Network Optimisation

Street Lighting

Management Plan

Abstract: Ergon Energy undertakes street lighting services that cover the operation, maintenance, repair and replacement of street lighting assets, the alteration and relocation of street lighting assets and the provision of new street lighting. The classification of Ergon Energy's street lighting services is as a Direct Control Service further classified as Alternative Control Services (ACS). Ergon Energy separates the costs associated with street lighting services from the costs of Standard Control Services (SCS).

Keywords:

Street Lighting, Street Lights, Alternative Control Services, Major Lights, Minor Lights, Bulk Lamp Replacement, AS/NZS 1158:2010

Network Optimisation Street Lighting Management Plan

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1 Overview

1.1 Purpose and scope

The purpose of this document is to describe Ergon Energy's street lighting asset management plans for the existing asset base over the regulatory control period from 1 July 2015 to 30 June 2020.

This document describes Ergon Energy's approach to street lighting asset management as reflected through its legislative and regulatory obligations, asset management strategies and standards. In addition it provides linkages and references to other programs and strategies of relevance to managing street lighting.

2 Inclusions and Exclusions

2.1 Inclusions

Under the current Australian Energy Regulator (AER) determined arrangements, Ergon Energy undertakes street lighting services that cover the operation, maintenance, repair and replacement of street lighting assets, the alteration and relocation of street lighting assets and the provision of new street lighting.

The Queensland Government Gazette determines that street lights are deemed to illuminate roads in Queensland. There are two types of roads being:

- **Local government roads** - roads for which a local government has control. These roads comprise land that is:
  - dedicated to public use as a road
  - developed for (or has as one of its main uses) the driving of or riding of motor vehicles and is open to, or used by, the public
  - a footpath or bicycle path
  - a bridge, culvert, ford, tunnel, or viaduct.
  - excludes State controlled roads and public thoroughfare easements
- **State controlled roads** – roads that are declared under the *Transport Infrastructure Act 1994* (Qld) to be a State controlled road for which the relevant Minister for that Act has control e.g. Department of Transport and Main Roads (DTMR).

Street light customers include Local Government Authorities (LGA) and DTMR. Ergon Energy does not maintain lights that are owned by customers. Street light ownership is categorised as follows:

- Non-contributed (Rate 1) lighting – street lighting supplied, installed, owned and maintained by Ergon Energy
- Contributed (Rate 2) lighting – street lighting for which all supply and installation costs are funded by the street lighting customer and then ownership is vested in Ergon Energy on completion of the installation. Ergon Energy then assumes responsibility for maintenance of the installation.

- Customer owned (Rate 3) lighting – street lighting supplied, installed and owned and maintained by the street lighting customer.
- The physical asset which comprises a street light includes:
    - Luminaire
    - Lamp
    - Arm or outreach
    - Low voltage (LV) connection
    - Photoelectric (PE) cell or controlled device
    - Dedicated street light poles

2.2 Exclusions

For the purpose of describing the management of street lighting the following are excluded from consideration in this management plan.

- Customer owned lighting infrastructure, either unmetered (connected as a tariff 71 load) or metered
- Customer owned lights connected as a tariff 91 load or metered
- A pole, when it carries both distribution network assets and street light assets
- The street light control wire
- The low voltage reticulation to the street light
- Assets regulated by the Queensland Competition Authority (QCA) such as those found in Ergon Energy's isolated communities

3 References

3.1 Ergon Energy controlled documents

Document number or location (if applicable)	Document name	Document type
STNW0708	Standard for Preventative Maintenance Programs 2014-15	Standard
EP51	Ergon Energy Asset Management Defect Policy	Policy
NA000403R434	Public Lighting Design Manual	Design Manual
SGNW0036	Street Lighting Strategy	Strategy
Share-point	Network Optimisation Management Plan Overhead Feeder Circuit	Management Plan

3.2 Other documents

Document number or location (if applicable)	Document name	Document type
To be confirmed	Service Levels between Ergon Energy and Local Government Authorities	Standard

4 Legislation, regulations, rules, and codes

This document refers to the following:

Legislation, regulations, rules, and codes
Transport Infrastructure Act 1994 (Queensland)
AS/NZS 1158:2010 Lighting for Roads and Public Spaces
Queensland Government Gazette

5 Definitions, acronyms, and abbreviations

5.1 Definitions

For the purpose of this plan, the following definitions apply:

