ATTACHMENT 9.1

RESPONSE TO AER DRAFT DETERMINATION ON PUBLIC LIGHTING

Contents

1. PURPOSE 3
2. SUMMARY 3
3. BACKGROUND 5
4. DISCUSSION 6
   - 4.1 Summary 6
   - 4.2 The AER Draft Decision 7
   - 4.3 The Appropriateness of the Bulk Lamp Replacement Rate 7
     - 4.3.1 Completion of the Bulk Lamp Replacement 9
   - 4.4 Spot Repair Efficiency 10
   - 4.5 Spot Failure Rates 10
     - 4.5.1 Failure rates compared with Ausgrid and Endeavour Energy 12
     - 4.5.2 Endeavour Energy Spot Attendance Rates 13
     - 4.5.3 AER Industry Benchmarking 13
     - 4.5.4 Increase in Attendance rates (Spot Failure Rates) due to a four yearly bulk lamp replacement cycle 14
   - 4.6 Corporate Overheads 16
   - 4.7 WACC 18
   - 4.8 Transcription Error in the Draft Decision 18
   - 4.9 Appropriateness of the Proposed Tariff Rates 18
     - 4.9.1 Total Tariff Income Benchmarking 19
     - 4.9.2 Maintenance Only Tariff Comparisons 19
   - 4.10 Public Lighting Tariff Schedule 20

APPENDIX A: Endeavour Energy Failure rates 21

APPENDIX B: AER response Victorian and Endeavour failure rates. 22

APPENDIX C: Calculated failure rates and Averages 24

APPENDIX D: Endeavour Attendance Rates 25

APPENDIX E: Ausgrid Attendance Rates 26

1. PURPOSE

The purpose of this paper is to present to the Australian Energy Regulator (AER) Essential Energy's response to the issues raised by the AER in the *Draft decision Essential Energy distribution determination (2015-16 to 2018-19) – Attachment 16: Alternate control services,* in particular those issues related to public lighting.

2. SUMMARY

Issues raised by the AER regarding Essential Energy's ancillary network services proposal and Essential Energy's response are highlighted in Table 2-1.

Essential Energy's public lighting service provided to local councils is significantly below cost reflective levels. For at least 10 years Essential Energy has not recovered sufficient revenues to compensate for the expense related to providing a public lighting service in accordance with obligations under the NSW Public Lighting Code.

Essential Energy is mindful of the impact on its customers of escalating charges, however the current situation is not sustainable. To ease the burden on customers, Essential Energy proposes to provide a service which aims to minimise costs and improve productivity. Our proposed revenue is less than our current costs and will require improvements in productivity to achieve full cost recovery, however if the AER does not allow our proposed cost reflective charges for public lighting and the draft determination becomes the final determination, a reduction in service levels well below those set out in the NSW Public Lighting Code will result.

Public lighting services are classified as alternative control under the NERs which means separate charges must be developed that clearly identify costs attributable to public lighting services. In effect, public lighting must operate as a stand alone business with clear accounting separation from standard control services. This means that if public lighting charges are not set on a cost reflective basis, a shortfall in revenue will occur when compared to the costs incurred in providing public lighting services. Shortfalls in revenue cannot be offset through standard controls services.

Essential Energy's revised proposal provides an increase that is 16 per cent less than the revenue requested in our initial proposal. It is acknowledged that even after this reduction the tariff increases are still going to be substantial for some councils in order for Essential Energy to recover its efficient costs of running the Public Lighting business.

It is clear after feedback through the Street Lighting Consultative Committee that some councils would prefer a transition period for any increases over multiple years rather than a large step in the 2015/16 year. Essential Energy is prepared to work with councils to assist in managing the step change, provided the cost reflective revenue is fully recovered over the regulatory period.

While Essential Energy's proposal is for cost reflective charges we welcome feedback from councils on any transition options that may reduce the initial increase but still return the full cost reflective revenue over the regulatory period. Essential Energy will continue to engage with councils and ROC representatives either directly or through the Streetlighting Consultative Committee, particularly in relation to revenue neutral transition options and any future reduction in service levels that may be required following publication of the AER's final decision.

Table 2-1: Summary of AER Issues and Essential Energy Response

AER issue	Summary of AERs reasons and findings	Essential Energy's response
Bulk lamp replacement cycle of three years is inefficient and four years is appropriate	The AER agrees that a bulk lamp replacement cycle that covers all luminaire types in the same cycle is more efficient. However it states that the three year cycle proposed by Essential Energy is not consistent with the efficient application of a four year cycle of Victorian distributors and Endeavour Energy.	Endeavour Energy does not operate a four year cycle but rather a blended three and four year cycle which is appropriate for their light density. 16.47 per cent of the Essential Energy luminaire population will have excessive lumen depreciation at four years and be non-compliant. Essential Energy proposes that: > the luminaire types with excessive lumen depreciation remain on a three year bulk lamp replacement cycle with all other luminaires on a four year cycle > When next spot failed or at the next bulk lamp replacement, any four year non-complaint luminaires will be replaced with a four year compliant alternative (and moved to the appropriate tariff) > Spot lamp failure rates will increase in the fourth year and Essential Energy has proposed a revised spot failure rate (spot attendance rate) to cover this additional cost.
Failure to apply the bulk lamp replacement cycle of three years	The AER believes Essential Energy has not applied the three year BLR cycle in accordance with the Public Lighting Management Plan.	Essential Energy has been operating the bulk luminaire replacement program in parallel with a bulk lamp replacement cycle. Where whole luminaires were replaced in an area, bulk lamp replacement was not required, as each new luminaire came with a new lamp. On the surface, it may appear as though the bulk lamp replacement targets have not been achieved, but this is not the case due to luminaire replacements.
The efficiency of spot luminaire repairs	Essential Energy proposed 1.5 tasks per truck roll and the AER propose three per truck roll.	Essential Energy agree with the weighted average tasks of three per truck roll.
The spot failure rate proposed by Essential Energy at a weighted average of 7.9 per cent is excessive and the AER has substituted it with rates of four to six per cent, with a weighted average of 5.21 per cent	Essential Energy benchmarks poorly with Endeavour Energy at 4.46 per cent and the Victorian distributors (MV80 – 3.75 per cent and T5 – 2.15 per cent).	This is an incomparable assessment of lamp failure rates to Essential Energy's total failure rates, for all purposes: > Endeavour Energy's spot failures quoted are for lamps only at 4.46 per cent > Victorian DNSP spot failure rates quoted are for lamp failure only > The AER has benchmarked Essential Energy on only one luminaire type that makes up 13 per cent of Essential Energy's luminaire population against the Victorian DNSP's to inform its decision > Essential Energy benchmarks well against Endeavour Energy and Ausgrid, with spot failure rates for all purposes of 13.63 per cent and 11.98 per cent respectively A further increase above 7.9 per cent to 8.78 per cent is required to accommodate the increased lamp failure rates due to the move to a four year bulk lamp replacement cycle. The Essential Energy asset management system records the history of spot failures on the actual luminaire in question. This data has been used to determine Essential Energy's expected spot failure rate.

