8.11

Public lighting investment plan

Ausgrid

Content

1 INTRODUCTION 3

2 OPERATIONAL EXPENDITURE 4
2.1 Scheduled maintenance 4
2.2 Unscheduled maintenance 4
2.3 Expenditure in current regualtory control period 5
2.4 Expenditure in 2019-24 regulatory control period 5

3 OPERATIONAL EXPENDITURE COST BUILD UP MODEL INPUTS 7
3.1 General assumptions 7
3.2 Unscheduled maintenance assumptions 9
3.3 Material Price Inputs 10
3.4 Connection inputs 11
3.5 Scheduled maintenance assumptions 11

4 CAPITAL EXPENDITURE 13
4.1 Overview 13
4.2 Major road mercury replacement 13
4.3 Minor road mercury replacement 14
4.4 Twin 20 replacement 14
4.5 New public lighting 14
4.6 Reactive Public Lighting 14
4.7 Pole Replacement 14

5 CAPITAL EXPENDITURE COST BUILD UP MODEL 15
5.1 Public Lighting Annuity Charge Model 15
5.2 Pricing Model Inputs 15

1 INTRODUCTION

Ausgrid's public lighting services encompass the provision, construction and maintenance of public lighting assets within its network area. Whilst public lighting services are separately identified and regulated, they are delivered by Ausgrid's network business, which enables economies to be made in forecasting, planning and operations. This ensures both public lighting services and network services are efficiently delivered.

This attachment describes:

- Capital and operating expenditure in the current period and forecasts for 2020-24
- The maintenance regimes in place for all public lighting assets
- The various components of operational and capital expenditure
- Assumptions made in the capital and operational cost build up models
- How the proposed prices for public lighting services are built up from Ausgrid's costs.

2 OPERATIONAL EXPENDITURE

Maintenance for public lighting assets consists of two direct sources of expenditure; scheduled and unscheduled maintenance. This document describes the activities associated with this work, issues faced, expenditure during the current regulatory period and forecast expenditure and revenue requirements for the 2019-24 regulatory control period.

2.1 Scheduled maintenance

Scheduled maintenance includes a periodic bulk lamp replacement (BLR), steel lighting pole inspection, night patrols and routine tasks performed in conjunction with the BLR such as cleaning the visor and adjusting out of position brackets and luminaires.

The BLR period is reviewed regularly in order to determine the most cost efficient cycle. During the current regulatory control period, Ausgrid has increased the BLR cycle to 48 months for lamps, 60 months for LED luminaires and no longer performs a bulk PE cell change. This has been possible due to the introduction of LED street lights and more reliable lamp technologies. Ausgrid still maintains street lights that are not suitable for a 48 month BLR; however, it is forecast that these technologies will be replaced by 2019/20.

BLR cycles are determined such that service availability and lighting levels are maintained and comply with the levels specified in the Lighting for public roads and spaces Australian standard AS1158 and in doing so minimise unscheduled maintenance costs associated with repairing failed lights and maintaining illumination levels. The optimum timing of these cycles is dependent on technical and financial constraints. Technical constraints consist of the lumen depreciation and mortality characteristics of traditional lamp sources and LED light modules as well as the cleaning interval of the luminaire. Financial constraints largely focus around the difference in unit costs between scheduled maintenance (contractor BLR rates) and unscheduled maintenance (Ausgrid spot replacement costs). The optimisation of the BLR period is via the minimisation of the total cost of ownership.

Scheduled maintenance is mainly performed by external service providers. Rates are sought by competitive tender and expenditure is relatively predictable. Materials used as part of the BLR are issued free to the external service providers from Ausgrid stores and the rate of their use and procurement cost is also relatively predictable.

2.2 Unscheduled maintenance

Unscheduled maintenance comprises tasks which are performed in response to a reported fault or maintenance issue outside of the BLR. This work is delivered by a blend of internal and external labour. The most common unscheduled maintenance task is the replacement of a failed lamp or PE cell. While crew are on site, an inspection is performed to check if any additional work needs to be performed. This inspection includes:

- Lenses that are opaque or substantially discoloured, cracked, improperly secured, damaged or missing
- Damaged or missing seals
- Moisture within the luminaire
- Damaged or corroded supports, luminaires, brackets or connections
- Improperly aligned luminaire or brackets
- Any other circumstances or defects, which may affect the ongoing performance of the luminaire.