Term	Definition
Customer portal	Spatial database and its associated management processes that relate to street lighting assets and the associated standing data used by the Australian Energy Market Operator (AEMO) for market settlement purposes.
FACOM	The Ergon Energy customer management system, a register of customers and accounts
FRC	Full retail competition was introduced in Queensland from 1 July 2007; This is when the majority of customers in Queensland were eligible to obtain a market contract. Ergon Energy was not required to publish customer details to the market under a minimalist transitioning approach. The start of the next regulatory control period 2015 to 2020 is likely to see the full publication of customer details enabled.
High Safety Risk Road Locations	Pedestrian crossings, traffic islands, roundabouts, and other locations with high intensity lighting
L1 Defect	The street lighting defect priority for an inoperable light on a defined major road
Major Roads	Roads labelled as arterial, sub-arterial, or collector and high safety risk locations
Minor Roads	Roads that are not arterial, sub arterial or collector. Often labelled as residential or access roads, these have low intensity lighting
PE Cell	Photoelectric Cell used for the electrical switching on and off lamp/light based on pre-set natural light levels
Public Lighting Design Manual	The manual for design of street lighting assets in Queensland authorised and updated from time to time by Ergon Energy and Energex
Road Patrol	Road Patrol Lighting Outage Detection Program
SmallWorld	The Ergon Energy design register and geo-spatial information system (GIS)
Street Lighting	Means as the context requires lighting that illuminates local government and state controlled roads and includes a luminaire, lamp, Low voltage (LV) supply and a photoelectric cell or control device
Street Lighting Audit Initiatives	The audit completed in 2013 and ongoing work related to managing the street lighting assets in the customer portal software (LightMap or equivalent)

Term	Definition
Street Lighting Customers	Local Government Authorities and Department of Transport and Main Roads
Tariff 71	A notified tariff published in the Queensland Government Gazette available to Street Lighting Customers for the purpose of illuminating roads as defined within the Queensland Government Gazette.
Tariff 91	A notified tariff published in the Queensland Government Gazette available for unmetered electricity and available to small loads, as approved by the distribution entity.

5.2 Acronyms and abbreviations

Acronym or abbreviation	Definition
ACS	Alternative Control Service
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulatory
BLR	Bulk Lamp Replacement Maintenance Program
CF	Compact Fluorescent
CSO	Community Service Obligation
DTMR	Department of Transport and Main Roads
IDC	Inter Departmental Committee
FMC	Field Mobile Computing
FRC	Full Retail Competition
HPS	High Pressure Sodium
LED	Light-Emitting Diode
LGAs	Local Government Authorities
LPS	Low Pressure Sodium
LV	Low Voltage
MH	Metal Halide
MV	Mercury Vapour
OEM	Original Equipment Manufacturer
QCA	Queensland Competition Authority
SCS	Standard Control Systems
SV	Sodium Vapour

6 Summary of preventive maintenance programs

Preventative maintenance of street lighting in Ergon Energy comprises the following scheduled inspection and maintenance activity.

- Preventative maintenance – road patrol, bulk lamp replacement (BLR) program and pole inspection.
- Forced and corrective maintenance – defect remediation or corrective maintenance. Table 1 summarises the preventive maintenance programs and inspection intervals for street lighting.

For further details on maintenance programs, refer to the current *Standard for Preventive Maintenance Programs 2014-15*. This document is annually and details the inspection and maintenance programs that will be conducted during the period detailed.

Table 1 Current preventative maintenance programs

Program Name	Interval or Criteria
Road Patrol Program	
Routine streetlight patrols	Two night patrols of major roads or defined pedestrian crossing or intersection every 12 months
Bulk Lamp Replacement Program	
Routine bulk lamp replacement	3 year cycle 6 year cycle – PE cell replacement
Pole Inspection Program	
Routine light pole inspection Wood pole urban Wood pole rural (high rainfall) Steel pole (direct buried urban/coastal)	 4 year cycle
Wood pole rural	6 year cycle
Steel pole and tower Concrete pole	8 year cycle

The preventive maintenance programs will not include any customer owned lights.

Only LGA's where there are more than 200 major road street lights will undergo a road patrol and a BLR. All other LGAs undergo a BLR only.

7 Summary of refurbishment and replacement programs

Ergon Energy does not currently run refurbishment and replacement programs for street lighting. The management plan in this regards is a 'run-to-failure' program where as a consequence of either the BLR and other preventative maintenance programs or overhead asset inspection program or through other means (e.g. street lighting customer notification or general public notifications through Ergon Energy's national call centre) Ergon Energy become aware of defective street lighting assets and rectify. In this event the restoration activity is captured under the forced and corrective maintenance program.