AER issue	Summary of AERs reasons and findings	Essential Energy's response
The Corporate Overhead rate of 41.25 per cent is excessive	The AER has not seen overheads of this size in other jurisdictions, which calls into question the rate proposed. It has determined a reduction to 25 per cent.	Essential Energy rejects the AER amendment to overheads and continues to apply overheads in accordance with the AER-approved CAM methodology. The rate for the revised proposal after accommodating all proposed variances is 37.27%.
The WACC is excessive	The AER has rejected the 7.09 per cent WACC proposed by Essential Energy and substituted it with 5.06 per cent.	Essential Energy rejects the AER's revision of the WACC. Chapter 8 of the Revised Proposal details Essential Energy's main response and addresses in detail the appropriate WACC of 7.09 per cent.

Essential Energy has specific issues with the Draft Determination, as summarised in Table 2-2.

Table 2-2: Summary of Issues in the Draft Determination

Issue	Essential Energy's response
Transcription error in the Draft Determination publication of rates	The AER draft decision on public lighting includes a table of charges, Table 16-32. This table provides no indication of the year in which the tariffs apply. They appear to be 2014/15 charges as determined in the Interim Determination rather than 2015/16 charges. The Final Determination should nominate the tariff and the year for which the tariff is applied, which should be for 2015/16.
Appropriateness of the proposed tariff rates	The tariffs proposed in the Draft Determination are unreasonable, as: > Essential Energy collects on average approximately 40 per cent less revenue per luminaire than the nearest NSW DNSP.[1] > Light type comparisons show that these tariffs vary widely between the three NSW DNSPs.

3. BACKGROUND

Essential Energy, as part of the substantive regulatory proposal, provided cost reflective charges for public lighting for the regulatory control period 1 July 2014 to 30 June 2019. Essential Energy proposed significant increases to public lighting charges to correct long term under recovery of revenues when compared to efficient costs. In its draft decision, the AER rejected Essential Energy's public lighting charges. The AER states:

> *We do not approve Essential Energy's proposed public lighting charges because we consider some of the inputs into determining the level of charges do not reflect those of an efficient service provider[2].*

The AER's Draft Determination of $9.426 million has provided alternate charges that are on average 36.8 per cent lower than Essential Energy's proposed $14.916 million public lighting charges and are not viable to provide the required public lighting service. This attachment seeks to provide more detail on the approach and methodology used by Essential Energy to develop its proposed public lighting charges and address specific issues raised by the AER.

[1] See Table 4-8 Income Comparison p 18
[2] Draft decision Essential Energy distribution determination 2015-16 to 2018-19 Attachment 16: Alternative Control Services, AER, November 2014, p.49

4. DISCUSSION

In the draft decision, the AER raised concerns about Essential Energy's public lighting charges. This response addresses the following:

- the appropriateness of the Bulk Lamp Replacement cycle
- the efficiency of spot lamp repairs (tasks per truck roll)
- the appropriateness of spot failure rates (spot attendance rates)
- the appropriateness of the corporate overhead rate
- the appropriateness of the Weighted Average Cost of Capital (WACC)
- the appropriateness of the charges proposed in our substantive proposal.

Further this response will address the transcription error in the draft decision, which has resulted in the public lighting charges for 2014/15 having been applied to 2015/16.

4.1 Summary

Essential Energy does not consider the draft decision to be reasonable. Essential Energy considered the issues raised by the AER regarding Essential Energy's public lighting charges and has revised its proposal as detailed in Table 4-1.

Table 4-1: Summary of AER Issues and Essential Energy Response

Activity	Original Proposal	Draft Determination	Revised Proposal	Impact on Draft Determination
Bulk Lamp Replacement Cycle	3 year cycle	4 year cycle	3 & 4 year Hybrid cycle 16.47% luminaires remaining on 3 year cycle to be replaced with lumen, 4 year compliant luminaires as appropriate	$377,078
Spot Failure Rates	Weighted average 7.91%	Weighted average 5.21%	Weighted average 8.78%	$1,743,537
Tasks per truck roll	1.5	3.0	3.0	Nil
Corporate Overheads	41.25%	25.00%	37.27%	$1,505,470
WACC	7.09%	5.06%	7.09%	$331,710
Total Revenue	$14,916,885	$9,426,490	$13,270,288	$3,843,798[3]

[3] The individual impacts to not total to the total revenue impact as other immaterial factors reduce the total by approximately $114,000

Essential Energy has revised the public lighting model (refer Attachment 9.2) and tariff rate charges (refer Attachment 9.3).

4.2 The AER Draft Decision

The AER, in its draft decision, has identified inputs into Essential Energy's proposed public lighting charges that it considers do not reflect those of an efficient service provider:

- The bulk light (lamp) replacement rate (cycle)
- Spot replacements per day
- Lamp spot failure rates
- Overheads
- Weighted average cost of capital (WACC).

Further, the AER has stated that it considers the following benchmarks to be appropriate[4]:

- A four year bulk replacement program for lamps instead of the proposed three years
- Failure rates for the major lamp types of between four and six per cent per annum instead of a proposed average of 7.9 per cent
- Three lamp spot replacements per day instead of the proposed 1.5 replacements per day
- Divisional and corporate overhead/indirect costs of 25 per cent instead of the proposed 41.25 per cent
- A real pre-tax WACC of 5.06 per cent instead of the proposed 7.09 per cent.

These are discussed in more detail in the following sections.

4.3 The Appropriateness of the Bulk Lamp Replacement Rate

Essential Energy proposed a three year bulk lamp replacement cycle associated with the mix of luminaires within the Essential Energy fleet, with varying lumen output performance. A recent review of the luminaire types in the fleet has been completed and it has been determined that approximately 16.5 per cent of luminaires remain in the population, where lumen depreciation at four years would exceed that permitted under AS/NZS 1158. As such, Essential Energy proposes a staged transition with a three and four year hybrid cycle, with some minor exceptions, based on:

- Lamp and luminaire types on the network
- Lumen depreciation.

