Jemena Electricity Networks (Vic) Ltd

2016-20 Electricity Distribution Price Review Regulatory Proposal

Attachment 11-3

Public lighting charges explanatory statement

Public

30 April 2015

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GLOSSARY

dedicated public lighting assets	public lighting assets that are attached to dedicated public lighting poles
shared public lighting assets	public lighting assets that are attached to electricity distribution poles

ABBREVIATIONS

ACS	Alternative Control Services
AER	Australian Energy Regulator
CPI	Consumer Price Index
EBA	Enterprise Bargaining Agreement
EPV	Elevating Platform Vehicle
GIS	Geographical Information System
JEN	Jemena Electricity Networks (VIC) Ltd
OMR	operation, maintenance, repair and replacement
PE	photoelectric
RAB	Regulatory Asset Base
SCS	Standard Control Services
WACC	Weighted Average Cost of Capital

OVERVIEW

1. Jemena Electricity Networks (VIC) Ltd (**JEN**) provides public lighting services to 14 public lighting customers, namely 13 municipal councils and the VicRoads Authority. We expect the number of public lighting customers to remain the same over the 2016 regulatory period.

2. Our proposed classification aligns with the Australian Energy Regulator's (**AER**) preferences as outlined in their Framework and Approach paper for the 2016 regulatory period[1] (see Attachment 5-1).

Table OV–1: Comparison of service classification, 2011 to 2016 regulatory period

Public lighting services	2011-15	2016-20
OMR services of shared public lighting assets	Alternative control services	Alternative control services
Operation and maintenance services of dedicated public lighting assets	Alternative control services	Negotiated services
Replacement of dedicated public lighting assets	Alternative control services	Negotiated services
New public lighting at greenfield sites	Negotiated services	Negotiated services
New lighting technologies not subject to a regulated charge	Negotiated services	Negotiated services
Alteration and relocation of JEN's public lighting assets	Negotiated services	Negotiated services

3. In the 2011 regulatory period, operation, maintenance, repair and replacement (**OMR**) of all public lighting assets were classified as alternative control services (**ACS**). We propose that this classification be changed over the 2016 regulatory period to:

   - OMR services for public lighting assets that are attached to distribution poles (referred to as **shared public lighting assets**) be classified as ACS. Accordingly, the AER is responsible for approving set charges for the OMR services for shared public lighting assets.
   - Operation and maintenance services for the lights attached to dedicated public lighting poles (referred to as **dedicated public lighting assets**) be classified as negotiated services. Accordingly, these operation and maintenance services are subject to negotiations with the public lighting customers (namely municipal councils and the VicRoads Authority) in accordance with our negotiating framework (see Attachment 11-1).
   - Replacement services for the lights attached to dedicated public lighting poles be classified as negotiated services and also subject to negotiations with the public lighting customers in accordance with our negotiating framework.

4. JEN's proposed charges for OMR services of shared public lighting assets over the 2016 regulatory period are set out in Table 3–1. These were derived by rolling forward the public lighting model for the 2011 regulatory period, and updating model inputs and assumptions to reflect changes in working conditions, cost of material and labour rates.

5. We have also made adjustments to the public lighting regulatory asset base to reflect the changes to the public lighting services classification (see Attachment 11-2B).The charges are inclusive of material and labour real price escalators and forecast Consumer Price Index (**CPI**). Actual CPI will be substituted to the charges for each year when they are known. JEN's public lighting charges model is provided in Attachment 11-2A.

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1 AER, *Final Framework and approach for the Victorian Electricity Distributors, Regulatory control period commencing 1 January 2016,* 24 October 2014.

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1. CHARGING METHODOLOGY

6. JEN's OMR public lighting charges for shared public lighting assets for the 2016 regulatory period are derived from a limited building block model, that takes into account forecast opex and capex for public lighting services. This is consistent with the approach taken by the AER to develop OMR public lighting charges for the 2011 regulatory period.

7. In addition to adopting the model from the 2011 regulatory period for calculating OMR prices, a structural change was made to incorporate real escalator for labour rate changes over the course of the 2016 regulatory period that would otherwise cause JEN to under recover its reasonable and efficient costs.

