Forecast Expenditure Summary

Public Lighting Services

2015 to 2020

Contents

1. About this overview document

This section explains the purpose and structure of this overview document.

1.1 Purpose

The purpose of this overview document is to explain and justify Ergon Energy's approach to street lighting services[1] for the next regulatory control period, 1 July 2015 to 30 June 2020. It includes explanation and justification of:

- Ergon Energy's underlying strategy for street lighting services
- operating expenditure and capital expenditure forecasts
- the derivation of a revenue requirement
- the construction of proposed prices.

It aims to provide the reader with an understanding of Ergon Energy's approach to street lighting services. However, because it is an overview document, it necessarily addresses some matters at a relatively high level and refers out to other documents for further detail.

Please note that this document uses the term 'street' lighting as within Ergon Energy, 'public lighting refers to a wider category of services – which include street lights. Particular references to public lighting arise because the term has been used by the Australian Energy Regulator (AER) or others.

This overview document provides details of actual, estimated and forecast street lighting operating expenditure and capital expenditure for the 2010-15 and 2015-20 regulatory control periods. All operating expenditure and capital expenditure numbers in this document are in nominal dollars unless otherwise noted.

This is Version 2 of the overview document. Version 1 was submitted with Ergon Energy's Regulatory Proposal in October 2014. In April 2015 the AER published its Preliminary Determination. This version of the overview document has been prepared to accompany Ergon Energy's revised Regulatory Proposal.

1.2 Structure

The remainder of this overview document is structured as follows:

- Section 2 provides historical and regulatory context for street lighting services and sets out issues that Ergon Energy believes need to be dealt with in the next regulatory control period and in the longer term. It also contains the proposed prices.
- Section 3 describes Ergon Energy's proposed strategy for the street lighting task for the next regulatory control period.
- Section 4 describes how Ergon Energy will engage with its street lighting customers.
- Section 5 sets out how Ergon Energy will maintain the existing base of street lighting assets. It details street lighting operating expenditure for the current and next regulatory control periods.

[1] Public lighting and street lighting are used interchangeably in our revised Regulatory Proposal

- Section 6 sets out how Ergon Energy will approach the provision of new street lighting. It details street lighting capital expenditure for the current and next regulatory control periods.
- Section 7 explains how the existing street lighting asset base, consequences of past regulatory decisions and past expenditure patterns, and forecasts of operating expenditure and capital expenditure are combined to construct a revenue requirement for the street lighting Alternative Control Service (ACS).
- Section 8 explains how the street lighting revenue requirement is used to construct ACS prices to be paid by customers.

2. Context

This section defines street lighting and describes the way in which costs are recovered from customers. It also sets out the regulatory requirements applicable to street lighting services.

This section then provides the reader up-front with a view of Ergon Energy's street lighting asset base and its actual, estimated and forecast street lighting operating expenditure and capital expenditure that will be explained and justified in the remainder of this overview document.

2.1 What is street lighting?

Street lighting is an essential service that illuminates roads. These roads may be the responsibility of the Department of Transport and Main Roads (DTMR) or a local government authority (LGA).

DTMR controlled roads are those declared under the *Transport Infrastructure Act 1994* (Qld). In general, local government authorities are responsible for minor roads where the visual requirements of pedestrians are dominant and DTMR is responsible for major roads where the visual requirements of motorists are dominant.

Street lighting assets typically consist of a mounting system, luminaire, lamp and a photoelectric (PE) cell or other control device.

A street lighting asset may be:

- owned and operated by Ergon Energy (EO&O);
- gifted to Ergon Energy and thereafter maintained and operated by it (G&EO); or
- customer owned and operated by someone other than Ergon Energy (CO&O).

2.2 How are costs of street lighting recovered from customers?

The basis by which the various costs of providing street lighting are recovered from customers is as shown in figures 1 and 2 below:

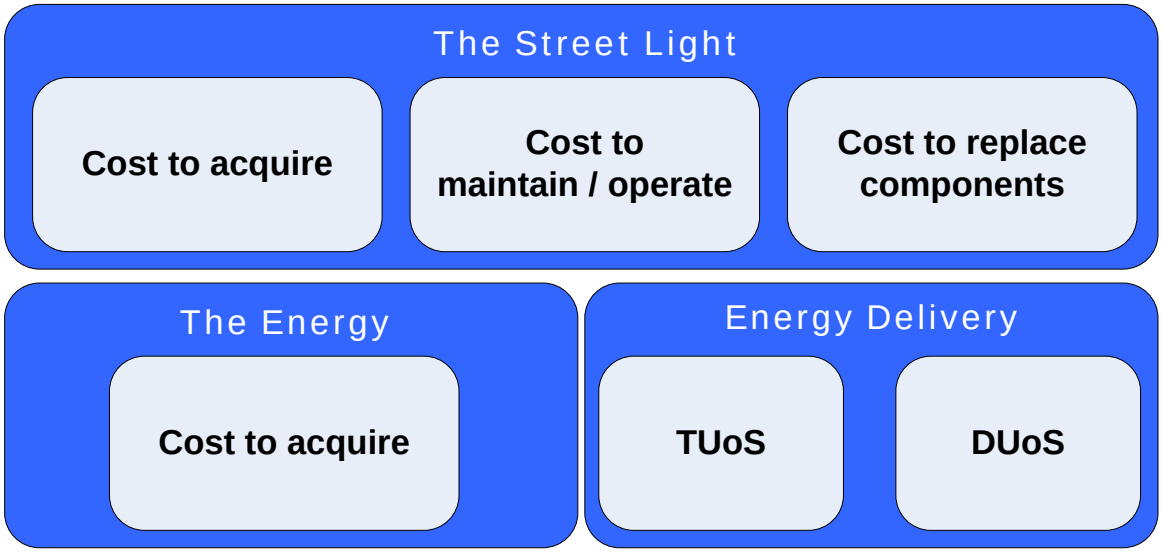

Figure 1: cost components for street lighting

The street light is the equipment that directly provides the street lighting service. It includes a luminaire, lamp and a photoelectric cell or control device

The energy is the electricity that powers the street light

Energy delivery consists of the services that convey electricity from the source of generation to the street light – that is transmission use of system (TUoS) charge and distribution use of system (DUoS) charge.

Component	EO&O	G&EO	CO&O
The street light			
- Cost to acquire	x	n.a.	n.a.
- Cost to maintain / operate	x	x	n.a.
- Cost to replace components	x	x	n.a.
Cost of energy	x	x	x
Energy delivery			
- TUoS	x	x	x
- DUos	x	x	x

Figure 2: Basis for charging for street lighting

This overview paper is primarily concerned with what is termed 'the street light' in figures 1 and 2. These services are classified by the AER under the National Electricity Rules (NER) as ACS with prices set by the AER. The costs recovered by the ACS charges are those enclosed in blue lines in figure 2.

2.3 History of charging for street lighting in Ergon Energy's distribution area

Up until the start of the 2010-15 regulatory control period street lighting was charged to customers through a single state wide charge at the retail level – set by the Queensland Competition Authority (QCA). To the extent that street lighting costs were recorded and monitored by Ergon Energy and its predecessor businesses, it was primarily for operational purposes. In general, the financial costs were viewed as a component of the wider distribution business.

This created information challenges when Ergon Energy was required by the AER to provide information for the setting of separate ACS prices for the 2010-15 regulatory control period. These challenges are referred to in the AER's final 2009 determination and led to a single ACS charge being approved for EO&O and G&EO for the current period.

This 'mixing' of EO&O and G&EO prices has been of no practical consequence up to and including the 2013-14 year because the ACS charges in respect of street lighting have been borne by the Queensland Government under the Community Service Obligation (CSO) arrangements that support the Uniform Tariff Policy (UTP). The retail tariffs charged by Ergon Energy Retail (EEQ) to the LGAs and DTMR have not included this charge (in part or whole) up until and including 30 June 2014. Following various reviews by the Queensland government, from 1 July 2014, EEQ has been passing through 10% of the ACS charge to customers. The government has also indicated that it will develop a price path such that all costs are recovered from customers – giving consideration to customer needs. The time frame for implementing this is not known.

As a result of customers now directly bearing part of the costs of ACS charges, Ergon Energy recognizes that it is essential that separate charges be determined for EO&O and G&EO street lights for the 2015-20 regulatory control period.

A considerable amount of effort has gone into improving Ergon Energy's records in relation to street lighting. This work is described in later sections of this document.