This has resulted in the following changes to the public lighting model:

- 83.5 per cent of luminaires should maintain compliant lumen output and have been modelled at four years
- 16.5 per cent of luminaires that cannot maintain the required lumen output at four years have been modelled at three years
- Essential Energy plans to progressively replace those luminaires that are non-compliant at four years, with some minor exceptions where no alternate is available. This will reduce the number of luminaires on a three year cycle
- A four year bulk lamp replacement cycle will result in an increased spot failure rate as lamp failures escalate in the fourth year. The increase in spot failures is detailed in section 4.5.4.

[4] *Draft decision Essential Energy distribution determination 2015-16 to 2018-19 Attachment 16: Alternative Control Services*, AER, November 2014, Section 16.7.1, p.16-49

The bulk replacement cycle used by each of the NSW DNSPs, as shown in the table below, is dependent on the type of lamps used on the network and optimisation of bulk replacements in comparison to spot replacements. Currently, all three DNSPs use a three year bulk replacement cycle (Endeavour three and four year).

Table 4-2: Existing Bulk Replacement Cycles

Metric	Essential Energy[5]	Ausgrid[6]	Endeavour Energy[7]
Bulk Replacement Cycle	3 years	3 years	3 years and 4 years

The composition of Essential Energy's population of lamps is different from Ausgrid and Endeavour Energy.

The 2009 AER Determination on public lighting determined that a four year cycle was appropriate for 150W, 250W and 400W HPS and CFL luminaires. All other luminaires were to have a three year bulk lamp replacement cycle. At that time the lamps that were determined to have a three year cycle accounted for 40 per cent of the luminaires on the Essential Energy network.

Due to the mixture of lighting types and technologies across the Essential Energy network, each location will have a mix of luminaires on three year and four year bulk lamp replacement cycles. There is currently a three year bulk lamp replacement cycle. If a mixture of three year and four year BLR cycles was adopted, each area would need to be covered by both cycles.

The majority of the bulk lamp replacement costs relate to labour, mobilisation and travel costs. Program delivery efficiency also needs to be considered. Essential Energy's public lighting assets are geographically dispersed; increased travel costs will apply where revisits to the same geographic area are required within short periods of time.

Between 2009 -2014, Essential Energy conducted various luminaire replacements resulting in the reduction of lamps requiring a three year bulk lamp replacement cycle to 16.5 per cent of its lighting population. The population and type of these lamps is detailed below in Table 4-3.

[5] *Attachment 8.1 Public Lighting Proposal*, Essential Energy, May 2014, section '1.6.6.4.1 Bulk Lamp Replacement'
[6] *Attachment 8.12 Public Lighting Opex Forecast*, Ausgrid, May 2014, section '3.6 Schedule maintenance assumptions'
[7] *Public Lighting Management Plan Issue 3 (2009-2014),* Endeavour Energy, March 2011, section '4.1 Planned Maintenance'

Table 4-3: Population and type of lamp at May 2014

Luminaire Type	4 year compliant fleet	3 year compliant fleet
High Pressure Sodium	66,151	
Mercury Vapour >80W	4,573	
Mercury Vapour 80W		20,536
Compact Florescent	55,274	
Metal Halide		605
Low Pressure Sodium		912
Linear Florescent		2579
Other[8]		216
Total	125,998	24,848
% of Fleet	83.5%	16.5%

Where possible, luminaires which do not meet the four year cycle (16,000 burn hours) or have uneconomic failure rates in the fourth year, will be transitioned out and replaced with an appropriate alternative technology where one is available. This replacement will occur on failure or at the next bulk lamp replacement cycle.

Essential Energy has identified that the following light types will incur excessive lumen depreciation and will require replacement to achieve a four year bulk lamp replacement cycle, where an alternative technology is available to replace obsolete technology:

- Low Pressure Sodium
- Linear Fluorescent
- Incandescent
- High Pressure Sodium Internal Igniter (not separately identified in tariff models)
- Mercury Vapour 80W.

Although lumen depreciation in the fourth year will be an issue, there is no alternate lamp replacement technology available for the Metal Halide lamps.

4.3.1 Completion of the Bulk Lamp Replacement

The determination referenced[9] concerns from the affected councils that the bulk lamp replacement had not been undertaken[10] [11]. This is not the case and will not impact the proposed charges.

[8] Other includes Incandescent
[9] *Draft decision Essential Energy distribution determination 2015-16 to 2018-19 Attachment 16: Alternative Control Services*, AER, November 2014, Section 16.7.4, p.16-54
[10] *Analysis of Essential Energy Proposal to the Australian Energy Regulator (AER)*, Strategic Lighting Partners LTD Management Consultants, Version 16, 7 August 2014, Clause 5.2, p.8
[11] *Submission Prepared for NSW Local Councils in Relation to Essential Energy's Public Lighting Proposal for the Regulatory Period Commencing 2015/16 Specifically Appendices 8.1, 8.2 and 8.3,* Energy and Management Services Pty Ltd, August 2014, Clause 7e, p.9

For clarity, the bulk lamp replacement involves the replacement of the lamp at a programmed time as part of a program of works, classified as operational and maintenance expenditure. By contrast, bulk luminaire replacement involves the replacement of the whole light fitting (inclusive of the lamp, housing, controls, diffuser) as part of a program of works, classified as capital expenditure.

The cost of the bulk luminaire replacement program is not factored into the streetlight business income and expenses[12] because it is a capitalised expense that is subject to customer contributions.

A full bulk lamp replacement cycle was completed between 2010/11 and 2012/13 in conjunction with a bulk luminaire replacement, i.e. some of the lamps that were programmed for replacement were replaced as part of the bulk luminaire replacement. Essential Energy did not replace new lamps that had already been replaced as part of the bulk luminaire replacement, shown in Table 4-4. The data in Table 4-4 has been updated since submitting the substantive proposal to ensure the capture of all work tasks, including tasks initially cancelled due to access but later reissued and completed.