8. With this approach to determining price we have rolled forward the AER's final decision public lighting model for the 2011 regulatory period and adjusted a number of inputs. The key adjustments to the inputs of the public lighting charges model relative to those approved in the 2011 regulatory period are:

- Escalation factors for labour, materials consistent with those proposed for Standard Control Services (**SCS**).
- The real pre-tax weighted average cost of capital (**WACC**) has been updated. Consistent with the approach taken in the 2011 regulatory period, the real pre-tax WACC rate is the same as for SCS.
- Forecast CPI have been applied. This will be adjusted when the actual is known.
- The opening public lighting regulatory asset base (**RAB**) has been set to include only shared public lighting assets (see attachment 11-2B).
- The forecast volume has been adjusted to include only shared public lighting assets (see section 2.2).
- Proportions of minor road lights that fail between bulk changes have been adjusted to reflect JEN's reported historical failure rates (see section 2.3).
- The number of repairs and bulk replacement of lamps that can be performed in a day have been reduced to reflect longer travel times due to congested road conditions, and greater focus on traffic management at worksites (see section 2.4).
- Traffic management costs have increased (see section 2.5)
- Traffic management costs have been included for replacement of shared lighting assets.
- Indirect overheads have been applied to asset replacement activities (see section 2.6).
- Inclusion of costs for stakeholder management, necessary to respond to public lighting matters for individual municipal councils and VicRoads.
- A new energy efficient LED 18W light has been added to the model.

2. ADJUSTMENT TO MODEL INPUTS

9. This section discusses each of the adjustments have made to the inputs of the AER's final decision public lighting model for the 2011 regulatory period. Our public lighting charges build-up model for the 2016 regulatory period is in Attachment 11-2A.

2.1 ADJUSTMENT TO THE OPENING PUBLIC LIGHTING REGULATORY ASSET BASE

10. In the 2011 regulatory period, OMR services for all public lighting assets were classified as ACS. However, for the 2016 regulatory period, only the OMR services of shared public lighting assets will be classified as ACS.

11. Public lighting asset[2] consist of four key components:

- Luminaires – that is, the light fitting attached directly to the pole or a bracket
- Dedicated lighting poles
- Lighting brackets

12. To account for the change in classification of services, we have adjusted the opening public lighting RAB for the 2016 regulatory period to include only shared public lighting assets.

13. **Step 1** – We identified the number of shared and dedicated lights at the end of 2014 (refer to Table 2–1). We then apportioned the closing 2014 RAB of the luminaires based on the proportion of shared and dedicated luminaires.

Table 2–1: Split of shared and dedicated public lights

Category	Number of shared lights		Number of dedicated lights		Total
	Number	%	Number	%	Number
Existing lights	38,387	54.3%	19,364	27.4%	57,551
Energy efficient minor road lights	8,420	11.9%	4,554	6.4%	12,974
Total	46,807	66.2%	23,918	33.8%	70,725

Source: GIS public lighting assets as at 31 Dec 2014.

[2] The dedicated lighting poles and brackets are inclusive of lighting cables up to the network connection point.

14. **Step 2** – As shared public lighting assets do not have dedicated public lighting poles only a portion of the lighting brackets in the closing 2014 RAB should be included in the public lighting opening RAB for the 2016 regulatory period. In order to develop a method of apportionment, we used the GIS data to identify the number of major and minor road poles and brackets. We then calculated the replacement cost (materials only) of poles and brackets (refer to Table 2–2). To keep the method of apportionment simple, we have assumed all other related repayment costs are commensurate to the material costs.

Table 2–2: Replacement value of poles and brackets

Pole and brackets in minor and major roads	Replacement value ($2015, $millions)	%
Dedicated public lighting poles in minor roads	4.27	24.4%
Dedicated public lighting poles and brackets in major roads	10.14	57.8%
Sub-total of dedicated pole and brackets	14.41	82.2%
Shared lighting brackets in minor roads	0.98	5.6%
Shared lighting brackets in major roads	2.15	12.3%
Sub-total of shared brackets	3.13	17.8%
Total	17.54	100.0%

15. As shown in Table 2–2 the value of dedicated lighting poles is considerably greater than the value of brackets. Moreover, the value of major road lighting dedicated poles and brackets are higher than minor road dedicated poles, which generally do not have a bracket.