In summary, the retail tariffs paid by EEQ's street lighting customers have been and will be as follows:

- Until 1 July 2014: the costs enclosed by the red lines in figure 2
- From 1 July 2014: the costs enclosed by the red lines plus 10% of the costs within the blue line
- At some point in the future the costs enclosed by the green line in figure 2

If a street light is not owned by or gifted to Ergon Energy for ongoing operation, it is not maintained by Ergon Energy and there is no street lighting service provided and hence no ACS charge.

2.4 Summary of current and proposed charges

The ACS prices that were being charged for the 2014-15 year are as shown in Table 1 below.

Table 1: ACS prices 2014-15

	Queensland Government	Charged to customer	Total fee
Major street light (EO&O and G&EO)	$0.873 / day	$0.097 / day	$0.97 / day
	$318.64/ year	$35.41 / year	$354.05 / year
Minor street light (EO&O and G&EO)	$0.522 / day	$0.058 / day	$0.58 / day
	$190.53/ year	$21.17 / year	$211.70/ year

The prices proposed for the first year of the 2015-20 regulatory control period, 2015/16, are as shown in Table 2.

The prices in Table 2 are those proposed by the AER in its Preliminary Determination. The use of these prices for year 1 of the 2015-20 regulatory control period is dictated by transitional arrangements under the NER where the Preliminary Determination takes effect from 1 July 2015. Using the inputs Ergon Energy proposes in its revised Regulatory Proposal produces materially similar prices for Ergon Owned and Operated street lights. However, for Gifted and Ergon Operated street lights the figures calculated from inputs in the revised Regulatory Proposal are somewhat higher. Ergon Energy proposes that an adjustment be made in year 2 of the regulatory control period as part of a true-up mechanism between the AER's Preliminary Determination and its Substitute Determination. This adjustment is described below.

Table 2: Proposed prices for 2015-16.

	Daily charge	Annual charge
EO&O		
Major street light	$1.02520	$374.45
Minor street light	$0.61080	$223.09
G&EO		
Major street light	$0.41400	$151.21
Minor street light	$0.27120	$99.06

For 2015-16 Ergon Energy understands that customers will bear 10% of this cost - with the remainder borne by Government. For future years, Ergon Energy is unable to present the proportion to be paid by the customer because the Queensland government has yet to advise the transition path it proposes.

In its Preliminary Decision, the AER provided for prices to vary in subsequent years by the Consumer Price Index (CPI) – with no X factor. Ergon Energy has proposed that the AER account for differences between the revenue approved in the Preliminary Determination and those approved in the Substitute Determination via a 'true-up' mechanism which would adjust the prices in the remaining years of the regulatory control period. As a result it may be necessary for X factors to be applied. Further, we note that we have used the January 2015 version of the Post Tax Revenue Model (PTRM) for Street Lighting Services, which allows for a time-varying return on debt. Therefore, we question whether the AER intends to annually adjust for the return on debt as per the approach adopted for Standard Control Services (SCS).

With prices for 2015-16 locked in at Preliminary Decision levels, Ergon Energy has calculated two sets of prices for the revised Regulatory Proposal. That is, prices based on our revised Regulatory Proposal as if the transitional arrangements don't apply (expected price changes are presented in Table 2a) and prices reflecting the true-up mechanism necessary to account for the difference between the AER's Preliminary Determination and its Substitute Determination (expected price changes are presented in Table 2b).

The approach used for the true-up mechanism is largely consistent with the approach used in SCS through the use of X-factors. That is, X-factors are applied in order to smooth the annual revenue requirement over the regulatory control period. This is normally achieved by making a Year 1 adjustment, and holding the smoothing adjustments in Years 2 to 5 at a constant rate (i.e. a constant 'X'). In Ergon Energy's case, the X-factors can only be adjusted for the remaining four years of the regulatory control period (2016-17 to 2019-20). This is because the prices for 2015-16 have already been established through the annual Pricing Proposal process based on the AER's Preliminary Determination. Therefore, Ergon Energy has made an adjustment in Year 2 and applied a constant X (at CPI) over the remaining years of the regulatory control period.

Table 2a: Prices as if transitional arrangements did not apply

$ / day	2015-16*	2016-17	2017-18	2018-19	2019-20
EO&O					
Major street light	$0.98567	$1.01080	$1.03658	$1.06301	$1.09012
Minor street light	$0.59802	$0.61327	$0.62891	$0.64495	$0.66140
G&EO					
Major street light	$0.48902	$0.50149	$0.51428	$0.52739	$0.54084
Minor street light	$0.32211	$0.33032	$0.33874	$0.34738	$0.35624
% change					
EO&O					
Major street light	(20.50%)	+ CPI	+ CPI	+ CPI	+ CPI
Minor street light	(18.36%)	+ CPI	+ CPI	+ CPI	+ CPI
G&EO					
Major street light	(2.89%)	+ CPI	+ CPI	+ CPI	+ CPI
Minor street light	(1.35%)	+ CPI	+ CPI	+ CPI	+ CPI

Table 2b: Proposed changes to nominal prices using transitional arrangements

$ / day	2015-16*	2016-17	2017-18	2018-19	2019-20
EO&O					
Major street light	$1.02520	$1.03333	$1.05968	$1.08670	$1.11441
Minor street light	$0.61080	$0.62315	$0.63904	$0.65534	$0.67205
G&EO					
Major street light	$0.41400	$0.48058	$0.49283	$0.50540	$0.51829
Minor street light	$0.27120	$0.31607	$0.32413	$0.33240	$0.34088
% change					
EO&O					
Major street light	- 17.31%	+ 0.79%	+ CPI	+ CPI	+ CPI
Minor street light	- 16.61%	+ 2.02%	+ CPI	+ CPI	+ CPI
G&EO					
Major street light	- 17.79%	+ 16.08%	+ CPI	+ CPI	+ CPI
Minor street light	- 16.94%	+ 16.54%	+ CPI	+ CPI	+ CPI

* Because there was no distinction made in the 2010-15 regulatory control period between EO&O and G&EO it is not possible to do a simple % change between prices for 2014-15 and prices for 2015-16. However, for a customer with a mix of EO&O and G&EO street lights consistent with the overall inventory mix on the Ergon Energy network the price changes will be as shown in Table 2a and b above.

It should be noted that each customer is likely to have a slightly different mix of EO&O and G&EO street lights and, hence, a slightly different change in prices from the 'blended rate' that has applied in the past.

Included in these prices is a provision for the conversion of a portion of the existing street lighting asset base from existing technologies to Light Emitting Diode (LED) based technology. The amount provided each year for this program is $1 million – or around a 3% increase over the base revenue requirement. The primary purpose of this allowance is to provide for the scrapping of assets before the end of their normal operational life. Ergon Energy considers that LED street lighting is highly likely to be the appropriate technology for street lighting in the future, but is conscious that the technology is yet to be fully tested and proven in terms of field failure rates, ongoing maintenance benefits and public safety measures.

To further facilitate the transition program Ergon Energy has developed a set of 'exit fees' that will apply to street lighting assets scrapped as a consequence of replacement by LED technology outside the proposed transition initiative at the request of a customer. In its Preliminary Determination the AER approved the concept of an exit fee and the level of fees proposed by Ergon Energy. With revised inputs as set out in subsequent sections it is possible to justify a higher exit fee, but because Ergon Energy has already started to communicate the existence and level of the exit fee it is proposing to stay with the fees approved in the Preliminary Determination. These are shown in Table 3.

Table 3: Exit Fees

	Exit fee
EO&O	
Major street light	$1,390
Minor street light	$840
G&EO	
Major street light	$230
Minor street light	$195
Note: Exit fee <u>not</u> payable by customers where the proposed LED transition program is being implemented	

The LED transition program is aimed at both new and replacement lights. Use of LED technology will be subject to detailed evaluation based on a number of factors including age of the assets, prudency and cost benefit analysis. Where lights meet defined criteria for replacement with LED, the exit fee will not apply. The program will allow somewhere between 6,000 and 8,000 LED street lights to be introduced into the street lighting inventory (EO&O, G&EO) over the regulatory control period across multiple local government areas – with the 'cost of learning' equitably recovered from all street lighting customers.

The risk allocation implied by this approach is:

Participating LGAs	get lower running costs don't bear all the cost of scrapping existing lights risk subsequent technology being better than they adopt
Non-participating LGAs	bear part of the cost of scrapping existing lights defer adoption of LED until technology is proven in deployment

The existence of an exit fee means an LGA that wishes to move faster than provided by the transition program is able to do so. The structure of the exit fee is such that an LGA wishing to transition large numbers of street lights will be economically encouraged to do so with G&EO lights. The fee will only apply in situations where Ergon Energy considers it is not prudent or efficient to replace an existing light asset with residual value without a consideration for that value.