Table 4-4: Lamp Replacements 2010/11 - 2012/13

Replacements	2010/11	2011/12	2012/13	Totals
Bulk Lamp Replacement	32,075	24,412	27,686	84,173
Bulk Luminaire Replacement	102	24,872	29,149	54,123
Total Replacements	32,177	49,284	56,835	138,296
Total Lights	145,299	146,696	148,822	145,299
Percentage Lamps Replaced				95.2%[13]

95.2 per cent of lamps were replaced between 2010/11 and 2012/13, including approximately 54,000 luminaires and a further 84,000 lamps. Roads and Maritime Services-owned lamps were not replaced during this cycle.

4.4 Spot Repair Efficiency

Essential Energy had submitted in its proposal that an average of 1.5 spot replacement tasks occur per truck roll to attend to spot failure tasks (attendances). The AER in its draft decision determined that on a weighted basis this should be three tasks per truck roll. Essential Energy accepts the decision of the AER in this regard.

Should the AER not accept the revised spot failure rates and revert to its draft decision position of a weighted 5.21 per cent, then the number of tasks per truck roll will need to revert to an average of 1.5 and the public lighting models will need to be modified to comply.

4.5 Spot Failure Rates

The AER draft decision's material reduction in spot failure rates (attendance rates) is unreasonable because:

- The AER has benchmarked lamp failure against Essential Energy's failure rate for all purposes
- The benchmark data used by the AER is not reflective of the luminaire population that Essential Energy manages
- The spot failure rate (attendance rate) for all purposes was extracted from Essential Energy's asset management system, where every task is recorded against each luminaire installation
- The AER's Draft Determination to move to a four year bulk lamp replacement cycle will increase the spot failures due to lamp mortality not being linear over time.

[12] *Attachment 8.1 Public Lighting Proposal* (the Public Lighting Proposal), Essential Energy, May 2014, Table 8, p.15
[13] % of laps replaced uses base of 2010/11 asset volumes since luminaires are always being added to the network

Essential Energy attendance rates (spot failure rates), as per the model, account for mobilising a work crew to attend a reported failure including all defined or observed site failures. These failures manifest in many forms including:

- lamp mortality
- fuses
- ballasts
- PE cells
- diffusers
- wiring faults
- master control point failures
- lumen depreciation
- theft and vandalism
- incorrect customer reporting.

Essential Energy experiences a weighted average light attendance rate of 7.9 per cent per annum under the current three year bulk lamp replacement cycle.

The AER has stated it considers failure rates for the major lamp types of between four and six per cent per annum more appropriate than the proposed weighted average of 7.9 per cent[14]. The AER position of between four and six per cent results in a weighted average failure rate of 5.21 per cent.

Essential Energy objects to the application of theoretical failure rates proposed by the AER because:

- manufacturers' failure rates are lower than actual observed failure rates
- manufacturers typically only provide mortality rates for lamps. They cannot provide mortality rates on installations
- lamp mortality rates are only one component of failure that drives attendance rates
- Essential Energy benchmarks well against Ausgrid and Endeavour Energy for attendance rates
- the AER has benchmarked Essential Energy against Victorian DNSPs with different luminaire populations.

A four year bulk lamp replacement cycle will increase the weighted average attendance rates due to an increasing lamp failure rate in the fourth year.

Essential Energy has recalculated the actual attendance rate inclusive of a hybrid three and four year replacement cycle and proposes the spot attendance rate for all purposes per annum will increase from 7.9 per cent to 8.78 per cent.

The Essential Energy Attendance Rates were calculated on the following basis:

- an extract of data from the WASP AMS for the financial year 2012/13
- the extract was taken at a time of a stable three year bulk lamp replacement cycle (earlier periods showing higher failure rates were excluded)
- work tasks were cleansed to remove any invalid tasks and any duplicate or multiple tasks on the same luminaire on the same day
- to minimise wide variations in small populations of luminaires, the failure rates were calculated as a weighted failure rate by technology. The included technology types are:

[14] *Draft decision Essential Energy distribution determination 2015-16 to 2018-19 Attachment 16: Alternative Control Services*, AER, November 2014, Section 16.7.1, p.16-49

- High Pressure Sodium (HPS)
- Mercury Vapour (MV)
- Metal Halide (MH)
- Low Pressure Sodium (LPS)
- Fluorescent (Fluoro)
- Incandescent (INC).

4.5.1 Failure rates compared with Ausgrid and Endeavour Energy

The attendance rates for Essential Energy, Endeavour Energy and Ausgrid are displayed in Table 4-5. The individual attendance rates by light type are not available at Endeavour; an average attendance rate only is available. It can be seen that Essential Energy benchmarks well against the other NSW DNSPs.

Table 4-5: Actual averaged Attendance Failure Rates for luminaire types[15]

DNSP	Essential Energy	Ausgrid	Endeavour Energy
Compact Fluorescent (CFL)	7.7%	15.4%	Light type failure data is not available for Endeavour
Fluorescent (Fluoro)		10.7%	
High Pressure Sodium (HPS)	9.55%	14.2%	
Low Pressure Sodium (LPS)	10.76%	14.4%	
Mercury Vapour (MV)	4.47%	10.3%	
Metal Halide (MH)	5.65%	12.1%	
Incandescent (INC)	0.56%	104.0%	
Weighted Total	7.9%	11.98%[16]	13.63%[17]

The AER in its draft decision stated that:

> *Endeavour Energy has achieved and is again proposing for the 2015–18 regulatory control period lower failure rates across its lamps of 4.46 per cent compared to Essential Energy (proposing 7.9 per cent). Victorian distributors are also achieving the lower failure rates in line with those proposed by Endeavour Energy. The MV80 in Victoria has an assumed failure rate of 15 per cent over four years (3.75 per cent per annum) and the T5 lamps an 8.6 per cent failure rate over four years (2.15 per cent per annum).*[18]

Essential Energy shows below in Section 4.5.2 that the statement above from the AER is erroneous and should be amended before it makes its final decision. The AER statement infers a proposed lamp failure rate of 7.9 per cent by Essential Energy. This is not what Essential Energy proposed. The proposal is for a spot failure rate (spot attendance rate) for all purposes of 7.9 per cent (weighted average) based on a three year bulk lamp replacement program. The Essential Energy attendance rate of 7.9 per cent compares favourably

[15] *Attachment 8.2_FY16/19_SLUOS OPEX*, Essential Energy, 2014, Tab 'Maintenance Cost', Column 'Spot Replacement Percentage per annum under bulk lamp regime'; *Attachment 8.13D Opex Cost Build up Model Public*, Ausgrid, 2014, Tab 'Input Inventory', Column 'Average annual failure under selected bulk cycle' provided call out rates for all failures for all components. *Attachment 8.12, Public Lighting Opex Forecast,* Ausgrid, May 2014, Table '8 – Unscheduled maintenance assumptions' provided PE Cell and other component failure rates (1.42% and 1.0% respectively), and these failure rates were subtracted from the failure rates for all components.
[16] Appendix E Ausgrid attendance rates
[17] Appendix D Endeavour attendance rates
[18] Draft decision Essential Energy distribution determination 2015-16 to 2018-19 Attachment 16: Alternative Control Services, AER, November 2014, Section 16.7.5, p. 16-56&57

with the attendance rates of Ausgrid and Endeavour Energy, which are 11.98 per cent and 13.63 per cent respectively, as detailed in Table 4-5.