16. Shared lighting brackets account for a small portion (17.8%) of the replacement cost of poles and brackets. We apportioned 17.9% of the closing 2014 RAB for poles and brackets to ACS. The calculations of the RAB apportionment are included in Attachment 11-2B.

2.2 VOLUME CHANGE

17. JEN has complete records of dedicated and shared lights assets in its GIS. We used this data as a base to forecast the volume of shared lights shown in Table 2–3.

18. In response to customer requests, we amended our asset replacement policy for minor road luminaries that reach the end of their economic life. Our policy now is to replace old technology minor road luminaires that have failed with energy efficient LED 18W luminaries[3]. Previously, our replacement policy was like-for-like replacement.

19. Over the 2011 regulatory period, a number of municipal councils requested JEN to bulk replace out dated minor road luminaires in their municipality with energy efficient T5 luminaires. JEN's volume forecast includes those luminaires that were bulk replaced and those that are scheduled for replacement by 2015.

20. The number of light types for which JEN has proposed OMR charges over the 2016 regulatory period is substantially less than the current list of approved charges because a number of light types have become obsolete, and have been either removed or replaced by an equivalent standard light.

[3] Volume of LED 18W lights in Table 2-3 reflects this policy.

Table 2–3: Forecast volume (number) of shared lights by type of light

Description of lights	2016	2017	2018	2019	2020
Minor road lights					
Mercury Vapour 80 watt	8,927	8,798	8,672	8,547	8,424
Mercury Vapour 125 watt	236	232	229	226	223
Sodium High Pressure 100 watt	764	753	742	731	721
Metal Halide 70 watt	8	8	8	8	8
Energy efficient lights					
T5 (2X14W)	22,654	22,963	23,272	23,581	23,890
T5 (2x24W)	215	215	215	215	215
Compact Fluoro 32W	5	5	5	5	5
Compact Fluoro 42W	44	44	44	44	44
LED 18W	295	433	570	705	838
Major road lights					
Sodium High Pressure 150 watt	10,446	10,588	10,728	10,866	11,003
Sodium High Pressure 250 watt	3,154	3,160	3,166	3,172	3,177
Sodium High Pressure 400 watt	192	192	192	192	192
Mercury Vapour 250 watt	79	67	57	49	42
Mercury Vapour 400 watt	122	116	110	105	128
Metal Halide 150 watt	22	22	22	22	22
Metal Halide 250 watt	48	48	48	48	48
Total	**47,217**	**47,650**	**48,086**	**48,521**	**48,957**

21. The volumes of lights are presented in the public lighting model in Attachment 11-2A.

2.3 FAILURE RATE OF MINOR ROAD LIGHTS

22. JEN records all instances where minor road lights are reported as failed. We analysed the data[4] to determine the annual failure rate of minor road lights for four years, from 2011 to 2014. The failure rate ranged from a high of 9.4% in 2011 and to a low of 6.4% in 2014. We applied the lower annual failure rate of 6.4% in the public lighting charges model in Attachment 11-2A.

4 Source: Public lighting 'lights out' notifications in SAP, 2011-14.

2.4 REPAIR AND BULK LAMP AND PE CELL REPLACEMENT RATE

2.4.1 PUBLIC LIGHTS REPAIRS PERFORMED IN A DAY

Minor road light repairs

23. The AER's final public lighting model for the 2011 regulatory period assumes a two person crew in an elevating platform vehicle (**EPV**) will perform 30 minor road repairs in an urban area (25 in rural area) in an 8-hour day, which equates to 16 minutes per light repair. We have assessed that this is not sustainable given the current traffic congestions on roads, traffic management and safety requirements.

