media advertisements.
- Reviewing quarterly and annually, reports provided by Endeavour Energy and provide feedback.
- Working with Endeavour Energy to identify opportunities for safety, quality and efficiency improvements. Particular areas for improvements to include vandalism, glare complaints and tree trimming.
- Initiating service quality and efficiency improvements.
- Encouraging the public to report faulty street lights through mail-outs, rate notices, their web site and / or media advertisements.

## 11.0 Performance reporting

Progress on all design and construction projects will be reported to Public Lighting Customers on a quarterly basis, where appropriate. Generally, the progress reports will be by exception, highlighting only the projects where delays have occurred in design and/or construction, with reason/s for the delay/s provided. A report will not be issued where no new projects have been undertaken for the Public Lighting Customer during the previous quarter.

The annual report will include an analysis of performance against targets and the guaranteed service level: this report will be submitted to Public Lighting Customers within one (1) month of the end of the financial year.

Endeavour Energy will also provide reports relating to compliance with the Code to the Director General if and when required and specified in writing by the Director General.

## **12.0 Dispute resolution**

Public Lighting Customers should address their complaints in writing to:

The General Manager, Asset Management  
Endeavour Energy  
PO Box 811,  
Seven Hills NSW 1730

The General Manager, Asset Management will investigate the complaint and respond to the customer. If Endeavour Energy cannot resolve the complaint to the customer's satisfaction, the customer may refer the matter for mediation by an independent third party, such as the Australian Commercial Disputes Centre (ACDC) or another individual or organisation acceptable to both parties. A customer has recourse to arbitration or litigation if they are not satisfied with mediation.

## 13.0 Definitions

Definition	Details
Complaint	A written expression of dissatisfaction about an action, a proposed action, or a failure to act by the Public Lighting Service Provider, its employees or contractors. This includes failure by the Public Lighting Service Provider to observe its published practices or procedures.
Contestable works	Projects that are fully funded by the Public Lighting Customers and/or developers.
Customer	A Public Lighting Customer.
Distribution Network Service Provider (DNSP)	Has the meaning given to that term in the <i>Electricity Supply Act</i> 1995.
Fault	A luminaire that is not producing light or whose light output is either materially lower than normal operation or is ineffective.
Fault report	An instance of the Public Lighting Service Provider receiving a report of a fault through its Call Centre or website.
Luminaire	An apparatus that distributes, filters or transforms the light transmitted from one or more lamps and includes, other than the lamps themselves, all the parts necessary for fixing and protecting the lamps and, where necessary, circuit auxiliaries together with the means for connecting them to the distribution system.
Major capital works	Installations of more than seven (7) luminaries on existing infrastructure or projects requiring new pole, column or underground works and not requiring extension of low voltage power supplies for connection of new Public Lighting assets.
Management plan	The management plan referred to in clause 7 of the Code.
Material list of faults	A list of faulty street lights requiring repairs forwarded by a Public Lighting Customer.
Minor capital works	Installations of up to seven (7) luminaires on existing infrastructure. The lighting is to be mounted on the Service Provider's existing infrastructure (electricity distribution poles); the distribution poles are supplied with overhead wiring; and, standard luminaires are specified and are to be installed in accordance with Endeavour Energy's relevant network standards.
Non-contestable works	Projects that are fully funded by Endeavour Energy.
Non-material amendment	An amendment to the Code that the Director-General considers will have little or no financial or operational impact on service providers or customers, and includes: <ul style="list-style-type: none"> <li>a) correction of grammatical errors, omissions, numbering or other similar matters contained within the Code; or,</li> <li>b) the changing of processes and procedures where this will have little or no financial or operational impact on service providers or customers.</li> </ul>

Non-standard luminaire	A luminaire not appearing on Endeavour Energy's standard luminaire list.
Public Lighting	Term used throughout the Code to cover lighting schemes for the generality of roads and outdoor public areas (such as parks, reserves, pedestrian zones, footpaths, cycle paths, car parks and other public areas) that are managed by or on behalf of a Public Lighting Customer.
Public Lighting assets	All assets of the Public Lighting service provider or the Public Lighting Customer that are dedicated to the provision of Public Lighting, including lamps, luminaires, mounting brackets and supports on which the fixtures are mounted, supply cables and control equipment (for example, photoelectric cells and control circuitry) but not including the Public Lighting service provider's protection equipment (for example, fuses and circuit breakers).
Public Lighting Customer	A council (as defined by the <i>Local Government Act 1993</i> ), or local, State or Federal government agency that has authority over areas with Public Lighting.
Public Lighting Customer Liaison Representative	The primary representative of the Public Lighting service provider in any dealings with the Public Lighting Customer.
Public Lighting Customer Representative	The primary representative of the Public Lighting Customer in any dealings with the Public Lighting service provider.
Public Lighting Service Provider	A Distribution Network Service Provider (DNSP) providing Public Lighting services.
Public Lighting Services	Any of the following services that may be provided for the purpose of Public Lighting: <ul style="list-style-type: none"> <li>• operation of Public Lighting assets, including handling enquiries and complaints about Public Lighting, and dispatching crews to repair Public Lighting assets;</li> <li>• maintenance, repair, alteration, relocation and replacement of Public Lighting assets;</li> <li>• design of new Public Lighting assets;</li> <li>• installation of new Public Lighting assets; and,</li> <li>• financing of Public Lighting assets.</li> </ul>
Relocation works	Projects for relocation of Public Lighting assets due to road widening.
Service Level Agreement (SLA)	An agreement between a service provider and a customer setting out arrangements for the provision of a Public Lighting service.
Standard luminaire	A luminaire appearing on Endeavour Energy's standard luminaire list.