Generally, Ergon Energy will be replacing failed light assets on a 'like for like' basis during the 2015 to 2020 regulatory control period while it works with customers on proving the commercial and performance benefits of LED technology to allow broad scale deployment in future regulatory control periods with manageable risk.

2.5 The regulatory framework for street lighting

The following Queensland legislation is relevant to street lighting services:

Instrument	Content
Transport Infrastructure Act 1994 (Qld)	This legislation provides for declaration of roads – they are then the responsibility of the Department of Transport and Main Roads

The following industry standards are relevant to street lighting services:

Instrument	Content
Australian Standard AS/NZS1158 Lighting for Roads and Public Spaces	AS/NZS1158 sets standards for illumination and for reliability that Ergon Energy uses to plan its maintenance programs for street lighting assets.

The following internal standards are relevant to street lighting:

Instrument	Content
Standard for Public Lighting Assets	Joint working document Ergon Energy/ Energex Section 7 – In Service Condition Assessment (ISCA)
Standard for Preventative Maintenance Programs 2014-15	Details the inspection and maintenance programs that will be conducted during the period detailed.

The following electricity industry legislation and regulation is relevant to street lighting services:

Instrument	Content
National Electricity Law (NEL) and National Electricity Rules (NER)	The NEL is the legislation that governs the Australian electricity sector. It establishes the responsible institutions including the Australian Energy Market Commission (AEMC) and the AER. The NEL makes AEMC responsible for making and updating the NER. Chapter 6 of the NER sets out the general framework by which the AER is to regulate the distribution sector.
Final Framework and Approach for Energex and Ergon Energy – Regulatory Control Period commencing 1 July 2015 (Framework and Approach)	This document was issued by the AER in April 2014 pursuant to chapter 6 of the NER. It classifies public lighting services as a Direct Control Service and thereby requiring a prescriptive approach to price setting. It then sub-classifies public lighting services as an ACS – that is a service that is customer specific or customer requested. The AER indicates that it will "determine prices for individual alternative control services in a variety of ways, suitable to specific circumstances".
Regulatory Information Notice (RIN)	This document was issued by the AER and sets out the information Ergon Energy is required to provide to allow the AER to make a distribution determination for the regulatory control period commencing on 1 July 2015 and ending on 30 June 2020. It makes specific reference to public lighting services at paragraph 15. In general, the AER requires the same type of information in relation to operating expenditure, capital expenditure and the underlying assets as it requires in relation to other parts of Ergon Energy's regulated distribution business.

2.6 The street lighting asset base

Table 4 provides a summary of the existing street lighting asset base. This table is based on updated numbers following resolution of all but a small number of disputed lights arising out of the audit.

Table 4: Street lighting physical asset base at 1 July 2015

	Ergon Energy owned and operated	Gifted and Ergon Energy operated	Sub total	Owned by others	Total
Number of street lights	90,051	50,685	140,736	14,834	155,570
By output level Major (100W, 150W, 250W and 400W HPS)	23,828	13,371	37,199	11,671	48870
Minor (50W, 80W, 125W MV, and 70W HPS)	66,223	37,314	103,537	3,163	106,700

As noted in the previous section, what in future will be charged to customers as an ACS charge has been 'hidden' by arrangements pursuant to the UTP – or, in the more recent past, borne by the Queensland government as part of the CSO.

These arrangements resulted in Ergon Energy managing street lighting assets at a disaggregated level for operational and maintenance purposes, but not keeping the sort of financial and other records that would readily enable the development and administration of ACS charges being borne directly by the parties who are accessing the service.

Recognising the substantial deficiencies, Ergon Energy has been working with its customers to significantly improve the quality and accuracy of its street lighting asset records through a geo-spatial data collection process and a state wide audit of street lighting assets. All LGAs with more than 200 street lights within their boundaries were included in the audit process.

Table 5 provides a summary of the physical asset base that was believed to exist at the time the decision for the 2010-15 regulatory control period was determined – and then the number of street lights confirmed in existence by the audit process. Table 5 does not include the street lights that are owned by others.

Table 5: Street lighting physical asset base – history

2005-10 regulatory control period	2005-06	2006-07	2007-08	2008-09	2009-10
Actual (from the AER Determination)	117,481	117,660	122,144	118,256	123,440
2010-15 regulatory control period	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
AER Determination	123,140	124,626	126,131	127,656	129,200
Actual / Estimate From FACOM system Audit adjustment LightMap system †	130,464	132,305	134,951	138,595 855 139,450	 (1,046) 140,736

† LightMap is a customer portal based on a 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).

The audit involved driving the regional Queensland road network. All street lights (and possible street lights) were identified, geographically located, and labels photographed. The lamp type was recorded from a stencil on the luminaire (or recorded unknown) and various other attributes were carefully noted.

A dedicated team cleansed the data to remove watchman lighting (an unregulated service) and recorded items obviously not street lights. Records were then geographically allocated to LGA areas. Those records located within 5 metres of the centreline of a State Road Corridor were then allocated to the DTMR.

The databases created were sent to each LGA and to DTMR for review. Over a period of 12 months the parties reviewed the data and negotiated between themselves (LGAs and DTMR) regarding ownership and billing responsibility and provided independent responses back to Ergon Energy.

At the time Version 1 of this overview document was prepared there were less than 1% of lights with disputed ownership or billing responsibility. Ergon Energy has continued to facilitate resolution of these disputes and there are now fewer than 200 disputed lights. For the purposes of this paper the remaining disputed lights have been allocated to DTMR.

In addition, a number of lights have been identified that are privately owned (e.g. non street light customer = Port Authority, aged care facility or metered lights). These have been removed from the street light fleet.

In addition to the opportunity LGAs and DTMR have had to review the information going into the new LightMap system they will have continuing access to the database to monitor the information that will be used to manage the street lighting asset base and to do the ACS billing in the future.

Table 7 details information about the financial asset base that has been used by the QCA and the AER to set prices for the 2005-10 and 2010-15 regulatory control periods. It also shows the forecast asset base for the 2015-20 regulatory control period.

Table 7: Street lighting asset base (nominal dollars - millions)

2005-10 regulatory control period	2005-06	2006-07	2007-08	2008-09	2009-10
Actual	46.5	52.9	59.1	66.0	67.1
2010-15 regulatory control period	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Actual / Estimate	69.1	72.2	76.8	78.2	78.2
2015-20 regulatory control period	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Regulatory Proposal	84.5	89.1	94.5	100.0	106.0

The trend shown in Table 7 of an increasing asset base is substantially due to the adoption of depreciation policies applied by the AER in its Preliminary Determination. Ergon Energy is concerned that such a trend is inconsistent with the underlying realities of the street lighting sector where distributors face a steadily increasing risk that its existing fleet of street lights will be stranded as customers demand a move to LED technology.

In Version 1 of this document Ergon Energy proposed depreciation rates that would have maintained the value of the asset base at around the current level. Ergon Energy is concerned that the rise in asset base mandated by the AER materially increases the risk that it will eventually be unable to recover its prudently incurred capital costs.

2.7 Expenditure profile

Table 8 and Table 9 detail information about Ergon Energy's street lighting operating expenditure and capital expenditure for the 2005-10, 2010-15 and 2015-20 regulatory control periods:

- The street lighting forecasts that Ergon Energy:
  - presented in its regulatory proposals, and revised regulatory proposals, to the Queensland Competition Authority (QCA) for the 2005-10 regulatory control period and to the AER for the 2010-15 regulatory control period
  - is now presenting in its regulatory proposal to the AER for the 2015-20 regulatory control period.
- The QCA's and the AER's street lighting allowances for the 2005-10 and 2010-15 regulatory control periods respectively
- Ergon Energy's actual and estimated street lighting operating expenditure and capital expenditure for the 2005-10 and 2010-15 regulatory control periods.