7.1 Asset description

In 2013 Ergon Energy completed a street lighting audit and now has a complete database of records recorded in the customer portal software[1]. This has substantially improved the ability to effectively manage and bill street lighting assets.

The customer portal is also an important tool for customers who can now review lighting assets in their area, see new inventory and confirm responsibilities for every light in their geographical jurisdiction. This enhanced functionality is a significant component of Ergon Energy's objective to improve the customer service experience for street lighting customers

Service levels with each local government street lighting customer are under development and will improve clarity for both the customer and Ergon Energy on street lighting responsibilities.

Based on a street light audit completed in 2013 Ergon Energy has a variety of street lighting equipment types with a population of approximately 160,000. Ergon Energy owns and maintains approximately 134,000 minor road lights and 10,000 major road lights. There are a further 16,000 customer owned luminaires that are not owned or maintained by Ergon Energy. These categories form the basis of the ACS charges levied to the street lighting customers.

7.1.1 Major road lighting

Major road lighting has higher luminance requirements for use on roads, roundabouts and high traffic areas such as pedestrian crossings. The current standard lights used on major roads are:

- 100W,
- 150W,
- 250W
- Some 400W HPS.

There are a significant number of obsolete luminaires in the street lighting inventory. These are replaced as they fail (≈25%):

- 250W,
- 400W,
- 700W Mercury Vapour (MV) lights existing on the system.

[1] As at the date of this document LightMap is the customer portal software

7.1.2 Minor road installations

The current standard lights used on minor road installations are predominantly:

- 50W
- 80W
- 125W MV
- Some 70W and 100W high pressure sodium (HPS) lights are used in some special locations

There are a minor number (<1%) of obsolete lights (approximately 250 fluorescent lights) existing on the system

As a result of a Regional Queensland Energy Efficient Public Lighting trial (December 2012), Ergon Energy introduced a number of energy efficient luminaires to its catalogue for use in Greenfield installations. Further enhancements of the luminaire catalogue will continue to occur as new technology is evaluated and found suitable for the network and environmental conditions this action includes removal of street light types which do not meet expectation. Ergon Energy plans to systematically assess and validate Light-Emitting Diode (LED) technology in the 2015 to 2020 regulatory control period.

7.2 Asset condition

Ergon Energy has an obligation to meet a street lighting service availability of 95% (as set out in AS/NZS 1158 *Lighting for Roads and Public Spaces).* The previous street lighting maintenance strategy (pre 2009) was not delivering the 95% availability requirement outlined by AS/NZS 1158:2010. Basic modelling of the Original Equipment Manufacturer (OEM) supplied failure data indicated that Ergon Energy was likely to be achieving around 85% availability although there was no way to derive an exact measurement because at the time monitoring of street lighting availability or reliability performance was not in place. Consequently a 3-year BLR program was instituted to ensure compliance across the fleet.

Ergon Energy has an ageing street lighting population; with the exception of the lamp. The existing BLR program aims to replace all lamps once every three years to maintain compliance with Australian Standards light depreciation. The age of the major and minor lighting hardware (excluding lamps) is shown in table 2.

Table 2 Age of major and minor lighting

Lighting type	Age range
Mercury Vapour	new – 30 years
High Pressure Sodium	new – 15 years
Metal Halide (MH)	new – 5 years
Other	Variable

Significantly enhanced data relating to age profile has been made available through the street lighting audit completed in 2013.

7.3 Asset creation

Within Ergon Energy's footprint, growth in new property developments and roadways continues to contribute to the street lighting asset base. This growth is predominantly contributed assets from both LGA's and DTMR and must be constructed in accordance with 'Public Lighting Design Manual'. Based on the average growth over the past 4-years, the population growth rate for street lighting is 2.6% per annum.

7.4 Known and emerging issues or risks

7.4.1 Vandalism

In certain areas, street lighting assets require very frequent maintenance due to vandalism of the luminaire or fitting. Work will continue to identify and source more sustainable lighting types for these areas.