4.5.2 Endeavour Energy Spot Attendance Rates

The AER submitted to Endeavour Energy request 027[19] which is in part reproduced in Appendix A. The Endeavour Energy response, also contained in Appendix A, related to 'lamp failures', not all failures requiring attendance as requested by the AER. Subsequent discussions with Endeavour Energy have confirmed this to be the case and the Endeavour Energy attendance rate for all purposes of failure is 13.63 per cent as listed in Table 4-5.

The 4.46 per cent lamp only failure rate quoted by the AER and shown in Section 4.5.1 above can be calculated from the installation fleet numbers and the implied failure volumes in the Endeavour Energy response 027.

Endeavour Energy clarified its initial response to the AER in a revised request 027 on January 5, 2015. The revised response is included in Appendix D. An extract of the revised response is included in Table: 4-6, which clearly shows a spot failure rate (attendance rate) of 13.63 per cent, not 4.46 per cent as asserted by the AER.

Table: 4-6 Endeavour Energy Spot Failure Rates – Response to AER Request 027

Year A	Street lights B	Lamp failures C	Lamp failure as a % of total street lights. D	Total OMS calls Number E	Total OMS calls as a % of total street lights. F
2008-2009	184,455	12,622	6.84%	25,861	14.02%
2009-2010	186,519	10,431	5.59%	27,267	14.62%
2010-2011	189,519	9,353	4.94%	29,143	15.37%
2011-2012	192,208	8,980	4.67%	26,444	13.75%
2012-2013	195,630	8,928	4.56%	25,412	13.00%
2013-2014	198,907	8,730	4.39%	27,126	13.63%

4.5.3 AER Industry Benchmarking

Essential Energy submitted a request to the AER for clarification on public lighting failure rates. The request is AER 006[20], in part reproduced in Appendix B.

The AER attached a file, which is reproduced in Table 4-7 with blank cells removed.

[19] Request for Information Response – AER Reference Number – AER Endeavour Energy 0027
[20] APPENDIX B: AER response Victorian and Endeavour failure rates

Table 4-7: AER Public Lighting Response Benchmarking Spreadsheet

Benchmarking	AER Vic Final Determination for 2015							AER NSW 2009 Proposal			2015-16 NSW Proposal			
	CitiPower	Powercor	United Energy	Jemena	SP AusNet	SP AusNet	Vic Average	Endeavour Energy	Essential Energy	Avg	Endeavour Energy	Essential Energy	Avg	AER Draft Decision
					Central	N East								
MV80 Failure rate per annum	3.75%	3.75%	4.9%	4.9%	2.68%	2.68%	3.78%	4.00%	4.00%	4.00%	4.46%	4.37%	4.42%	4.00%
HPS250 Failure rate per annum								4.00%	3.20%	3.60%	4.46%	6.01%	5.24%	5.00%
HPS150 Failure rate per annum								4.00%	3.20%	3.60%	4.46%	4.83%	4.65%	5.00%
Fluro42 Failure rate per annum								4.00%	4.00%	4.00%	4.46%	7.70%	6.08%	6.00%
HPS70 Failure rate per annum								4.00%	3.20%	3.60%	4.40%	13.94%	9.17%	5.00%
2x14w T5 Failure rate per annum	3.75%	3.75%	2.85%	2.85%	2.85%	2.85%	3.15%							

Embedded as a note in each of the Victorian DNSP cells in the spreadsheet supplied by the AER is the following comment:

Proportion of lamps that fail between bulk change divided by Lamps - bulk change

A number of conclusions can be drawn from the AER benchmarking file:

- the failure rates for the Victorian DNSPs are lamp failure rates based on the note attached to each cell replicated above
- the Endeavour Energy lamp failure rate of 4.46 per cent against all luminaire types is as supplied in Request 027 and is a lamp failure rate only, as stated by Endeavour in their response
- of the six luminaire types benchmarked with the Victorian DNSPs, only one is the same as that operated by Essential Energy - being the MV80 - of which it is only 13 per cent of the Essential Energy population
- the 2x14w T5 Luminaire quoted in Victoria is not used by Essential Energy
- The Essential Energy Failure Rate is a failure rate (attendance rate) for all purposes, not just lamp failure. Therefore, the benchmarking table above is incomparable.

4.5.4 Increase in Attendance rates (Spot Failure Rates) due to a four yearly bulk lamp replacement cycle

The spot attendance rates that Essential Energy submitted in its proposal were based on a three year bulk lamp replacement cycle including failures for all purposes.

The AER has proposed that the bulk lamp replacement cycle move to four years. Essential Energy has agreed to a three and four year hybrid model for all luminaires where the survival rate is greater than 81 per

cent and the luminous flux is greater than 70 per cent .This will ensure compliance to AS/NZS1158, where possible.

Luminaires (lamps aside and given the wide variation in luminaire ages) in general can be expected to display a reasonably linear failure rate whether lamps are bulk changed every three or four years. Lamps for public lights, however, do not show a linear failure rate and failure typically drops off markedly in the final year of operation. This can be seen in Figure 1 where the manufacturers' lamp-only mortality for a typical lamp is shown. This is for a 42W CFL, the most common luminaire in the Essential Energy population.