Ausgrid maintains approximately 251,000 luminaires in its network area. Of these, 177,000 are on minor or residential roads and 74,000 on major or traffic routes roads.

Expenditure is broken up into the following categories

- Bulk contract – Labour costs associated with scheduled maintenance
- Bulk materials – Materials costs associated with scheduled maintenance
- Spot labour – Labour costs associated with unscheduled maintenance
- Spot materials – Materials costs associated with unscheduled maintenance
- Elevated work platform (EWP) costs – EWP costs associated with unscheduled maintenance
- Connections – Maintenance and capital costs associated with connections
- Overheads – overheads associated with the employment of staff
- Corporate overheads – overheads associated with the running of the business.

Maintenance costs per lamp type are built up of costs associated with each of these categories.

2.3 Expenditure in current regulatory control period

Table 1 summarises Ausgrid's operational expenditure from 2014/15 through to 2017/18.

Table 1. Operational expenditure 2014/15 – 2017/18 ($m, nominal)

	2014/15	2015/16	2016/17	2017/18 (YTD - FEB)
Revenue (Maintenance Charges Only)	15.3	15.8	16.0	10.7
Actual Spend	25.0	23.7	17.7	7.6
Difference (revenue – Actual)	**-9.7**	**-7.9**	**-1.7**	**3.1**

Ausgrid exceeded the regulatory allowance for the maintenance of public lighting assets for 2014/15 through to 2016/17. However changes in our operating model appear to be reducing the loss. This can be attributed to the blended delivery of spot repairs and the introduction and roll out approximately 40,000 LED street lights.

2.4 Expenditure in 2019-24 regulatory control period

Ausgrid has moved to a 48 month BLR for traditional lamp based luminaires and 60 month for LED. Ausgrid proposes to continue this strategy throughout the forthcoming regulatory period.

Ausgrid has adopted theoretical lamp failure rates based on four years for its pricing model as actual lamp failure data for a 48 month cycle is not available.

Table 2 lists the estimated maintenance costs over the 2019-24 regulatory control period. This data takes into consideration a number of capital programs that are forecast to take place throughout the period which have the effect of reducing overall expenditure. Further detail of Ausgrid's proposed capital plans is detailed later in this attachment

Table 2. Forecast operational expenditure 2019-24 ($m, nominal)

Year	2019/20	2020/21	2021/22	2022/23	2023/24
Bulk contract	1.97	1.93	1.90	1.94	1.98
Bulk materials	0.43	0.40	0.36	0.37	0.37
Spot labour	4.87	4.23	3.73	3.82	3.95
Spot materials	0.27	0.26	0.25	0.25	0.26
EWP costs	1.79	1.54	1.33	1.34	1.37
Connections	2.86	2.93	3.00	3.08	3.16
Overheads	2.72	2.51	2.37	2.40	2.47
Corporate overheads	1.63	1.51	1.41	1.44	1.48
Total	**16.54**	**15.31**	**14.35**	**14.64**	**15.04**

3 OPERATIONAL EXPENDITURE COST BUILD UP MODEL INPUTS

Ausgrid recovers its operational expenditure by charging customers for maintenance associated with the type of lamps installed. Pricing is based on a build up of all expected scheduled and unscheduled maintenance activities and the cost of materials and labour associated with these tasks. In general the model inputs consist of:

- Scheduled and unscheduled maintenance tasks and the costs and frequencies at which these are performed
- The number of staff required for each task
- Time to complete various tasks
- Materials prices
- Direct and indirect labour rates
- Oncosts.

The model is included as Attachment 8.10 (Public Lighting Maintenance Charge Model).