24. We have determined that the crew would require 45 minutes to repair a faulty light on a minor urban road. This includes:

- 20 minutes travel time between worksites—including the depot, given the current traffic congestion on the roads
- 10 minutes for site assessment—activating and deactivating the stabilisers of the EPV and setting up and removing traffic management 'cones' around the worksite
- 15 minutes to repair the light—examine the light using an EPV, ascertain the cause of the street light fault, which can be a lamp, photoelectric (**PE**) cell, loose connection or a blown fuse due to faulty control gear inside the luminaire–and test to confirm the light is working.

25. An allowance of 45 minutes is conservative for repair of a light on a minor road. In that time the crew perform their own traffic management at the work site utilising traffic management devices such as cones and stop/go bats. We have not sought any allowance for traffic management for light repairs and asset replacement activities on minor road assets.

26. After taking into account crew work breaks in accordance with safety and Enterprise Bargaining Agreement (**EBA**) requirements, plus time spent at the depot getting material for the day's work from the store and disposing the faulty lighting components in environmental containers, there are actually only 7.5 hours in a day for repairing faulty lights. Within this period of time a two person crew in an EPV can safely perform on average 10 minor road light repairs in an urban area per day.

Major road light repairs

27. The AER's final public lighting model for the 2011 regulatory period assumes a two person crew in an EPV will be able to perform 20 major road repairs in an urban area (16 in rural area) in a day, this equates to 24 minutes per light repair.

28. The time required to repair a light on a major road would be similar to a repair on a minor road, except the that an additional 10 minutes is required to perform a site assessment and set up traffic management, which involves diversion of traffic onto other traffic lanes as an entire traffic lane would be blocked for the duration of the repair.

29. A two person crew in an EPV can safely perform on average 8 major road light repairs in an urban area (7 in a rural area) in an 8-hour day. Accordingly, we have revised the number of repairs from 20 to 8 per day (and 16 to 7 in a rural area) to reflect the number of repairs that can be safely performed by maintenance crew under present day traffic conditions and safe work practices in major roads.

2.4.2 BULK LAMP AND PE CELL REPALCMENTS PERFORMED IN A DAY

30. The AER's final public lighting model for the 2011 regulatory period assumes a two person crew in an EPV are able to bulk replace lamps and PE cells of 90 minor road lights per day in an urban area and 75 in rural area. This equates to 5.3 minutes per light lamp replacement, with no allowance for rest breaks. It is not feasible to safely replace this number of lamps in an 8-hour day.

31. The time allowed is insufficient to perform the following tasks that are involved in bulk replacement activity:

- carry out a site inspection and set up and remove traffic management 'cones' around the worksite
- extend the stabilisers of the EPV
- reach the light in an EPV and replace the lamp and PE cell
- clean, inspect for damage, and repair luminaires if necessary[5]
- descend, retract the stabilisers, and remove the traffic management 'cones'.

32. As noted above, we have assumed there are 7.5 hours in a day to undertake productive work. In that period a crew can reasonably replace about 65 MV 80 lamps or 55 T5 lamps[6]. Any requirement for crews to increase the rate of replacement is likely to result in unsafe work practices.

33. We have proposed fewer light replacements in rural areas because of the additional travel time between lights and time taken to travel between the work depot and the rural worksite. Accordingly, we have revised the numbers for bulk replacement in our public lighting charges build-up model.

34. JEN has adjusted the inputs in the model as shown below:

- Number of bulk MV80 lamp changes in 1 day (urban) – from 90 to 65
- Number of bulk MV80 lamp changes in 1 day (rural) – from 75 to 55
- Number of bulk T5 lamp changes in 1 day (urban) – from 77 to 50
- Number of bulk T5 lamp changes in 1 day (rural) – from 64 to 42.

2.5 TRAFFIC MANAGEMENT COSTS

35. JEN's work standards require contractors to use traffic control companies that specialise in traffic management to provide a safe work environment for the employees and contractors working on main roads. This practice was adopted by JEN to meet the Code of Practice[7] on work safety and traffic management that was made under Road Management Act 2004. The purpose of the Code is set out below.