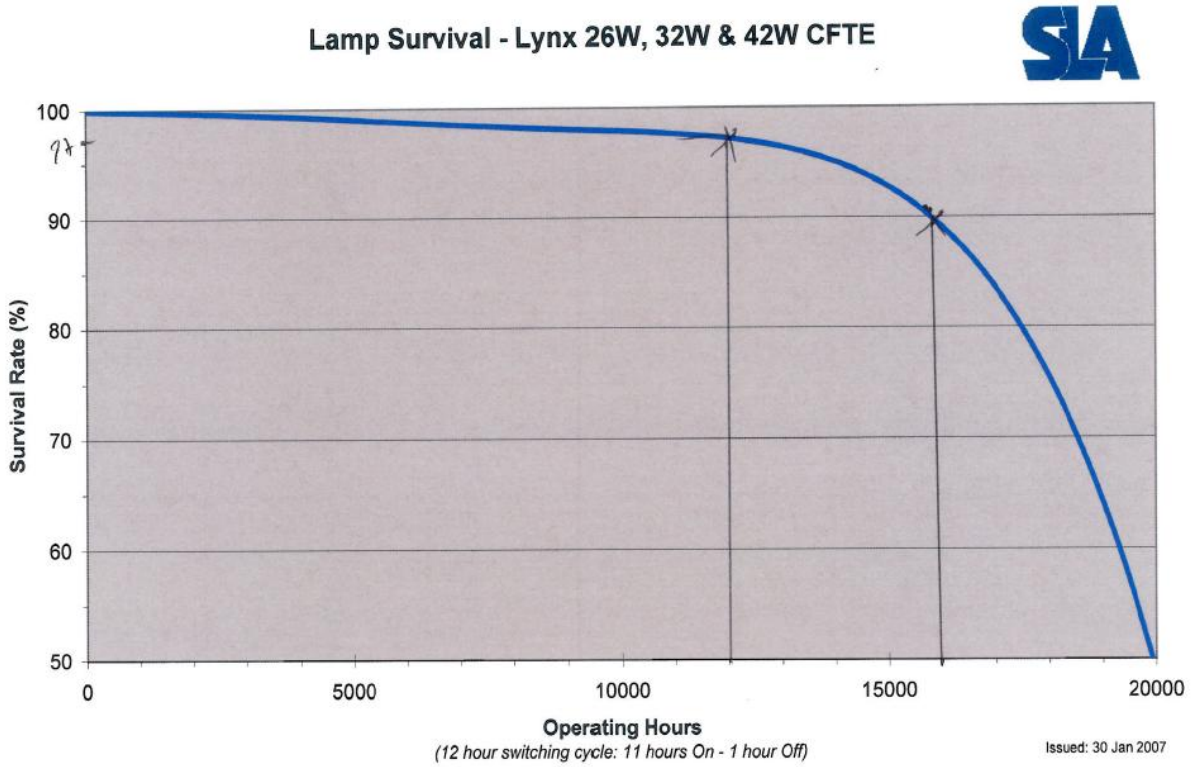

Figure 1: Lamp Survival[21]

Figure 1 shows the 42W CFL lamp mortality in the first three years is reasonably linear to a survival rate of approximately 97 per cent. In the fourth year of operation, the survival rate drops from 97 per cent to 90 per cent. In order to determine the impact of the four year bulk lamp replacement cycle, Essential Energy has recalibrated the historical failure rates by technology as follows:

- the standard spot failure rates for all purposes have been used for all four years as witnessed under a three year bulk lamp replacement cycle
- for each lamp type, the incremental lamp-only failure rate sourced from manufacturers in the fourth year of operation has been added
- a new weighted average failure rate per technology is then calculated
- the calculation can be represented by the following formula:

  ((4 years x SA) + (LS4 - LS3) – (LS3 / 3 years))/4 years

  Where:

  SA = Spot Attendance annual rate under a three year bulk lamp replacement cycle

  LS3 = Lamp survival rate at three years

[21] Sylvania Lighting Australia – Lamp Survival Data Sheet - Lynx 26W, 32W & 42W CFTE

LS4 = Lamp survival rate at four years.

The three to four year spot failure model is detailed in Appendix C. Table 4-8 shows the recalibrated failure rates by technology under a three and four year bulk lamp replacement cycle. The weighted average failure rate under a hybrid three and four year bulk replacement cycle is 8.78%.

Table 4-8: Spot Attendance Rates under 3 & 4 Year Hybrid Bulk Lamp Replacement Cycle

Luminaire Technology	Actual Weighted Average Annual Spot Attendance Rate under a 3 year Bulk Lamp Cycle	Calculated Annual Spot Attendance Rate under a 4 year Bulk Lamp Cycle
Luminaires on 4 year cycle		
Mercury Vapour other than 80W	4.47%	5.01%
HPS Twin Arc	7.25%	7.47%
HPS Standard	9.55%	10.88%
Compact Fluorescent	7.7%	8.53%
Luminaires on 3 year cycle		
Mercury Vapour 80W	4.47%	Excessive Lumen Depreciation
Metal Halide	5.65%	Excessive Lumen Depreciation
Linear Fluorescent	7.7%	Excessive Lumen Depreciation
Low Pressure Sodium	10.76%	Excessive Lumen Depreciation

Essential Energy has in section 4.5.1 shown that its attendance rates for spot failure have been captured from its Asset Management System and benchmark well against Endeavour and Ausgrid. Further, Essential Energy has shown in sections 4.5.2 and 4.5.3 that the AER's basis of benchmarking Essential Energy's attendance rate with Victorian DNSPs and Endeavour Energy is ineffective and has driven an incorrect result. In Section 4.5.4, we have shown the increasing effect of moving from a three year to four year bulk lamp replacement cycle where this is possible.

4.6 Corporate Overheads

In reviewing Essential Energy's Alternative Control Services Substantive Proposal, the AER noted:

> *Essential Energy's proposal to apply a 41 per cent divisional and corporate overhead cost on top of its public lighting charges in not considered efficient. We have not seen overheads for distribution businesses set at such high rates and the evidence from other jurisdictions calls into question the quantum of overheads Essential Energy sought. We consider an efficient benchmark is the application of a 25 per cent indirect charge as applied in Victoria and as proposed by Ausgrid. We have adopted this for Essential Energy*[22]

Upon review of the AER draft decision, Essential Energy highlights the following issues:

- the percentage of overhead for public lighting is determined through Essential Energy's AER approved CAM

[22] Attachment 16: Essential Energy Draft Decision, Attachment 16: Alternative control services, p58

- the level of 25 per cent is lower than that used to set the capitalised overhead rate for standard control capital expenditure. The basis for these differences is not clear to Essential and no further detail is provided
- the methodology that has been used to determine the proposed reduction oversimplifies the inherent limitations of comparing overhead rates across businesses. As noted within the cost categorisation section of this attachment, the accounting treatments and cost classifications vary considerably across the DNSPs. It is therefore problematic to make simple comparisons without correcting for these differences.