3.1 General assumptions

The first table of inputs in the opex cost build up model is a table of general assumptions. Table 3 lists these assumptions and gives a general description of the assumption

Table 3. General assumptions

General Assumptions	Description of assumption	FY20 Input
CPI (%)	Forecast CPI over the coming regulatory period	2.50%
Labour real price escalation (%)	Forecast labour escalation over the coming regulatory period	0.88%
Lamp real price escalation (%)	Lamp price escalation above CPI	0.00%
Visor real price escalation (%)	Visor price escalation above CPI	0.00%
PE cell real price escalation (%)	PE price escalation above CPI	0.00%
Miscellaneous real price escalation (%)	Miscellaneous materials price escalation above CPI	0.00%
EWP real price escalation (%)	EWP price escalation above CPI	0.00%
Labour rate ($/hour)	Hourly award labour rate excluding overheads for a linesman	$56.47
Labour rate - overtime ($/hour)	Hourly overtime labour rate excluding overheads for a linesman	$106.72
EWP ($/hour)	Elevated work platform cost per hour	$33.63
Average Visor cost	Weighted average of all visor types Ausgrid currently repair	$52.11
Average PE cell cost	Weighted average of PE cell costs	$11.57
Average miscellaneous materials cost	Materials other than lamps, cells and visors (Not used)	$15.72
Proportion of work in overtime hours (%)	Proportion of public lighting tasks completed in overtime hours	7%

General Assumptions	Description of assumption	FY20 Input
Proportion of work in standard hours (%)	Proportion of public lighting tasks completed in standard hours	93%
Labour oncosts (%)	Oncosts associated with employment of a linesman	52%
Corporate Overheads (CAM)	Overheads associated with cost of operating	11%
Overhead cost allocation (Direct + Indirect) (%)	Overheads associated with cost of operating	22%

The following table provides further information on the general assumptions.

Table 4. General assumptions – further details

General Assumptions	Further information on assumption
CPI (%)	CPI figures are used to escalate all materials prices, sub contracted service rates and connection maintenance costs.
Labour real price escalation (%)	This rate is used to escalate labour rates only.
Lamp real price escalation (%)	Material, miscellaneous and EWP prices are assumed to increase by CPI only. No further escalation has been included.
Visor real price escalation (%)	
PE cell real price escalation (%)	
Miscellaneous real price escalation (%)	
EWP real price escalation (%)	
Labour rate ($/hour)	Labour rates are the CPI adjusted ancillary labour rates approved in the 2014-19 determination
Labour rate - overtime ($/hour)	The overtime rate considers the amount of work performed at 1.5x, 2.0x and 2.5x. A weighted average of 1.89x was calculated and used for this assumption.
EWP ($/hour)	All unscheduled maintenance requires the use of an EWP. Ausgrid has three sizes of EWPs. This model input is a weighted average based on the actual usage of each of these sizes. This value was determined and approved in the 2014-19 model and has been adjusted by CPI for inclusion in the 2019-24 model.
Average Visor cost	Ausgrid requires to hold stock of up to 38 different visor types. A weighted average of the usage of these visors was calculated over the period 07/16 – 06/17 to include in the pricing model.
Average PE cell cost	There are two types of PE cells in Ausgrid's network, namely D2 base and NEMA base cells. A weighted average of the usage over the same period was calculated and included in the pricing model.
Average miscellaneous materials cost	The miscellaneous materials covers the cost of fuses, connectors and cable and other materials used to repair streetlights.
Proportion of work in overtime hours (%)	The proportion of public lighting task completed in overtime to standard time was calculated using actual data from 201718. Overtime has reduced significantly from the previous regulatory determination due to the introduction of afternoon shifts and the blended delivery of spot repairs.
Proportion of work in standard hours (%)	