7.4.2 Maintaining lighting to Australian standard requirements

Ergon Energy will operate its street lighting asset base, efficiently and effectively over the economic life in accordance with 'in-service' values specified for 'Category V' and 'Category P' lighting detailed in AS/NZS 1158:2010 This compliance will be achieved through the use of 'like-for-like' replacement of lamps and luminaires. An emerging issue in this regard relates to the transition to LED technology where further work is required to address AS/NZS 1158:2010 compliance. Transition to LED technologies is considered in the 'Street Lighting Strategy'.

7.5 Stakeholder management

Ergon Energy has street lighting customers comprising 70 (seventy) LGAs and the DTMR all of which are actively seeking ways and means of reducing the burden of rising electricity costs. Street lighting and energy costs are a significant proportion of total energy expenditure for these customers.

Currently Ergon Energy's street lighting customers pay for the energy and network access component of their charges through tariff 71 and, for the first time in the financial year 2014 – 2015 are paying 10% of the ACS charges with a price path to full recovery being considered by the Queensland Government. The balance of the ACS charges are to be recovered by Ergon Energy via the Community Service Obligation (CSO) paid to Ergon Energy Retail (EEQ) by the Queensland Government.

There has been a recent program to inform our street lighting customers of the outcome of the street lighting audit Initiative. This communication encompasses the negotiation of ownership and responsibility for lighting fleet assets, introduction of service levels, asset modernisation strategy and customer portal for asset management.

7.5.1 Street lighting strategy

Ergon Energy aims to respond to its customer's needs in street lighting by focusing on the principles of prudency and efficiency in the delivery of this service.

Some LGA's have requested that Ergon Energy deploy LED technology but a number of issues need to be resolved before this could occur.

The 'Street Lighting Strategy' is a proactive approach which will set strong foundations for efficient decision making in this complex area and will provide Ergon Energy with a framework to capture and manage issues and risks both known and unknown.

7.5.2 Service levels

Ergon Energy will maintain its street lighting customers' street lights through service levels reviewed annually. This standard will detail service levels covering provision and maintenance of street lighting assets.

Street lighting customers may require Ergon Energy to provide a level of service beyond the standard service levels, in these instances Ergon Energy will engage and discuss with street lighting customers a variation to the standard service levels. Ergon Energy will make best endeavours to accommodate these variations subject to regulatory arrangements.

The street lighting customer service levels are likely to cover:

- Provision of street lights
  - implementing criteria to consider new technologies such as LED including assessment methodologies, specifications, capital requirements and alterations to the charging regime.
  - processes for new street lighting design
  - responsibilities for compliance with Australian standards for street lighting upgrades
- Interaction and communication
  - application of a customer portal management tool
  - notification process for service installation and abolishment
- Maintenance of street lights
  - identification of which lights should be patrolled
  - monitoring of the number of light outages at any time and time taken to repair light outages
  - implementing fault reporting arrangements
  - implementing performance standards and penalties for non-compliance with standards
  - ensuring processes to make available annual performance statistics
  - replacing lamps within a stipulated timeframe, including benchmarking standards and monitoring and reporting on the service levels achieved
  - defining asset useful life and condition monitoring criteria
- Performance reporting
  - Ergon Energy will in consultation with our street lighting customers, develop a set of key performance indicators and provide a dashboard to customers that will be developed over time.

7.5.3 Data quality

In 2014 Ergon Energy finalised an audit of all street light assets connected to its network. The inventory data is now of high quality having been validated by street light customers. Work has commenced on delivering a sustainable enterprise architecture for street lighting data flows to ensure data remains valid. This work is ongoing as part of the street lighting audit initiative.

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7.5.4 Increasing age profile

Ergon Energy is seeking increased CAPEX refurbishment expenditure in the 2015 to 2020 regulatory control period due to an increased distribution in age profile requiring additional luminaire replacement during cyclic maintenance. The basis for which this additional CAPEX is forecast is a combination of replacement rates over recent years (low at 1.3%) and the engineering life of luminaire assets.

8 Asset management approach

Ergon Energy has adopted the following approach to managing street lighting assets:

- Operating and maintaining in accordance with its preventative and forced and corrective management plans
- Utilising its business systems and data capture mechanisms to support processes around street lighting.

8.1 Operation and maintenance

Ergon Energy will operate its street lighting asset base, efficiently and effectively over the economic life in accordance with 'in-service' values specified for 'Category V' and 'Category P' lighting detailed in AS/NZS 1158:2010.

By implementing strategies to meet AS/NZS1158:2010 requirements, Ergon Energy will ensure the safety risk to the public is minimised, and that the risk of litigation or prosecution to Ergon Energy is minimised.