Categorisation of costs

Essential Energy notes there are a broad range of approaches used across the DNSPs in categorising costs. While the AER has cited the use of all expensed and capitalised overheads *"because opex overheads are affected by a service providers' capitalisation policies*[23]*,* this issue does not mitigate the impact of variable categorisation of costs between overheads and direct operating expenditure.

Essential Energy, through its cost allocation methodology, tends to treat a greater portion of its costs as overheads when compared to many other DNSPs. This difference in treatment of costs means that equivalent costs are treated as direct costs and therefore form part of unit rates. This issue is discussed within Attachment 6.4 Corporate and Divisional Overheads.

These variations are more apparent in the case of businesses where a greater proportion of work is performed by contracted parties. In its review of benchmarking, Heugin noted:

> *Many of the overhead costs reported by the NSW and ACT businesses are absorbed into the contract costs for direct maintenance activities for the frontier businesses, as the frontier businesses generally outsource more work*[24]

The decision to outsource work does not of itself imply an increased level of efficiency, however to consider overhead costs without accounting for these issues can be problematic. The inconsistency in cost classification affects the ability to conduct meaningful comparisons between DNSPs.

In Figure 4, Essential Energy has modelled a scenario to illustrate the impact of different blended service delivery models on overhead rates. The scenario assumes a business model that mainly outsources its network operations. The rationale being that if the work was outsourced, Essential Energy would not incur the level of overhead it currently recognises through its current costs categorisation. The outsourced functions would be invoiced to Essential Energy by the contractor and the invoice amount would be loaded with both an element of corporate and network overhead. This split would not be visible on the invoice and the whole invoice would be processed as a direct cost.

This transfer of overhead to an effective direct cost increases the direct cost pool while reducing the overhead pool and thus has a compounding effect on the overhead rate (as the direct costs in the denominator increase and the overhead costs in the numerator decrease - hence the overhead rate reduces).

[23] Draft Decision Essential Energy distribution determination 2015-16 to 2018-19 Attachment 7: Operating expenditure p7-80
[24] Technical response to the application of benchmarking by the AER, Huegin Consulting, p43

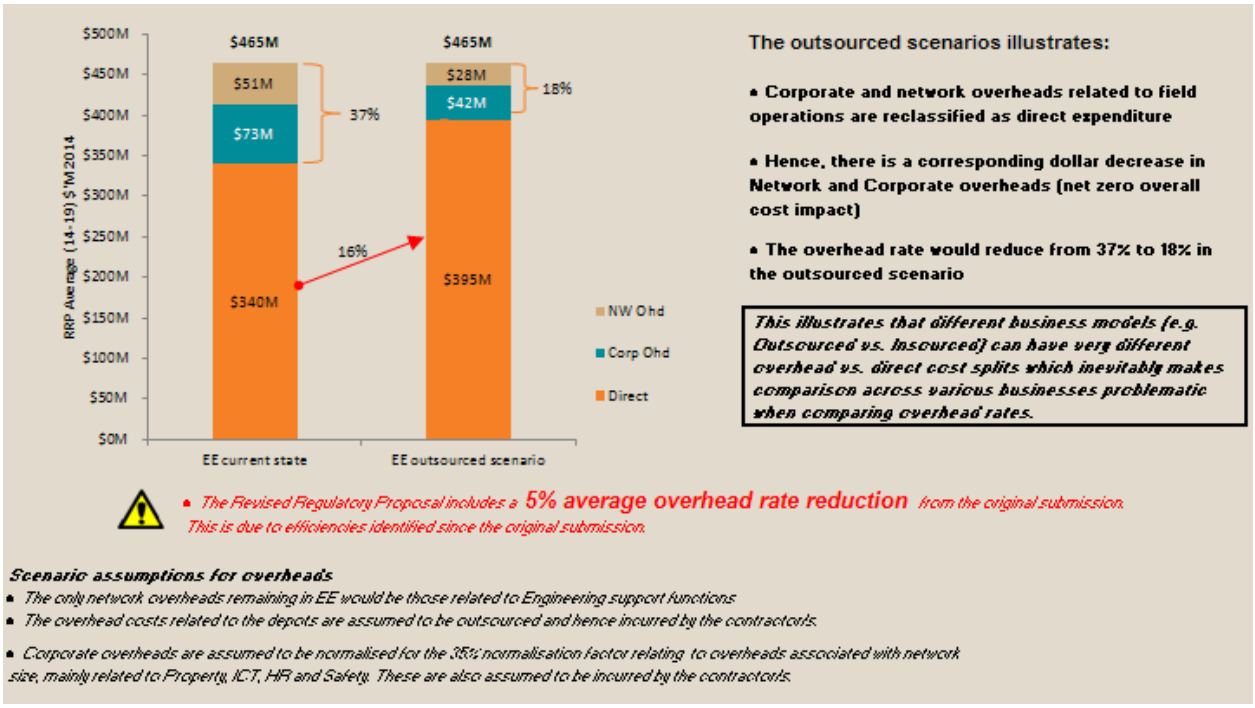

Figure 4: Impact of outsourcing on direct and overhead cost categorisation

The revised public lighting models submitted by Essential Energy have been developed using the CAM, where many costs that have a nexus to direct labour are included in the 37.27 per cent Corporate Overhead. For this reason, the corporate overhead rate of 37.27 per cent should be accepted by the AER rather than their proposed reduction to 25 per cent, as a reduction to 25 per cent prevents Essential Energy from recovering all of its costs in accordance with the CAM and the structure of the Public Lighting models.

4.7 WACC

The draft determination for the WACC of 5.06 per cent compares unfavourably to Essential Energy's proposal of 7.09 per cent. Details of Essential Energy's revised proposal in relation to WACC can be found in our revised regulatory proposal and Chapter 8.

4.8 Transcription Error in the Draft Decision

The AER draft decision on Public Lighting includes a table of charges, Table 16-32. This table provides no indication of the year in which these charges apply, however they appear to be 2014/15 as determined in the interim determination. In the final determination the AER are requested to publish the 2015/16 charges..