General Assumptions	Further information on assumption
Labour oncosts (%)	Oncosts include the following costs of employment: • Annual leave • Sick leave • Public holidays • Superannuation • Long service leave • Payroll tax. The oncost that have been applied to the public lighting maintenance model are consistent with those used for ancillary network services.
Corporate Overheads (CAM)	The overhead rate represents the indirect costs which enable the linesman to carry out the work in the organisation. Overhead allocations include the following: • Other Labour: amounts for the employee's unproductive time used for training, wet weather, breakdown, stand-down and allowances for any back pay or supervision entitlements. • Fleet: Includes the cost of vehicles and running expenses. • Non labour: protective clothing, minor materials, contract services, communications, tolls, taxes, IT, training costs of a non labour nature. • Indirect Labour: Management costs for that organisational group and higher and including the cost of some support areas. • Indirect Non Labour: Management related costs and other costs of a non labour nature. The overhead rate has been calculated using historical values. Public lighting opex overheads are calculated as a percentage of all cost associated with public lighting opex.
Overhead cost allocation (Direct + Indirect) (%)	Corporate overhead expenses fall under the following categories: • Finance & Compliance & Internal Communications • Human Resources & Health, Safety & Environment • Information, Communication & Technology • Insurance • Property. The corporate overhead rate is calculated by the ratio of the total cost allocated to public lighting by the total opex spend.

3.2 Unscheduled maintenance assumptions

Unscheduled maintenance (spot maintenance) of lamps and other components still occur regardless of whether there is a bulk maintenance regime is in place or not. Whilst an effective bulk replacement regime will reduce the number of failures which occur between replacement cycles, spot maintenance is still required to fix failures that occur between bulk replacement periods.

The model calculates the cost of labour, vehicles/equipment and materials that will be required to maintain all components as they fail. The rates that individual lamp types required some form of unscheduled maintenance has been determined using a combination of manufacturer's lamp failure rates and Ausgrid's actual failure data. As Ausgrid has only recently moved to a four year BLR, there is no actual lamp failure rates available for the fourth year. As most lamp types begin to fail at increasing rates over time, the fourth year can often significantly increase the number of lamp failures.

Table 5 lists the assumptions used in the calculations of the Spot Materials and Spot Labour cost components.

Table 5. Unscheduled maintenance assumptions

Opex model inputs description	Inputs
Number of workers in standard crew	2.00
Additional workers on traffic route	1.00
Time required for average spot lamp replacement (hours)	0.76
Time for PE Cell replacement (hours)	0.76
Time for other spot maintenance task (hours)	0.76
Annual average failure rate for PE cells	1.98%
Annual average failure rates for other components	3.26%

Ausgrid uses two staff for all residential roads (category p roads) and three staff when work is required to be performed on a traffic route (category V roads).

The 'Time required for an average spot lamp replacement' is 45.6 minutes (0.76 x 60mins). A clear distinction needs to be made between the time to complete an unscheduled maintenance task and a scheduled maintenance task. Unlike bulk lamp replacements, these repairs are not located on adjoining poles and are not all the same in nature. Consequently, each repair will involve:

- Travel to the site
- Set-up of work site and tools, etc
- Identify fault
- Make repair
- Test repair
- Clear work site and pack away tools.

The relationship between the annual revenue requirements and the unscheduled maintenance assumptions are as follows:

> *Annual spot labour revenue requirement = Labour rate x hours required for repair x number of staff x annualised failure rate*

3.3 Material Price Inputs

Material prices for the majority of equipment used on public lighting are sourced by competitive tender. Where equipment is no longer purchased or used but is still required for price modeling, the last known price is used or the 2010 AER determination figure is carried over.

The relationship between the material price inputs and revenue requirements is as follows:

> *Annual spot material revenue requirement = Material price x annualised failure rate per lamp type x population of particular component*

Material prices increase by CPI only over the 2019-24 regulatory control period. No other escalation is used.

3.4 Connection inputs

The connection charges are the recovery of costs associated with underground connections only. Ausgrid does not include any charges for overhead connected street lights. This charge is to cover the costs associated with the repair and reinstatement of underground street lighting faults as well as the periodic inspection for electrical integrity.

When an underground connection of a public light fails, due to water ingress, corrosion or other reasons, Ausgrid must dig up the connection to repair it. This is a time consuming and labour intensive as faults are notoriously difficult to find and complicated to repair. Repair invariably requires other skilled staff like testing technicians, cable jointers and substation technicians. It is common for these types of tasks to require traffic control given the long period of time required to undertake the repair. While only a small number of underground connections fail per year, the cost of repair is relatively high.

Ausgrid has maintained the same rates in real terms from our 2008 proposal and the 2008 proposal was based on the 2005 proposal to IPART.