## Annexure 1

### Primary contact

All staff names given in the following list can be contacted by phoning the Endeavour Energy switchboard number 131 081. Alternatively, they can be contacted directly on the telephone numbers shown against each staff member.

All customers	Endeavour Energy Contact	Telephone
Code implementation and administration / technical matters.	Amitabh Shukla Senior Engineer Lighting Solutions	9853 6716
Billing, inventory, GIS data and price list.	Kenneth Dolbel Network Performance and Reporting Manager	9853 6057

### Regional contacts

Council	Endeavour Energy Contact	Telephone
Bathurst Regional Council Blue Mountains City Council Lithgow City Council Mid-Western Regional Council	Kelly Hamilton – Project Manager, Bowenfels	9853 5252
Blacktown City Council City of Ryde Council Hawkesbury City Council Hornsby Shire Council City of Parramatta Council Penrith City Council The Hills Shire Council	Seforosa Michael-Project Manager, Penrith	9853 7615
Portion of Bankstown City Council Camden City Council Campbelltown City Council Wollondilly Shire Council Fairfield City Council Cumberland Council Liverpool City Council Wingecarribee Shire Council	Ernest Estacio-Project Manager, Central Region	9853 7824
Kiama Municipal Council Shellharbour City Council Shoalhaven City Council Wollongong City Council	Adrian Ware-Project Officer, South	9853 2245

## Annexure 2

### Endeavour Energy: Public Lighting Scenarios

With the introduction of component based billing, various real time scenarios comprising of changes to street light components and their rates change in tariff classification have been discussed below.

#	Scenario	Tariff Change
1	Luminaire / Outreach is replaced before the end of its life through a maintenance event.	No residual value paid. Asset stays in the asset base until it reaches the end of its life. Customer pays annuity rates on new luminaire installed.
2	Luminaire / Outreach is replaced after the end of its useful life through a maintenance event.	No residual value, customer moves to annuity rates for new luminaire / outreach.
3	Luminaire / Outreach on a wood pole is replaced as wood pole has reached the end of its life through a maintenance event.	Network pole – No residual value payable on old luminaire / outreach (old luminaire / outreach removed from asset base). Customer moves to annuity rate for new luminaire / outreach (no charge for new pole).  Customer dedicated pole - No residual value payable on the luminaire / outreach (old luminaire / outreach removed from the asset base). Customer moves to annuity rate for whole installation including pole.
4	Luminaire on a steel column is replaced through a maintenance event as the column has reached the end of its life.	No residual value payable on old luminaire (old luminaire removed from asset base). Whole installation moves to annuity rates.
5	Entire Street Lighting installation installed or replaced at the request of the customer.	Residual value to be paid on all assets with an applicable TC5 charge and assets removed from the Regulated Asset Base. Tariffs on new installation would change to annuity rates.
6	Entire Street Lighting installation is installed or replaced as an incidental consequence of any other project initiated by Endeavour Energy.	No residual value paid for old installation (value is removed from the Regulated Asset Base). Customer moves to annuity rates for new Street Lighting installation.
7	Network removed from existing network wooden pole and now dedicated to Public Lighting user by Endeavour Energy.	Customer not charged for use of pole until pole reaches the end of its life. When pole reaches end of its life the entire installation is replaced and customer moves to annuity rates for the whole installation. Pole remains in Regulated Asset Base.

### General principles based on above analysis

Scenario	Customer requested	Endeavour Energy initiated	Maintenance event
Luminaire / Bracket or Outreach / Column or Pole changed at end of life.	No residual value. Customer moves to annuity rates for new asset/s only.	No residual value. Customer moves to annuity rates for new asset/s.	No residual value. Customer moves to annuity rates for new asset/s.
Luminaire / Bracket or Outreach / Column or Pole changed before end of life.	Customer pays residual value, old asset/s removed from asset base and customer pays annuity rates on new asset/s.	No residual value paid, asset/s removed from asset base and customer pays annuity rates on the new asset/s.	No residual value paid but asset stays in the asset base until it reaches the end of its life. Customer pays annuity rates on new asset/s.

#### Maintenance Event:

It may be difficult to determine whether an individual luminaire was changed before the end of its life or not. Given this, Endeavour Energy believes that the treatment of “before” or “at the end of its life” should be consistent.