The objective of this approach include:

- Ensuring public safety through meeting the street lighting availability requirement, leading to an acceptable percentage of failed lamps in service
- Maintaining an acceptable corporate risk profile through ensuring public safety and reducing the likelihood of litigation by addressing lumen depreciation issues
- Optimising operating expenditure spend through the BLR maintenance program and the cheaper cost of planned lamp replacement as opposed to more expensive unplanned forced and corrective maintenance
- Maintaining street lighting population compliance with the AS/NZS1158:2010 enabling the BLR maintenance program via Field Mobile Computing (FMC) to be Ergon Energy's primary source of data capture
- Ensuring full and accurate deployment of all required business processes.

8.1.1 Preventative maintenance

The preventative maintenance programs are comprised of the following elements:

- Road patrol
- Bulk Lamp Replacement (BLR)
- Pole inspection

Preventative maintenance programs do not include customer owned (Rate 3) lights.

The road patrol program and the BLR program do not include provision to respond to defective streetlights reported by the public. These are addressed in the forced and corrective maintenance program.

Other public lighting hardware such as wiring will be assessed during the preventative programs and replaced on an 'as needs' basis.

Road patrol

The road patrol preventative maintenance program involves two night patrols of major roads or defined pedestrian crossings every 12 months. The purpose is to proactively identify major lights requiring maintenance and address new light infant mortality.

Road patrols are undertaken for street lighting customers with more than 200 major road streetlights. Ergon Energy does not undertake any patrols of lighting on minor roads. However the BLR program ensures that lumen output is maintained within allowable limits on minor roads with replacement of lamps every three years.

Bulk lamp replacement

The aim of the BLR is to reduce the frequency of ad-hoc repairs in addition to maintaining lumen output. The BLR program encompasses all street lighting not previously identified as part of the road patrol program.

The street lighting lamp is replaced every three years based on the OEM provided mortality rates and lumen depreciation calculation per AS/NZS1158:2010 so that service levels can be achieved.

Changing of PE cells occurs every second lamp replacement cycle (e.g. on a six-year cycle) based on OEM performance data, past experience and benchmarking with other electricity utilities.

Pole inspection

Ergon Energy undertakes pole inspections on a cyclic basis at which time issues with the street lighting asset base are also identified and can be scheduled for maintenance or for forced and corrective maintenance depending on the nature of the issue. See Table 1 above for specific pole inspection cycles. Refer to 'Network Optimisation Management Plan Overhead Feeder Circuit' for further details

Line Asset Inspection

Assessment of the condition of the luminaires and brackets is part of the line asset overhead and underground inspection program and the BLR program. The replacement of defective luminaires and brackets identified through the lamp replacement program occurs concurrently with lamp replacement. Refer to 'Network Optimisation Management Plan Overhead Feeder Circuit' for further details

Key failure modes

Street lighting experiences a number of key failure modes. Table 3 shows the types of defects that occur with street lighting.

Table 2 Street lighting key failure modes

Key failure modes	Definition
Luminaires in operation constantly	This typically is due to a control device failure such as ripple control relay, PE cell of control wire failure which results in positive failure mode where the light is latched on. This failure mode results in unnecessary energy consumption.
Luminaires not operational	There are many causes of luminaire failure including lamp failure, fuse operation, control device failure, network damage etc. This results in asset failure and loss of service.
Damaged light fixture	Malicious or unintentional damage: Malicious damage is usually a result of contact by a targeted projectile. Unintentional damage includes damage by motor vehicle and other unintentional impacts. This damage usually results in loss of service.
Defective brackets	Bracket defects are usually age related and detected as part of the inspection programs. It is unlikely that a bracket defect will cause a loss of service.
Streetlight pole defects	Streetlight pole defects are detected and rectified under the Overhead Asset Inspection Program.

8.1.2 Forced and corrective maintenance

The primary trigger for forced or corrective maintenance is public notification via the NCC or the Ergon Energy website.

Ergon Energy targets to rectify all detected or reported defects within time frames depending on the location of the light and or potential to cause public safety issues, typically

- Urban – 3 business days
- Rural – 7 business days
- Remote – 10 business days

Ergon Energy aims to resolve faults that have the potential to cause major public safety issues within 48 hours:

- All streetlights are out on a major intersection or thoroughfare e.g. highways, roundabouts, pedestrian crossings, T-intersection
- Where the road has high levels of traffic
- All lights in a public venue e.g. all lights on a wharf or jetty

The replacement of all defective street lighting luminaires and brackets or cross arms identified during the preventative maintenance program is capital expenditure in accordance with the L1 Defect Policy as stated in document EP51 'Ergon Energy's Asset Management Defect Policy'. Forecasting of replacement quantities for luminaires and brackets uses historical average replacement rates.