The calculation for the revenue requirements of connection repairs are as follows:

> *Annual Connection revenue requirement = Flat rate (as per connection type) x number of connections*

3.5 Scheduled maintenance assumptions

Table 6 lists the tasks, cycle times and rates associated with the BLR program. These rates and cycle times form the inputs used to calculate the costs associated with Bulk Contract and Bulk Materials expenditure.

BLR rates for 2019/20 are derived from 2016/17 tendered sub-contractor rates escalated by CPI.

The BLR is driven around the need to periodically replace lamps and PE cells to maintain compliance with the relevant Australian Standards whilst minimising the costs associated with this. Tasks that cover the relamping of all luminaires is the 'Servicing of Minor Luminaire – Scheduled' and 'Servicing of Major Luminaire – Scheduled'. The other tasks listed below are performed as required and the cycle times are calculated from the historical frequencies that the various tasks are performed.

Ausgrid has moved from a 2.5 year to a 4 year BLR and no longer periodically replaces PE cells due to higher reliability leading to fewer failures. These changes in strategy reduce the overall maintenance charges to public lighting customers. LED luminaires have been modelled to be periodically cleaned every 6 years.

Table 6. BLR task cycle times and rates

Description of task	Cycle Time	FY 20 Rate ($)
Servicing of Minor Luminaire - Scheduled	4.00	$25.86
Servicing of Major Luminaire - Scheduled	4.00	$30.12
Servicing of Minor LED Luminaire - Scheduled	6.00	$25.86
Servicing of Major LED Luminaire - Scheduled	6.00	$30.12
Replacement of Luminaire Visor	140.39	$12.04
Replacement of Photo-electric Cell	-	$5.84
Minor Non-Electrical Repair	168.60	$25.30
Apply Temporary Insulation	49.93	$15.16
Minor Electrical Work	66.50	$42.13

Description of task	Cycle Time	FY 20 Rate ($)
Night Time Traffic Route Luminaire (TRL) Patrol	16,275.60	$8,688.27

The relationship between cycle times, unit rates and revenue requirements are detailed below:

Annual revenue requirement = unit rate x lamp count x 1/cycle Time

For example:

'Servicing of Major Luminaire – Scheduled' (i.e. bulk relamping on major roads)

Annual revenue requirement = 30.12 x 79,000 x 1/4 = $594,870

That is, the annual revenue requirement for the labour component of the 'Servicing of Major Luminaire – Scheduled' is $594,870.

The less intuitive cycle times is the 'Night Time Traffic Route Luminaire (TRL) Patrol'. The night patrols are performed by external service providers in the South and East regions and by Ausgrid field staff in all other regions. They are a means of detecting faults on major traffic routes that are unlikely to be reported by the general public. Having an alternative means of fault detection on these routes is a requirement of AS1158. Rates for the South and East are competitively tendered contract rates and are given as a lump sum per patrol. The model calculates a price per lamp based on these contract rates and applies it across all lamp types. The cycle time is such that the annual cost of these patrols is spread across the entire population of street lights.

Cycle times that have no value in Table 6 are not used in any calculations as they are no longer tasks that are performed by the BLR contractors.

4 CAPITAL EXPENDITURE

This section provides justification and explanation of Ausgrid's specific capital expenditure programs as well as summarising the key financial information of the programs as well as detailing the capital pricing model used to determine customer charges for capital recovery.

4.1 Overview

As with all public lighting capital programs, if assets are replaced before the end of their economic life customers are expected to pay the residual value. A new charge reflective of the installed asset is then levied. Residual values of assets installed pre July 2009 are calculated in attachment 8.08 (Public Lighting Pre 2009 Fixed Charge) model and the residual value of assets installed post July 2009 is the present value of the future annuity payments up to the asset life.

Ausgrid has categorised its public lighting capital expenditure into the following programs:

- Major road mercury replacement
- Minor road mercury replacement
- Twin 20 replacement
- New public lighting
- Reactive public lighting
- Pole replacement.

The proposed expenditure is tabled below.