Table 8: Street lighting operating expenditure (nominal dollars - millions)

2010-15 regulatory control period	2010-11	2011-12	2012-13	2013-14	2014-15	Total
AER Determination	14.0	14.0	14.1	14.6	15.1	71.8
Actual / Estimate	8.4	11.8	9.9	10.4	10.0	50.5
Variance	(5.6)	(2.2)	(4.2)	(4.2)	(5.1)	(21.3)
2015-20 regulatory control period	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Total**
Revised Regulatory Proposal	12.5	13.4	14.2	14.9	15.6	70.5

Table 9: Street lighting capital expenditure (Nominal dollars - millions)

2005-10 regulatory control period	2005-06	2006-07	2007-08	2008-09	2009-10	Total
Actual	2.9	10.2	9.7	11.9	8.6	43.3
2010-15 regulatory control period	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**Total**
AER Determination	4.6	4.7	4.8	4.8	4.9	23.8
Actual / Estimate	7.3	10.2	11.6	8.8	8.7	46.7
Variance	2.7	5.5	6.8	4.0	3.8	22.9
2015-20 regulatory control period	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Total**
Revised Regulatory Proposal	10.3	11.0	11.2	12.0	13.1	57.7

Table 8 and Table 9 show that:

- Ergon Energy's understanding of the pattern of operating expenditure and capital expenditure incurrence on street lighting was inadequate at the time ACS prices were set for the first time in 2009; and
- the operating expenditure underspend during the 2010-15 regulatory control period has been similar in scale to the overspend on capital expenditure.

The detailed breakdowns of operating expenditure and capital expenditure forecasts required by para 15 of the Reset RIN are included in the Reset RIN.

2.8 Street lighting imperatives

The most important issues that have influenced how Ergon Energy has settled on the plans and forecasts described later in this document are:

- Imperative 1: Street lighting performance to agreed standards – the ongoing importance of street lighting to the safety of the public as motorists and pedestrians is clearly recognised
- Imperative 2: A fully functional customer portal (LightMap system) – effective utilisation of the street light data from the recent audit and the work arising from that. This work has been required to remedy past deficiencies in the completeness and accuracy of street lighting asset records. Its completion and the associated development of the LightMap software will provide Ergon Energy and its street lighting customers (ACS and retail) with a system framework for efficiently managing street lighting assets
- Imperative 3: prepare for and commence the LED transition – Ergon Energy recognises the ongoing issue of the costs associated with street lighting. LED based technology has been recognised as having the capacity to reduce street lighting costs in a number of ways. LED technology has improved rapidly over the past 5 years to the point it is starting to be used in mass deployment programs. In the local context, a number of technical, regulatory and financial matters need to be worked through.

These imperatives have been the most important influences on the plans set out in this overview document.

3. Street lighting strategy

This section describes the underlying strategy for street lighting. It draws on a document titled Street Lighting Strategy that has been separately submitted to the AER.

3.1 Process

As an asset class, street lights have challenged Ergon Energy with jurisdictional overlaps, legacy management systems and complex charging regimes creating challenges for the company and its street lighting customers.

In 2013, Ergon Energy completed a geo-spatially based street light audit program and now has a new database of records recorded in a new system known as LightMap. This has substantially improved the ability to efficiently manage and bill for street lighting. Street lighting customers will have their own access to the LightMap system and the data for the street lighting (LGA and DTMR) in their area of responsibility.

The customer engagement program that has supported the street light audit and LightMap system implementation has made plain the need for a street lighting strategy with a strong level of customer support and engagement. The 'Street Lighting Strategy' document is designed to meet that need.

The strategy has three elements at its core:

- proactive management of the existing street lighting stock such that street lighting performance standards continue to be met
- provision of an enhanced level of customer engagement with the LightMap system at its core
- working systematically through the technical, regulatory and financial challenges to the mass adoption of LED technology such that mass rollout based on positive cost benefits and greater performance certainty can be supported in the subsequent regulatory control period (2020 to 2025) or earlier if justified.

3.2 Managing the legacy

Ergon Energy recognises the important public service of providing street lighting to illuminate roads across its substantial distribution footprint.

Maintenance is carried out through two programs: preventative and corrective/forced maintenance which include Major Road Light Patrols, Bulk Lamp Replacement, Pole Inspection, as well as forced and corrective maintenance activities. These programs are described in Section 5.

3.3 Customer engagement

As well as supporting Ergon Energy's efficient management of its street lighting assets, LightMap 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 supports Ergon Energy's objective of achieving industry best practice in street light management. As a follow on, service levels with street light customers are now under development and will provide clarity for both the customer and Ergon Energy on street lighting responsibilities.

Ergon Energy is increasing its level of stakeholder engagement with street lighting customers moving forward to ensure increasing collaboration on key public lighting agendas. The intent is for joint development of street light management practices, increased focus on sustainable cost paths and ensuring community support for new technologies such as LED.

During the 2015-20 regulatory control period Ergon Energy will continue to build on this deeper and more constructive customer engagement.

3.4 Creating a pathway for LED

Street lighting customers are increasingly requesting the introduction of more efficient lighting technologies, particularly LED. Ergon Energy considers that, based on international evidence and its own involvement in LED trials, the future technology for public lighting is almost certainly going to be LED. The rapid rise of LED and significant improvements in performance quality means that there is a risk of interim technologies being stranded in the current inventory if the transition and stakeholder expectations are not managed effectively. This would be a less than ideal outcome for customers.

Accordingly the Ergon Energy 'Street Lighting Strategy' acknowledges the trend to LED and proposes a comprehensive plan to enable a pathway to this future. This plan includes the key principles of prudency and efficiency across the three themes of Understanding, Developing and Implementing. This plan involves addressing the requirements for adoption at three levels:

Technical

There are legitimate technical considerations in relation to the widespread adoption of LED street light technology. These relate to the learning cycle that inevitably accompanies a new technology – or, as in the present case, a maturing technology in a new, performance sensitive application.

It is likely given the nature of the LED technology that Ergon Energy will use a mix of internal and independent assessment methods. Accordingly, it will be necessary to undertake a blend of pilots and trials (with a degree of independent validation) and connect with national and international trials as well.

Regulatory

Ergon Energy has an obligation to meet the requirements as set out in *AS/NZS1158:2010.* Although a revision of the standard is pending, further technical changes may be required to the standard to adjust for the widespread deployment of energy efficient LED technology.

There are other regulatory implications of adopting LED technology including:

- Tariff – the recognition of the LED product on AEMO load table to enable energy calculations;
- ACS – the ability to adjust ACS charges by customer geography;
- A means by which any residual capital cost for old technology can be equitably recovered in accelerated deployment options (e.g. defined end-of-life and customer driven bulk deployment).

Financial

Currently LED street light luminaires are more than twice the cost of a conventional replacement luminaire. However, the price glide path for LED is estimated to be a 15-20% reduction per annum. This means within the 2015-20 regulatory control period there is a probability that LED pricing will be close to parity with conventional lighting procurement and installation costs. In addition, forecast energy savings in the order of 50-60% and longer life (50,000 hours) means that the whole-of-life cost of LED seems certain to provide significant energy and maintenance benefits.

Ergon Energy proposes a measured (but reasonably substantial) level of investment in LED based street lighting during the next regulatory control period on the following basis:

- the use of LED for new street lighting installations (EO&O, G&EO):
    - as soon as regulatory requirements have been cleared and appropriate distribution and retail tariffs have been developed
    - once appropriate LED technologies are part of the approved Ergon Energy standard luminaire stock
    - when the street lighting customers specifically agree to the deployment of LED technology
    - there is no countervailing operational imperative to use an existing technology.
- specific provision for the conversion of targeted existing street lighting to LED technology where existing assets may not have reached the end of their useful lives on the basis that:

- the cost of the early retirement of the scrapped assets and higher upfront capital costs of LED technology where built by Ergon Energy (for the short term until LED costs reach parity with existing technology or the whole of life cost benefit is understood) will be added to the street lighting revenue requirement
- the cost of the scrapped assets be spread across all street lighting customers through ACS charges rather than be paid only by the customers using the replacement LED street lighting assets as part of the 'proof of concept' phase proposed for the 2015 to 2020 regulatory control period
- the lights to be converted under this program to be agreed between Ergon Energy and its street lighting customers
- the LED conversion program to be capped at the level provided in the revenue requirement – other than by the mechanism described next.

- where a street lighting customer wishes to have street lighting converted above and beyond the funded LED conversion program, the customer may initiate such a change provided that:
  - the LED technology the customer wishes to deploy has been approved for use and appropriate distribution and retail tariffs have been approved
  - the customer pays an exit fee in respect of street lighting scrapped as required.

The purpose of this proposal is to provide for a level of investment in LED based street lighting such that a much broader conversion program can be included in Ergon Energy's proposal for the 2020 to 2025 regulatory control period.