> *(1) The purpose of this Code of Practice is to provide practical guidance to any person conducting, or proposing to conduct, any works on a road in Victoria.*
>
> *(2) This Code is intended to –*

5 Public Lighting Code, clause 2.3.1(d).

6 A T5 luminaire has two lamps compared to one lamp in an MV luminaire.

7 Code of Practice, Worksite Safety–Traffic Management, gazetted in August 2010 under the Road Management Act 2004 http://www.gazette.vic.gov.au/gazette/Gazettes2010/GG2010S351.pdf

(a) establish and maintain a standardised approach to the conduct of works on roads (whether on the roadway or roadside) that protects the safety of road users and persons engaged in the carrying out of such works;

(b) establish a hazard based assessment of worksite conditions to enable the identification and implementation of appropriate control measures to ensure a safe worksite;

(c) support the planning for, and management of, traffic to pass safely through, past or around a worksite, including the preparation and implementation of a traffic management plan; and

(d) support the engagement of appropriately trained and qualified persons to carry out the works or direct traffic.

36. It is noteworthy that industry work practices on major roads changed significantly after the Code was gazetted in August 2010, however the impacts on the time taken to undertake tasks on major roads were not factored into the AER's final decision public lighting model that supports the current OMR charges.

37. The AER's final decision public lighting model for the 2011 regulatory period includes traffic management allowance, which was wholly assigned to public lighting operation and maintenance expenditure. There was no traffic management allowance for replacement of public lighting assets.

38. Traffic management requirements for major roads are more onerous than for minor roads. Unlike minor roads, where the fault repair crew perform traffic management–-utilising traffic management devices such as cones and stop/go bats–-our contractors working on main roads engage traffic control companies to provide traffic management. Traffic management on major roads normally includes the operation of a flashing arrow mounted at the back of a vehicle. Staff from these traffic control companies accompany public lighting faults crews on major road light repairs and provide the necessary traffic management service.

39. For the 2016 regulatory period, we have included an allowance of approximately $1,200 per day for traffic management costs for repair and replacement of major road public lighting assets.[8]

2.6 APPLICATION OF THE INDIRECT OVERHEADS

40. The AER's final public lighting model for the 2011 regulatory period includes an allocation of indirect overheads to operation and maintenance activities but not to asset replacement activities. JEN has included the same rate of indirect overheads in the cost build up for public lighting asset replacement activities as for operation and maintenance activities.

2.7 ENERGY EFFICIENT LIGHT – LED 18W

41. JEN has approved energy efficient LED 18W lights for use as a standard light for minor road lighting. The light requires less maintenance because it has no lamp within the luminaire (light fitting) and only requires bulk PE cell replacement at least once every eight years in accordance with the minimum service levels in the Public Lighting Code[9].

[8] This daily allowance for traffic management is based on the actual billed costs for these services (obtained from invoices from our contractors).

[9] Public Lighting Code, clause 2.3.1(e).

42. As the LED 18W light was only recently approved for use in 2014, there are not many of these lights currently installed on our distribution area. Consequently we do not have any reliable performance data on this light to base the failure rate. The manufacturer has advised a failure rate of 10% for the LED luminaire over its 20 year life – that is 0.5% per annum. It is likely that some of the LED 18W lights will experience other faults such as faulty PE cells, loose wiring and vandalism. Therefore, we have allowed for a small number of LED 18W lights requiring attendance by a service crew.

43. We forecast that 10% of LED 18W lights will require repairs in between the eight-year bulk PE replacement cycle – that is, 1.25% per annum.

44. JEN's public lighting maintenance plans allow for monitoring of any damage or performance issues of the luminaire over the 2016 regulatory period.