Table 7. Forecast Public Lighting Capital Expenditure (Real FY19 $000s)

	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Major Road Mercury Replacement	8,596	8,596	8,596				
Minor Road Mercury Replacement	10,863	10,863	10,793				
Twin 20 Replacement	5,963						
New public lighting	1,338	1,371	1,405	1,443	1,482	1,519	1,557
Reactive public lighting	911	1,291	1,979	1,776	1,773	1,773	1,774
Pole Replacement public ligh	5,417	5,417	5,417	5,417	5,417	5,417	5,417
Total Public Lighting	**33,087**	**27,538**	**28,191**	**8,637**	**8,672**	**8,709**	**8,748**

4.2 Major road mercury replacement

Ausgrid has approximately 20,000 major road street lights that use Mercury Vapour lamp technology. This technology is highly inefficient and requires significantly more planned and unplanned maintenance when compared to the equivalent LED replacement.

In Ausgrid's 2015-19 regulatory submission these luminaires had been earmarked to be replaced with High Pressure Sodium "Active Reactor" equivalents. However in consultation with our customers the decision was made to wait until LED became a more commercially and technically viable option. We are now at that point and are planning to proactively replace all major road mercury luminaires.

The servicing of these luminaires will be significantly impacted by the Minimata Convention on Mercury and the potential this convention has to limit the supply of mercury lamps, therefore this program has a required end date in 2020.

4.3 Minor road mercury replacement

Ausgrid has approximately 80,000 minor road street lights that use Mercury Vapour lamp technology. This technology is highly inefficient when compared to the equivalent LED replacement. Local councils have expressed an interest in replacing the existing mercury luminaires with LED as there are significant energy and operational savings. This program focuses on minor road mercury luminaires which are 125W and below.

As per the major road mercury replacement, the supply of lamps will diminish in 2020 so there is a requirement to replace these luminaires beforehand to reduce the risk of additional charges being levied for lamps due to a reduction in supply.

4.4 Twin 20 replacement

Ausgrid has approximately 10,000 twin 20 fluorescent and similar variant luminaires installed on its network. Not only do these luminaires consume double the amount of the equivalent LED, the light output is significantly lower. Ausgrid has been reactively replacing these luminaires over time; however plan to begin a proactive replacement in 2018.

4.5 New public lighting

A relatively small expenditure has been forecast for new public lighting assets. This category is where a street light is installed where there was no light previously. Typically the construction of new public lighting is contestable, however Ausgrid's Minor Capital policy allows for customers to request for additional lights on existing poles. Expenditure of this nature would be captured under this program.

4.6 Reactive Public Lighting

Ausgrid is continually replacing street lights that fail due to age and any number of other reasons. The Reactive Public Lighting program covers luminaires and other street lighting components that are replaced which have not been targeted in a specific proactive replacement program such as the minor and major road mercury replacement programs. In the previous five years, the majority of street lighting capital work has been captured in this program as Ausgrid has not performed any proactive replacement programs, however the forecast expenditure through the 2019-24 period is relatively low due to the number of proactive replacement forecast.

4.7 Pole Replacement

This program is the proactive replacement of steel street lighting columns that have been condemned. Condemned poles are identified by pole inspectors using a detailed/planned inspection/condition assessment process. Poles which have been identified to be replaced are added to the program worklist by the responsible officer within Network Operations. The poles will then be replaced either by Ausgrid staff or contractors.

5 CAPITAL EXPENDITURE COST BUILD UP MODEL

5.1 Public Lighting Annuity Charge Model

Ausgrid proposes to retain the form of modelling used for the 2015 determination and has updated the 2015 models to reflect changes that have taken place in the intervening period. Assets installed post July 2009 are priced using a cost build up model which then calculates an annuity based on the expected life of the asset. This model is attached at 8.09 (Public Lighting Post June 2009 Annuity Charge Model).