As noted above and set out subsequently, an amount of $1 million per annum (pa) has been provided in the revenue requirement for this proposed program through a nominal addition to the regulatory depreciation allowance.

4. Customer engagement plan

As a result of the recent audit of all street lighting assets connected to its network, Ergon Energy has been engaged with its street lighting customers. As the process of working through asset records works towards completion, there will be three coordinated customer engagement processes that will continue through the 2015-20 regulatory control period. They are:

- completion of the process of reviewing audit findings and embedding the use of the LightMap system such that both Ergon Energy and customers have access to an accurate and functional asset register
- completion of service levels for all street lighting customers and progression towards industry best practice in street lighting management
- regular dialogue on the LED transition – both in relation to the investments being made during the next regulatory control period and the planning for further conversion during the subsequent regulatory control period.

Each of these customer engagement processes is explained in turn.

4.1 Customer Portal - LightMap

The implementation of the Street Lighting Customer Portal, currently LightMap, is already well advanced. Ergon Energy is committed to ongoing development of the portal and to the concept of

continuous customer access to its key asset records. The LightMap system provides a number of functions and benefits including:

- identification of street lights by geography for each customer
- easier management of customer account information
- dashboard messaging from the customer portal
- complete transparency of assets in the customer's footprint and an ability to resolve areas of overlap
- reporting of consumption, asset age, type and class and billing reports for financial management on the customer side.

4.2 Service levels

A generic service level for street lighting customers is under development and will provide clarity for both the customer and Ergon Energy on street lighting responsibilities.

Ergon Energy will publish a street lighting service level and review it annually. The service level will detail service standards 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 level. In these instances, street lighting customers will need to negotiate a variation to the standard service level. Ergon Energy will make best endeavours to accommodate these variations subject to regulatory arrangements.

The street lighting customer service level will cover:

1. Street lighting design compliance

- processes for new street lighting design
- responsibilities for compliance with Australian standards for street lighting upgrades

2. Asset inventory

- application of LightMap
- notification process for service installation and abolishment

3. Maintenance

- 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

4. Choice of light fittings, lamps and lighting standards

- implementing criteria to consider capital investment in new technologies
- cost versus benefit analysis, including a whole of society consideration
- compatibility with existing technology including the spatial distribution of light

- whole of life evaluation of useful luminaire lifetime
- consideration of effects on existing preventative maintenance programs

4.3 Dialogue on LED transition

Ergon Energy is already actively involved in a variety of programs aimed at assessing the readiness of LED technology to become the dominant form of street lighting.

On approval of the LED transition program and clearance of the technical and regulatory requirements that currently impede deployment of LED technology, Ergon Energy will engage with DTMR and its LGA customers to identify street lighting assets that may be subject to early replacement under this program. To assist with this process Ergon Energy will develop application processes and indicate clearly to its customers the basis on which participation will be determined.

5. Street lighting maintenance plans / operating cost forecasts

Ergon Energy will operate its street lighting network, efficiently and effectively over the economic life in accordance with in-service values specified for Category V and Category P lighting detailed in *AS/NZS1158:2010* "*Lighting for Roads and Public Spaces*". The approach to be taken to operation of the street lighting network is also described in a document titled 'Network Optimisation Public Lighting Management Plan'.

Street lighting maintenance is carried out using an approach whereby there are programs at two levels:

- Preventative
- Corrective and forced.

5.1 Preventative maintenance programs

Preventative maintenance of street lighting in Ergon Energy comprises the following scheduled inspection and maintenance activity; road patrol, bulk lamp replacement (BLR) program and pole inspection. Table 10 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 reviewed annually and details the inspection and maintenance programs that will be conducted during the period detailed.

Table 10: Current preventative maintenance programs

Program Name	Interval or Criteria
Road Patrol Program	
Routine street light patrols	One night patrol of major roads (where there are more than 200 lights) and defined pedestrian crossing or intersections 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	4 year cycle
Wood pole rural (high rainfall)	
Steel pole (direct buried urban/coastal)Wood pole rural	
Steel pole and tower	6 year cycle
Concrete pole	8 year cycle

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

Only LGA areas where there are more than 200 major road street lights will undergo a road patrol and a BLR. All other areas are part of the BLR program only.

5.2 Corrective and forced maintenance

The BLR program ensures all lamps (major and minor) are replaced once every three years. While the street light patrol program serves to provide a further avenue for identification of asset failure and rectification at the point of inspection for lights on major roads, the only catalyst for replacing failed lamps outside the BLR program for minor road lights is generally reporting of failures by the public and street lighting customers.

5.3 Opex forecasting methodology

Ergon Energy has prepared its forecast operating costs for its street lighting services for the 2015-20 regulatory control period using a base-step-trend methodology. This is the same approach that it has used to prepare its operating costs forecast for SCS. This is consistent with the AER's preferred approach to forecasting operating costs as set out in its Expenditure Forecast Assessment Guideline.

At a high level, this process involves establishing a base year operating cost estimate derived from actual (or revealed) expenditure, which is adjusted for costs that are:

- non-recurrent in nature
- related to movements in provisions
- deemed to be not efficient.

Ergon Energy has applied a further efficiency adjustment to the base year, representing an early return to customers of the benefits from the ongoing efficiency programs we intend to pursue over the course of the next regulatory control period.

The ‘efficient base year’ costs are then rolled forward into forecast years, allowing for change factors, which account for:

- output growth
- productivity growth
- real price growth.

Any recurrent step changes in underlying cost categories are also added to the forecast in the year to which they commence.

The high level steps undertaken within the base-step-trend approach are depicted in Figure 3.

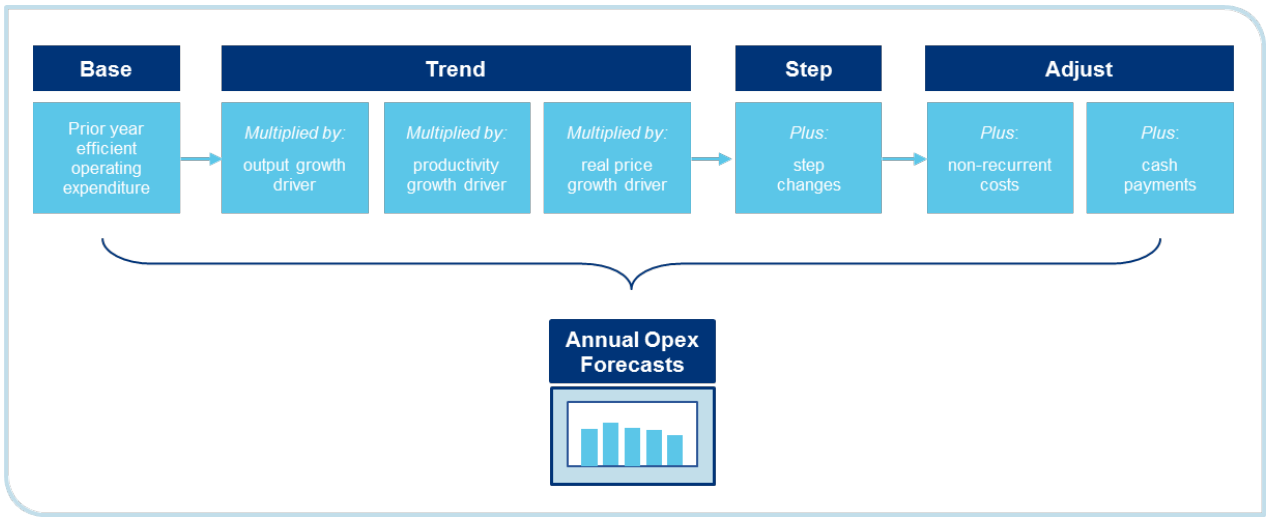

Figure 3: Base step trend methodology

Ergon Energy has explained and justified its approach to preparing its operating expenditure forecast, using the base-step-trend methodology in a separate document entitled ‘Opex Summary Document’. This covers both Ergon Energy’s SCS and street lighting services.

As a consequence, in order to avoid duplication, this “Street Lighting Summary” document simply details the expenditure forecasts for street lighting that are an outcome of the application of this methodology. The reader should refer to the ‘Opex Summary Document’ for details of how this forecast has been prepared and justified.

Paragraph 15.2 of the Reset RIN requires Ergon Energy to provide forecasts of unit costs relevant to certain street lighting assets. This information is provided in Ergon Energy’s ’Regulatory Reset RIN Response Paper’. These unit costs have not directly been used to prepare Ergon Energy’s operating cost forecast for street lighting, as it has prepared its forecast using a base-step-trend methodology.