8.1.3 Disposal

Both MV and sodium vapour (SV) lamps contain mercury, which is a hazardous waste requiring careful disposal in accordance with relevant legislation. Lamps containing mercury no longer serviceable must be disposed of appropriately.

While there are regional differences in the details of disposal, all Ergon Energy depots have blue recycling bins where field staff and lighting contractors deposit these lamps. Appointed contractors then dispose of the contents of these bins.

8.1.4 Strategic Spares

Maintenance of the inventory is at levels that support street lighting customer initiated works and, forced and corrective maintenance. Strategic spares are not held for street lighting assets as they are able to be sourced in acceptable timelines

8.1.5 Systems and data

There are a number of business systems supporting the street lighting process. These aim to:

- be the database of reference for street lighting assets
- identify the responsible authority for each lighting asset
- provide a mechanism to negotiate responsibility for disputed lighting assets

In 2013 work commenced on building sustainable enterprise architecture for street lighting data flows to ensure data remains valid. This work is ongoing as part of the street lighting audit initiative.

8.1.6 Customer portal

In 2013, Ergon Energy implemented a web-based customer portal utilising LightMap software as the commencement platform. The spatial data-base, and its associated processes, manages street lighting assets and the related standing data used by the Australian Energy Market Operator (AEMO) for market settlement purposes.

From 2015 each LGA and DTMR office will employ this customer portal system as the tool for managing their street lighting inventory and contesting any inconsistencies (e.g. billing variations). This is a web-based system, filtered by street lighting customer and provides a spatial view of the lights included in their billing. Customers can also see details for those lights by type, wattage and rate.

LightMap will provide customers with the ability to select a light and register a notification of disagreement with the data. Ergon Energy receiving this automatically relayed notification will process it for follow-up with the customer.

There is an ongoing requirement to manage customer owned lights geospatially to prevent unnecessary maintenance of non Ergon Energy assets.

8.1.7 Ellipse

This system holds physical network (make/model of equipment) data and is the master system for maintenance purposes. This system also records all transactions undertaken on street lighting e.g. installation, patrol, BLR, removal. There is a one-way interface from SmallWorld to Ellipse to create and update some street lighting data.

8.1.8 SmallWorld

Ergon Energy uses the design register SmallWorld for all internal design operations. As a design register, SmallWorld is intended to hold logical data e.g. the size, type and mounting height of street lighting.

8.1.9 Customer information system (CIS)

FACOM is the Ergon Energy customer information system (CIS) and as such has a register of customers and accounts. It is the billing engine for street lighting, producing monthly bills compiled from a combination of the inventory tables, which list the number of each type and rate of street light for each customer, and energy cost tables that store the relevant daily dollar rate for each type and rate of street light. It is expected that Ergon Energy will replace FACOM as its CIS during the 2015-16 financial year. The replacement system, PEACE, is better designed to manage billing of the lighting fleet.

8.1.10 Field mobile computing

Field mobile computing (FMC) is the Ergon Energy field computing system used to manage BLR and road patrol activities. External resources conduct the work with all scheduling and recording taking place in the FMC. There are two-way interfaces between Ellipse and the FMC but there is not an interface between the FMC and SmallWorld.

8.2 Refurbishment and Replacement

8.2.1 Refurbishment

Asset refurbishment is currently managed under the processes documented in the ‘Network Optimisation Management Plan Overhead Feeder Circuit’.

8.2.2 Replacement

To generally maintain design compliance, Ergon Energy replaces luminaires on a like-for-like basis with the exception of the obsolete types targeted for replacement. These obsolete types include fluorescent, incandescent, low-pressure sodium (LPS) and major MV luminaires.

A percentage of luminaire replacements also require replacement of the bracket or cross arm due to condition, or compatibility with modern luminaires. A program to replace several hundred asbestos sealed luminaires has been recently completed.

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Assets requiring replacement are detected either during preventative maintenance and inspection programs or reported by the public.

There are no current replacement programs for street lighting, however Ergon Energy's 'Street Lighting Strategy' considers a transitional pathway to accommodate LED street lighting in the future.