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3. INDICATIVE PUBLIC LIGHTING OMR CHARGES 2016-20

45. JEN's indicative charges for public lighting OMR services for the 2016 regulatory period are set out in Table 3–1.

Table 3–1: Proposed indicative public lighting OMR charges 2016-20 ($2015)

Light Type	OMR charge $ per year				
	2016	2017	2018	2019	2020
Mercury Vapour 80 watt	57.02	57.65	58.06	57.47	57.33
Mercury Vapour 125 watt	83.82	84.75	85.35	84.47	84.27
Mercury Vapour 250 watt	182.20	185.13	187.55	187.72	189.18
Mercury Vapour 400 watt	204.98	208.28	210.99	211.19	212.83
Sodium High Pressure 50 watt	235.13	238.92	242.05	242.27	244.16
Sodium High Pressure 100 watt	257.70	261.86	265.29	265.53	267.60
Sodium High Pressure 150 watt	188.11	191.14	193.64	193.82	195.33
Sodium High Pressure 250 watt	189.80	192.85	195.37	195.54	197.06
Sodium High Pressure 400 watt	252.43	256.49	259.84	260.07	262.09
Metal Halide 70 watt	146.55	148.16	149.23	147.69	147.33
Metal Halide 150 watt	417.59	424.33	429.88	430.27	433.63
Metal Halide 250 watt	408.06	414.62	420.04	420.42	423.68
T5 (2 x 14 W)	53.97	55.35	56.44	56.32	56.73
T5 (2 x 24 W)	60.78	62.33	63.56	63.43	63.89
Compact Fluoro 32W	46.55	47.74	48.68	48.58	48.93
Compact Fluoro 42W	52.50	53.84	54.90	54.78	55.18
LED 18W	20.99	21.52	21.95	21.90	22.06

(1) The charges are inclusive of labour and material escalators and forecast CPI.

4. CURRENT PUBLIC LIGHTING OMR CHARGES 2011-15

46. The electricity distribution reset proposal regulatory information notice (paragraph 15) requires us to submit public lighting charges for the 2011 regulatory period. The charges are set out in Table 4–1.

Table 4–1: Public lighting OMR charges 2011-15

Light Type	OMR charge $ per light per year ($, nominal)				
	2011	2012	2013	2014	2015
Mercury Vapour 80 watt	38.15	41.40	43.19	45.81	48.83
Mercury Vapour 125 watt	56.08	60.86	63.48	67.35	71.77
Mercury Vapour 250 watt	72.53	77.64	81.14	85.50	90.19
Mercury Vapour 400 watt	81.59	87.35	91.29	96.18	101.47
Sodium High Pressure 50 watt	92.13	98.56	101.79	107.15	112.91
Sodium High Pressure 100 watt	100.97	108.03	112.90	118.93	125.41
Sodium High Pressure 150 watt	73.70	78.85	82.41	86.81	91.54
Sodium High Pressure 250 watt	75.55	80.88	84.52	89.06	93.95
Sodium High Pressure 400 watt	100.48	107.57	112.42	118.45	124.96
Metal Halide 70 watt	98.04	106.40	110.99	117.74	125.48
Metal Halide 150 watt	163.62	175.05	182.94	192.71	203.22
Metal Halide 250 watt	162.43	173.89	181.73	191.48	202.00
Fluorescent 40 watt	47.68	51.75	53.98	57.27	61.03
T5 – 2 x 14 W	24.79	26.13	27.27	28.63	30.01
T5 – 2 x 24 W	28.55	30.06	31.11	32.42	33.90
Compact Fluoro 32W	24.70	26.04	26.63	27.93	29.24
Compact Fluoro 42W	24.61	25.95	26.83	27.97	29.28
Fluorescent 20 watt*	47.68	51.75	53.98	57.27	61.03
Fluorescent 80 watt*	47.68	51.75	53.98	57.27	61.03
Mercury Vapour 50 watt*	47.68	51.75	53.98	57.27	61.03
Sodium Low Pressure 90 watt*	78.12	83.58	87.35	92.02	97.03
Sodium High Pressure 100 watt*	100.97	108.03	112.90	118.93	125.41
Sodium High Pressure 250 watt (24 hours) *	98.04	126.17	130.31	137.19	144.62
Induction 55 watt*	47.68	51.75	53.35	56.55	60.22
Incandescent 100 watt*	59.51	64.59	67.37	71.47	76.17
Incandescent 150 watt*	74.39	80.73	84.21	89.34	95.21

(1) *Obsolete lights have either been replaced or will be replaced by an equivalent light by 2015.