5.4 Forecast operating costs

Ergon Energy’s forecasts of operating costs are summarised in Table 11 and described more fully in the ‘Network Optimisation Public Lighting Management Plan’ and the Reset RIN.

Table 11: Operating cost forecasts (nominal $)

2010-15 regulatory control period	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Preventative maintenance	3.9	6.0	4.5	4.8	4.6	23.8
Corrective and forced	4.5	5.8	5.3	5.6	5.4	26.7
Total	8.4	11.8	9.9	10.4	10.0	50.5
2015-20 regulatory control period	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Total**
Preventative maintenance	6.6	7.1	7.5	7.9	8.3	37.5
Corrective and forced	5.8	6.2	6.5	6.8	7.2	32.5
Debt raising costs	0.1	0.1	0.1	0.1	.01	0.5
Total	12.5	13.4	14.2	14.9	15.6	70.5

6. Street lighting investment plan / capital expenditure forecasts

Ergon Energy's commitment to a measured transition to the use of LED technology for new and some replacement lights represents a substantial change to past patterns of street lighting capital expenditure. The practical implications of this change are set out in this section.

6.1 LED transition planning and preparation

As described earlier, Ergon Energy considers that based on international evidence and its own involvement in LED trials the future technology for street lighting will be LED. The rapid rise of LED and significant improvements in performance quality means that there is a risk of interim technologies being stranded in the current inventory. This would be a less than ideal outcome for customers.

Accordingly the Ergon Energy Street Lighting strategy acknowledges the trend to LED and outlines a high level plan to enable a pathway to this future. This plan includes the key principles of prudency and efficiency across three themes of Understanding, Developing and Implementing. The strategic framework provides avenues for management of risks by progressing towards broad LED technology application in a methodical and systematic way. At each stage the technical, regulatory and financial aspects will be carefully considered. In recognition of the progress made in other jurisdictions, the development of these evaluation methods and processes will take into consideration lessons already learnt nationally and internationally. New regulations will be required to reflect the nature of LED technology. Ergon Energy will diligently work towards the development of new regulations.

6.2 Refurbishment, replacement and withdrawal of street lighting assets

Each year customers request that a number of street lights be withdrawn from service. The history of such withdrawals and the forecast for withdrawals in the next regulatory control period are as shown in Table 12.

Table 12: Street light withdrawals

History / estimate	2010-11	2011-12	2012-13	2013-14	2014-15
Major	1,090	1,228	984	560	1,040
Minor	1302	1762	1342	466	1,125
Forecast	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Major	1,040	1,040	1,040	1,040	1,040
Minor	1,125	1,125	1,125	1,125	1,125

6.3 New street lighting assets

Ergon Energy's historical demand for new street lights (EO&O, and GO&O) and its forecasts of demand for new street lights is as shown in Table 13.

Table 13 Street light additions

History / estimate	2010-11	2011-12	2012-13	2013-14	2014-15
Major	1,321	1,812	1,692	1,693	1,610
Minor	2358	3019	3,280	2,977	2,888
Forecast	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Major	1,610	1,610	1,610	1,610	1,610
Minor	2,888	2,888	2,888	2,888	2,888

Data deficiencies in asset systems mean that only 2013-14 additions are based on rigorously cross checked data sources. Additions for the previous 3 years have been estimated based on the best available engineering sources. Forecasted additions are based on the 2013-14 work which involved multiple systems and the uncovering and correction of a number of practical operational issues related to record keeping.

For the future the existence and operation of LightMap will provide Ergon Energy and its street lighting customers with an authoritative core information system that will ensure that better data is available moving forward.

Ergon Energy's proposed approach to demand for new street lights will be to suggest to customers that they use mainly well proven and reliable technologies. For a variety of reasons it is not reasonable to assume that all, or even a majority of, new street lights will be LED until further experience has been accumulated.

6.4 LED transition plan

Ergon Energy expects to be able to commence the LED transition plan during 2015-16.

The LED transition program included in the revenue requirement allows for a material investment to be made in the deployment of LED technology. The exact amount will depend on the availability and price path of LED lights and their performance in service.

6.5 Forecast capital expenditure costs

The two components of Ergon Energy's street lighting capital expenditure have been forecast as components of its broader forecasts (including for SCS) that are detailed in its:

'Asset Renewal Summary Document' – this covers capital expenditure relating to the refurbishment and replacement of assets, of which street lighting is a sub-category; and

'Customer Initiated Capital Works Summary Document' – this covers new customer connections, of which street lighting is a sub-category. It comprises both capital expenditure incurred by Ergon Energy, as well as capital contributions (which includes both gifted assets and cash contributions).

As a consequence, in order to avoid duplication, this "Street Lighting Summary" document simply details the expenditure forecasts for street lighting that are an outcome of the application of the methodologies that are described in these two Summary Documents. The reader should refer to these other documents for details of how the capital expenditure forecast for street lighting has been prepared and justified.

Table 14: Capital cost forecasts

2015-20 regulatory control period	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Customer initiated						
Directs costs	15.0	15.8	16.6	17.3	18.1	82.9
Overhead	6.4	7.4	8.4	9.2	9.9	41.3
Capital contributions	(14.8)	(16.0)	(17.2)	(18.3)	(19.2)	(85.5)
Net new street lighting capital expenditure	6.7	7.2	7.8	8.2	8.7	38.6
Asset replacement/refurbishment						
Directs costs	2.6	2.6	2.3	2.4	2.9	12.7
Overhead	1.1	1.2	1.2	1.3	1.6	6.3
Total	10.3	11.0	11.2	12.0	13.1	57.7

7. Street lighting services revenue requirement

Part C of Chapter 6 of the NER details the building block approach that must be used to forecast the annual revenue requirement for Ergon Energy's SCS for the 2015-20 regulatory control period. Ergon Energy has adopted the same building block approach to forecast its annual revenue requirement for street lighting services for the 2015-20 regulatory control period. The four building blocks are operating expenditure, return on assets, return of assets (deprecation) and tax.

Ergon Energy has prepared a revenue and pricing public lighting model. It has linked this model to the AER's PTRM to prepare the annual revenue requirements for street lighting services. Ergon Energy has provided these models to the AER with this Street Lighting Summary document.

This section sets out the asset roll forward for the 2010-15 regulatory control period and the revenue requirement resulting from the application of the PTRM.

7.1 2010-15 period comparatives

Table 15 below shows the street lighting services revenue requirement approved by the AER for the current regulatory control period.

Table 15: Street lighting revenue requirement for the 2010-15 regulatory control period

2010-15 regulatory control period	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Opex	14.0	14.0	14.1	14.6	15.1	71.8
Return on assets	6.8	6.7	6.5	6.3	6.1	32.4
Return of assets	6.3	6.8	7.3	7.9	8.4	36.7
Tax	0.8	0.8	0.8	0.8	0.8	4.0
Total	27.9	28.3	28.7	29.6	30.5	145.0
Total smoothed	27.1	28.0	29.0	30.0	31.1	145.2

This information is provided for comparative purposes.

7.2 Street lighting services asset roll forward

Table 16 shows the asset roll forward starting from the roll forward value approved by the AER for the 2010-15 regulatory control period:

Table 16: Street lighting asset roll forward to start of 2015-20 regulatory control period

2010-15 regulatory control period	2010-11	2011-12	2012-13	2013-14	2014-15
Opening balance	69.7	71.6	74.4	78.8	80.0
Net capital expenditure	7.3	10.2	11.6	8.8	6.7
Regulatory depreciation	(5.5)	(7.3)	(7.2)	(7.6)	(9.2)
Closing balance	71.6	74.4	78.8	80.0	77.6

7.3 Street lighting services revenue requirement

Table 17 shows the revenue requirement resulting from the use of the PTRM.

Inputs used in the PTRM that are not explained in this document (e.g. Weighted Average Cost of Capital) are explained in other documents accompanying the revised Regulatory Proposal.