The functionality of the model remains as it was proposed in the 2010 determination however changes have been made so that LED pricing better reflects the technology. The changes are:

1. The annuity period for LED pricing is 10 years rather than the 20 years that has been traditionally used. At the end of 10 years the annuity charges will cease. Customers were presented a number of choices regarding this period and 10 years was chosen by the majority. The advantages for the shorter period are that customers will effectively pay off the asset quicker reducing the risk of having large residual values remaining towards the end of the technical life of the asset. It also reduces the need for speculation of failure rates from years 10 to 20.
2. A warranty premium of 5% of the annuity has been added to LED charges. This warranty covers the cost of LED luminaires failing before the end of their economic life. Councils were given the option to not pay the 5% premium, however would be required to pay residual value of failed luminaries less any warranty value from the supplier, however councils opted for the additional 5%

The total cost of installation of a component is given by the formula:

Total cost = Materials cost + Labour + EWP cost + overheads on capital

Customer annuity repayments are calculated by:

$$P = \frac{r(PV)}{1-(1+r)^{-n}}$$

Where:

P = Payment

PV = Present Value (Total cost)

r = rate per period

n = number of periods

5.2 Pricing Model Inputs

Inputs into the model consist of the following:

- WACC (Pre tax real)
- Standard asset lives
- Labour rates
- Hours to install new components and the proportion of work performed in overtime rates

- Pole establishment costs
- Elevated work platform rates
- Material prices
- Allocations of labour to brackets and luminaires
- Overheads
- Inflation
- LED warranty premium.

5.2.1 WACC (Pre tax real)

WACC inputs for public lighting models are derived from standard control service PTRM models.

5.2.2 Standard asset lives

Table 8 below details the component lives in the annuity model. These are the expected lives of the asset and are the number of years used in the annuity model calculations.

Table 8. Economic Lives of Public Lighting Assets

Component	Asset life (years)
Luminaire (traditional)	20
LED Luminaire	10
Bracket	35
Support	35
Connection	20

5.2.3 Labour rates

Labour rates used in the model have been replicated from Ausgrid ANS charge model.

5.2.4 Hours to install new components and the proportion of work performed in overtime rates

The man hours to install a new light are 2.01 hours for a residential road and 3.02 on a traffic route. The difference is due to the requirement of additional linesman on traffic routes. These time frames have been carried over from the 2015-19 determination.

The proportion of public lighting tasks completed in overtime compared to standard time was calculated using actual data from 2016/17. This figure has reduced from the previous regulatory period due to the introduction of afternoon shifts.

5.2.5 Pole establishment costs

In the annuity pricing model labour is recovered by allocations of labour to the bracket and luminaire. As such when a new support is installed a specific capital expenditure amount needs to be included in the total cost to recover the costs associated with its installation. The specific capital expenditure amounts inputs are averages for the replacement of both in ground mounted and rag bolt assembly steel columns. This figure has been obtained by contractor tendered rates.

5.2.6 Elevated work platform rates

All public lighting tasks require the use of an EWP. Ausgrid has three sizes of EWP's. A weighted average based on the actual usage of the various size EWPs has been calculated and included in this model.

5.2.7 Material prices

Material prices for the majority of equipment used for public lighting are sourced by competitive tender. Where equipment is no longer purchased or used but is still required for price modeling, the last known price is used or the 2015 AER determination figure is carried over.

5.2.8 Allocations of labour to brackets and luminaires

The allocation of labour to the bracket and luminaire has been carried over from the 2015-19 determination.

5.2.9 Overheads

Overheads on capital are tabled below. The overhead rate included in the model has been back solved exactly recover these amounts.

Table 9. Public Lighting Capital Expenditure Overheads ($000s, real FY19)

	2019/20	2020/21	2021/22	2022/23	2023/24
Total	$1,032	$578	$1,062	$1,035	$381

5.2.10 Inflation

CPI figures have been forecast to be 2.5% each year of the period. Annuity component pricing from 2019/20 onwards are inflated by CPI only and are aligned each year with actual CPI figures.

Wage escalation is 0%. Any increase over CPI will be offset by efficiency gains.

5.2.11 LED Warranty Premium

In negotiations regarding LED prices, Councils opted to pay an additional 5% of the annuity charge for warranty to be covered by Ausgrid. This means that if an LED fails during the 10 year period, Ausgrid covers the cost of replacement. This was the topic of extensive consultation with our customers and was mutually agreed.