Table 17: Street lighting services revenue requirement for the 2015-20 regulatory control period

2015-20 regulatory control period	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Opex	12.5	13.4	14.2	14.9	15.6	70.5
Return on assets	5.7	6.3	6.6	7.0	7.4	33.0
Return of assets	4.9	6.7	6.1	6.7	7.5	31.8
Tax	4.3	4.5	4.5	4.5	4.5	22.3
LED transition program	1.0	1.0	1.0	1.0	1.0	5.0
Total	28.4	31.7	32.4	34.1	35.9	162.6

Source: PLPricing Model

The increase in the revenue requirement for the next regulatory control period is primarily a function of the increase in the proposed tax amounts for street lighting due to the recognition of forecast annual capital contributions for street lighting for the 2015-20 regulatory control period. Ergon Energy acknowledges that the transitional requirements relating to the treatment of capital contributions only applied to SCS up to 30 June 2015, and that from 1 July 2015 SCS capital contributions will be netted from the forecast capex in each regulatory year consistent with the AER's PTRM Guidelines and Handbook. However, for the purposes of consistency, Ergon Energy has taken the same approach to recognising capital contributions for street lighting in the street lighting PTRM, as there is appears to be no compelling reason for taking a different approach to that for SCS capital contributions.

Ergon Energy is proposing a reduction in the allowance for operating costs of $1.3 million on a nominal basis over the allowance made in 2009. That operating expenditure allowance was underspent – but was offset (on a cash basis) by a similar overspend on the capital expenditure allowance.

The higher than allowed capital costs of additions and the refurbishment of existing assets has, been reflected in capital expenditure forecasts – and into the return on and of assets.

The LED transition program has been referred to earlier in this document. It is proposed to be funded by a nominal addition to the regulatory depreciation allowance of $1 million pa.

While the revenue requirement for the 2015-20 regulatory control period has increased over the current period, a greater than proportional increase in the number of street lights means that the prices proposed in the next section involve a real (and nominal) decrease.

8. Proposed street lighting ACS prices

In this section Ergon Energy sets out the pricing approach and prices proposed for the 2015-20 regulatory control period. These prices are an output of Ergon Energy's public lighting model.

The AER's Framework and Approach paper established the control mechanism and the formula for Ergon Energy's different services. For street lighting the AER has required a price cap form of control and formula to apply. In addition to the information set out in this document, our supporting document *04.01.00 – (Revised) Compliance with control mechanisms* provides further detail on how we propose to comply with the control mechanism and formula set out in the AER's Framework and Approach paper.

8.1 Previous and current period comparatives

Table 18 shows the street lighting services prices approved by AER for the 2010-15 regulatory control period.

Table 18: Street lighting services prices for 2010-15 regulatory control periods ($ / light / day)

2010-15 regulatory control period	2010-11	2011-12	2012-13	2013-14	2014-15
Major					
• East	0.84	0.89	0.93	0.97	0.97
• West	0.84	0.89	0.93	0.97	0.97
• Mount Isa	0.84	0.89	0.93	0.97	0.97
Minor					
• East	0.50	0.53	0.55	0.58	0.58
• West	0.50	0.53	0.55	0.58	0.58
• Mount Isa	0.50	0.53	0.55	0.58	0.58

These prices are provided for comparative purposes and exclude GST

8.2 Pricing methodology – street lighting use of system ACS charge

There are 3 dimensions on which the charges for street lighting services can potentially vary. They are:

- by type of light – that is major vs minor;
- by ownership basis – that is EO&O vs G&EO; and
- by geography – that is East vs West vs Mount Isa

The relatively poor state of historical asset records in relation to street lighting compromised Ergon Energy's capacity to provide separate prices for either the ownership or geographic dimensions at the time charges for the current regulatory control period were set. The practical impact of this was limited by the effect of UTP and CSO arrangements – in that the Queensland government bore the entire cost of the ACS charge up until 30 June 2014, after which customers paid 10% of the charges.

The government's decision that customers should bear street lighting charges directly makes it essential that the pricing basis be reconsidered. Ergon Energy proposes that for the 2015-20 (and subsequent) regulatory control periods it will provide separate charges for:

- Major vs Minor – as in the past; and
- EO&O vs G&EO.

The field audit process completed during 2013 has provided a reliable database of current numbers on this basis. Ergon Energy is committed to maintaining this database in future. In this, it will be assisted by the decision to open LightMap to customer use.

The cost allocations that are necessary to produce disaggregated ACS prices would most appropriately be based on detailed historical records and future forecasts. In the present case these are not available and a modified approach to cost allocation has been adopted – as described below:

1. The revenue requirement has been divided into an assets cost pool and an operations cost pool.
2. The assets cost pool has been sub-divided into that part related to new assets and that part related to the refurbishment of existing street lighting assets.
3. For each cost pool a single factor has been used to allocate cost between major and minor lights.
4. A series of price components are then calculated using the average number of lights in each category for each year of the next regulatory control period as follows:

	E&EO		G&EO	
	Major	Minor	Major	Minor
Asset cost pool (original cost)	X	X	-	-
Asset cost pool (refurbishment)	X	X	X	X
Operating cost pool	X	X	X	X

5. The sum of cost components produces prices for each year of the next regulatory control period. As described above, two sets of prices have been developed: one assuming transitional requirements under the NER don't apply; and one applying a true-up mechanism to adjust for the difference between the AER's Preliminary Determination and Substitute Determination.
6. For prices reflecting the transitional arrangements, prices published by the AER in its Preliminary Determination using this methodology (but different inputs) are to be used for the 2015-16 year.
7. In accordance with the true-up mechanism, prices calculated for year 2 of the 2015-20 regulatory period are then scaled using a single adjustment factor. Thereafter prices will increase by CPI. The scaling factor is set such that the amount of revenue expected to be earned is equal in Net Present Value to the revenue requirement.

Ergon Energy has considered whether it is appropriate to charge a different tariff for street lights using LED technology. The rationale for adoption of LED technology is its expected impact on the life cycle cost of street lighting at three levels:

- immediately on the level of energy used, which is expected to be reflected in lower consumption for LED street light types to be added to AEMO load tables
- in the future on the level of maintenance required
- in the future on the level of capital cost.

In the absence of information that would allow an evidence based variation on the basis of maintenance or capital cost, Ergon Energy believes that street lighting services provided by LED

technology should remain at the same level as other street lighting technologies. It will revisit this issue in the light of learning from the proposed LED transition program.

The resulting prices are as follows in Table 19:

Table 19: Proposed street lighting ACS charges – nominal $

Before application of transition arrangements

$ / day	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy owned and operated					
• Major	0.98567	1.01080	1.03658	1.06301	1.09012
• Minor	0.59802	0.61327	0.62891	0.64495	0.66140
Gifted & Ergon Energy operated					
• Major	$0.48902	$0.50149	$0.51428	$0.52739	$0.54084
• Minor	$0.32211	$0.33032	$0.33874	$0.34738	$0.35624
$ / year	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy owned and operated					
• Major	360.02	369.19	378.61	388.26	398.17
• Minor	218.43	224.00	229.71	235.57	241.58
Gifted & Ergon Energy operated					
• Major	178.61	183.17	187.84	192.63	197.54
• Minor	117.65	120.65	123.72	126.88	130.12

After application of transition arrangements

$ / day	2015-16	2016-17	2017-18	2018-19	2019-20
Ergon Energy owned and operated					
• Major	1.02520	1.03333	1.05968	1.08670	1.11441
• Minor	0.61080	0.62315	0.63904	0.65534	0.67205
Gifted & Ergon Energy operated					
• Major	0.41400	0.48058	0.49283	0.50540	0.51829
• Minor	0.27120	0.31607	0.32413	0.33240	0.34088
$ / year					
Ergon Energy owned and operated					
• Major	374.45	377.42	387.05	396.92	407.04
• Minor	223.09	227.61	233.41	239.36	245.47
Gifted & Ergon Energy operated					
• Major	151.21	175.53	180.01	184.60	189.31
• Minor	99.06	115.45	118.39	121.41	124.51

Ergon Energy proposes that prices for the final three years of the 2015-20 regulatory control period vary by CPI. The prices shown in the above table are based on forecast CPI of 2.55%

If Ergon Energy is requested by a customer to construct non-standard street lights, Ergon Energy may require the customer to pay an additional up-front amount towards the cost of the street light asset. Non-standard street lighting assets in this context are those where the cost of the service is not fully recovered through the daily street lighting charge over a 20-year term. The 20-year term represents a reasonable expectation of the average life of a street light asset.

The amount payable will be the incremental cost difference between a standard and non-standard street light calculated in accordance with AER requirements.

8.3 Pricing methodology – exit fee for assets scrapped as a result of LED transition

The nature of transition to the use of LED technology is such that street lighting assets with substantial remaining useful lives will be removed from service. Any regulated asset owner is concerned that assets acquired in good faith be retired on a basis equitable to its owner.

Ergon Energy proposes that an exit fee apply to assets withdrawn before the end of their normal functional life. The methodology by which the proposed fees have been calculated is as follows:

1. The projected average regulatory asset base (RAB) is identified for each year of the 2015-20 regulatory control period.
2. The average RAB is split between original acquisition and refurbishment using the same factor as in the ACS pricing methodology.
3. The average RAB is allocated to major and minor light categories again using factors as in the ACS pricing methodology.
4. An annual RAB is then identified for each category of street light – EO&O and G&EO / Major and Minor.
5. The average depreciated cost/ light is calculated using projected average PL volumes.
6. A single value for each light category is selected for the 5 years as shown below:

	selected value	actual range of values
EO&O – major	$1,240	$1,281 to $1,565
EO&O – minor	$690	$714 to $883
G&EO – major	$80	$85 to $101
G&EO – minor	$45	$47 to $56

   In each case the low value in the range is for year 1 of the regulatory control period and the high value is for year 5 of the regulatory control period.
7. An amount is added to provide for the incremental administrative costs of running the LED transition program. This amount has been set at $150.

The selected values proposed in this Revised Regulatory Proposal have been maintained at the levels proposed in Version 1 of this document. This approach is being adopted because the level of the exit fee has already been communicated to customers.

The higher values that could be justified result from the AER's preferred and mandated approach to regulatory depreciation.

All street lights that are part of the LED transition program will have the exit fee that would otherwise be payable covered by the program.

It is intended that the exit fee will only be actually charged to a customer in the event that an LGA wishes to transition very large number of street lights at an early date – outside the LED transition program.

The exit fee charges proposed are:

EO&O	
Major street light	$1,390
Minor street light	$840
G&EO	
Major street light	$230
Minor street light	$195

Note: an exit fee is proposed for G&EO lights because Ergon Energy incurs refurbishment capital expenditure in respect of these assets.

8.4 Conclusion

The changing regulatory environment for street lighting ACS charges has presented Ergon Energy with a number of substantial informational challenges. During the 2010-15 period the poor state of records has been addressed through the geospatial audit, the development of the LightMap customer portal and an extensive program of customer engagement.

During the 2015-20 regulatory control period Ergon Energy is committed to building on this base – and to embracing the future through the LED transition program.

Ergon Energy is proactively seeking to improve the quality of customer experience and achieving industry best practice in street light management and is endeavouring to doing so while delivering real cost savings to street light customers in ACS charges and energy costs. Ergon Energy's ongoing street lighting management practices will be quality assured under the ISO 9001 framework.

Appendix A. Definitions, acronyms and abbreviations

The following abbreviations and acronyms appear in this summary document.

Abbreviation or acronym	Definition
ACS	Alternative Control Services A distribution service that is a direct control service but not a standard control service (as defined in the NER).
AEMC	Australian Energy Market Commission The AEMC is the rule maker for Australian electricity and gas markets. It makes and amends the National Electricity Rules, National Gas Rules and National Energy Retail Rules. The AEMC also provides market development advice to governments.
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator The AER regulates energy markets and networks. It regulates Ergon Energy's electricity distribution system.
BLR	Bulk Lamp Replacement program – part of preventative maintenance.
C&OO	Customer owned and operated
CPI	Consumer Price Index
CSO	Community Service Obligation
DTMR	Department of Transport and Main Roads
DUOS	Distribution Use of System
EEQ	Ergon Energy Queensland (Retail)
EO&O	Ergon Energy owned and operated street lights
Ergon Energy	Ergon Energy Corporation Limited
FACOM	The Ergon Energy customer management system; a register of customers and accounts
G&EO	Gifted and Ergon Energy operated street lights
HPS	High Pressure Sodium
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
LED	Light Emitting Diode
LightMap	Customer portal based on a spatial database and its associated management processes that relate to street lighting assets and the associated standing data used by AEMO
LGA	Local Government Authorities

Abbreviation or acronym	Definition
	LGAs are customers for street lighting services. They can also own street lighting assets in their own right. They are customers of Ergon Energy Retail in respect of energy supply to both Ergon Energy owned and their own street lighting assets.
Major road	Roads on which the visual requirement of motorists are dominant (e.g. traffic routes). Typically the responsibility of a state or territory road authority.
Minor road	Roads on which the visual requirement of pedestrians are dominant (e.g. local roads and lighting that is applicable to areas other than roads outside street areas e.g. outdoor shopping). Typically these are the responsibility of the local government authority.
NEL	National Electricity (South Australia) Law (Qld) is the cooperative legislation that governs the Australian electricity sector.
NER	National Electricity Rules – the Rules, as defined in the National Electricity Law. The NER are administered by AEMC
NSP	Network Service Provider
PE cell	Photoelectric cell used for the electrical switching on and off lamp/light based on pre-set natural light levels
PTRM	Post Tax Revenue Model
QCA	Queensland Competition Authority
RAB	Regulatory Asset Base
Road Patrol	Road Patrol Lighting Outage Detection Program
SmallWorld	The Ergon Energy design register
SCS	Standard Control Service
Street Lighting Services	Street lighting services are the installation, repair, replacement and maintenance of street lighting whether owned by the Network Service Provider (NSP) or by another party. This also includes the alteration and relocation of existing street lighting assets. Street lighting assets include luminaires, brackets, lamps and dedicated street lighting poles (not poles that deliver network services)
TUOS	Transmission Use of System
UTP	Uniform Tariff Policy

Appendix B. References

1. Compliance documentation

Name	Description
Electricity Act 1994 (Qld)	State legislation governing the supply, distribution, sale and use of electricity in Queensland.
Final Framework and Approach for Energex and Ergon Energy – Regulatory Control Period commencing 1 July 2015 (Framework and approach)	This document was issued by the AER in April 2014 pursuant to chapter 6 of the NER. It classifies street lighting services as a Direct Control Service (DCS) and thereby requiring a prescriptive approach to price setting. It then sub-classifies street lighting services as an Alternative Control Service (ACS) – that is a service that is customer specific or customer requested. The AER indicates that it will "determine prices for individual ACS in a variety of ways, suitable to specific circumstances".
National Electricity (South Australia) Law (Qld)	The NEL is the legislation that governs the Australian electricity sector. It establishes the responsible institutions including the Australian Energy Market Commission (AEMC) and the Australian Energy Regulator (AER). The NEL makes AEMC responsible for making and updating the National Electricity Rules (NER).
National Electricity Rules	Statutory instrument made under the *National Electricity (South Australia) Act 1996* governing the National Electricity Market and the regulation of market participants including Ergon Energy. Chapter 6 of the NER sets out the general framework by which the AER is to regulate the distribution sector.
Queensland Government Notified Prices	Regulated retail electricity prices that are determined by the Queensland Competition Authority (QCA). These prices do not apply to customers who are on a retail market contract.
Regulatory Information Notice (RIN)	This document was issued by the AER and sets out the information Ergon Energy is required to provide to allow the AER to make a distribution determination for the regulatory control period commencing on 1 July 2015 and ending on 30 June 2020. It makes specific reference to street lighting services at paragraph 15. In general, the AER requires the same type of information in relation to operating expenditure, capital expenditure and the underlying assets as it requires in relation to other parts of Ergon Energy's regulated distribution business.
Transport Infrastructure Act 1994 (Qld)	This legislation provides for declaration of roads – they are then the responsibility of the Department of Transport and Main Roads (DTMR)

2. Industry Standards

Instrument	Content
Australian Standard AS/NZS1158 Lighting for Roads and Street Spaces	AS/NZS1158 sets standards for illumination and for reliability that Ergon Energy uses to plan its maintenance programs for street lighting assets.

3. Strategic documentation

Name	Description
Network Optimisation Street Lighting Management Plan	This management plan outlines the treatment of assets for the Asset Class of Street Lighting. This includes 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.
Standard for Preventative Maintenance Programs 2014-15	Details the inspection and maintenance programs that will be conducted during the period detailed
Standard for Street Lighting Assets (STNW1144)	Joint Ergon Energy and Energex Maintenance Standard Section 7 – In service Condition Assessment (ISCA)
Street Lighting Strategy	This strategy outlines Ergon Energy's strategy for managing street light assets for street lighting customers throughout regional Queensland during the 2015 to 2020 regulatory control period and beyond. The document focuses on functions associated with establishing and operating new street lighting assets and their impact on existing maintenance regimes.