4.9 Appropriateness of the Proposed Tariff Rates

The AER has made three draft decisions for the NSW DNSPs relating to public lighting. In this section Essential Energy compares those decisions at a high level and at a more granular level for specific luminaire types. The AER should consider these comparisons in their final determination as the results are counter intuitive and show that Essential Energy is being required to provide a public lighting service at lower cost than peer businesses.

4.9.1 Total Tariff Income Benchmarking

The draft decision proposed public lighting charges are unreasonable and inconsistent with the proposed tariffs for Endeavour Energy.

Based on the draft determination Essential Energy is required to provide public lighting services at a lower cost than Ausgrid and Endeavour. Given the remote nature of the Essential Energy network and the low luminaire density, this is a counter intuitive result. The AER should consider this fact in making its final determination. Essential Energy would collect 46 per cent less revenue per luminaire than the nearest NSW DSNP, as shown in Table 4-9.

Table 4-9: Income comparison

Metric	Essential Energy	Ausgrid	Endeavour Energy
Number of Luminaires	***150,846***	***248,660***	***195,630***
$ Requested Income (2015/16)	$14,916,885	$43,410,000	$18,860,000
$Requested Income/luminaire (2015/16)	$98.88	$174.58	$96.41
$ Existing Income 2014 /15 -Actual	$8,940,000	$40,120,000	$20,210,000
$ Income/luminaire (2014/15)- Actual	$59.27	$163.34	$103.31
Draft Approved Income	$9,426,491	$42,975,900	$18,012,000
$ Draft Income/luminaire	$62.49	$172.83	$92.07

4.9.2 Maintenance Only Tariff Comparisons

The Essential Energy draft decision benchmarks low compared to the NSW peers. The AER has determined a materially lower tariff per luminaire for Essential Energy over Endeavour Energy. Essential Energy's individual charges are lower than those proposed for Endeavour Energy, by 24 – 48 per cent for common light types on tariff 4.

The comparison tariff type four has been selected because:

- there is no capital recovery
- tariff type 4 is maintenance only
- all tariff types will include a maintenance allowance
- in the case of Essential Energy, all tariff types include the same maintenance allowance
- tariff 4 is only applied post 2009, so any historical issues are not included.

The AER has determined a materially lower charge for Essential Energy over Endeavour Energy, on a like for like basis as shown in Table 4-10. It is incongruous that both decisions can be correct. This raises uncertainty about the reasonableness of the proposed Essential Energy tariffs and further supports the evidence in Table 4-9 Income Comparison, where Essential Energy's public lighting income is well understated on a per luminaire basis ,which draws significant doubt over the AER's draft decision.

Table 4-10: Light Type Comparison

Tariff 4 Light Type [25]	Essential Energy Population	Published Endeavour Energy Draft Determination Rate per Annum[26]	Published Essential Energy Draft Determination Rate per Annum[27]	Variance % ( ) Negative
HPS 70 W ST	27,453	$73.34	$44.17	(39.8)%
HPS 250W ST	21,897	$74.89	$59.26	(20.9)%
MV 80W	20,536	$71.50	$36.97	(48.3)%
42W CFL	55,274	$73.16	$47.18	(35.5)%

4.10 Public Lighting Tariff Schedule

Attachment 9.3 details Essential Energy's revised capital and maintenance tariffs to be applied in 2015/16 shown in $2013/14.

[25] Single light on a shared or no pole with a bracket minor<=3m.
[26] Published Draft decision Endeavour Energy distribution determination 2015-16 to 2018-19 Attachment 16: Alternative Control Services, AER, November 2014, Section A.1.3, p.16-72 (2015/2016 $) – Tariff Type 4
[27] Draft decision Essential Energy distribution determination 2015-16 to 2018-19 OPEX SLUOS Model – Model used as published rates in determination are in error and for 2014/15 year – Tariff Type 4

APPENDIX A: ENDEAVOUR ENERGY FAILURE RATES

The AER submitted to Endeavour Energy request 027[28], which is in part reproduced below:

Public lighting

> *The Endeavour public lighting model does not clearly set out the values for the following inputs which are used to calculate public lighting prices. Please provide values for the following inputs used to calculate proposed public lighting prices:…….. Spot failure rates – for the following: Fluro 42, HPS 70, HPS 250, MV80, HPS 150.*

Endeavour Energy responded in part as follows:

> *The table below includes the total number of public lighting installations and the number of **lamp failures** as well the relevant percentage total of our population. We would note that prior to 2010/11 Endeavour had been behind our targeted bulk lamp replacement program that has since been addressed. Further we also converted to longer life 80W mercury lamps as part of the planned programs which has also contributed to the improvement and which is now currently over 50% of our current lamp population.*
>
> *If we extend the high level failure rates to the population of the technologies requested, we can imply the data as represented in the table below which provides an assumed failure volume noting that this assumes the average failure rate from the table above.*

Table 0-1: Endeavour Energy expected attendance rates

Light Type	Installation fleet #'s	% of total installations	Implied failure volumes
Fluro 42	*15,033*	*7.68*	*670*
HPS70	*1,364*	*0.69*	*60*
HPS250	*27,231*	*13.92*	*1,215*
MV80	*91,405*	*46.72*	*4,079*
HPS150	*15,240*	*7.79*	*680*

> *Anecdotally however, there is an expectation that the average method understates the failure rates for the Fluro 42 technology and is expected to overstate the failure rates for the HPS technologies. Essential Energy is currently reviewing whether tariff related information on an installation by installation basis will provide the visibility of the detailed data requested by the AER, however this is expected to take time to develop and cross- check.*
>
> *While at this stage* Essential Energy *has not been able to obtain visibility of the spot failure rates for the specific technologies in question, the business makes the assumption that spot failure volumes would be commensurate with the representation of the population for each technology type.*

[28] Request for Information Response – AER Reference Number – AER Endeavour Energy 0027

APPENDIX B: AER RESPONSE VICTORIAN AND ENDEAVOUR FAILURE RATES.

Question to AER- Eddie Caruana:

Under the title; Maintenance Charges on page 16-56, about half way down the page..

> *....Our draft decision failure rates are based on assessment of manufacturers claimed failure rates and actual failure rates for different light types being achieved across the NEM.....taking into account observed rates can often be higher in the field than what is determined by manufacturers.....*

Furthermore the last paragraph compares *Endeavour Energy's lamp failure rates at 4.46 %* found by Endeavour during both bulk replacement and also failed light attendances (bundled). *Victorian Distributors at 5%...*

Does the AER have supporting statistical data (Victorian) to explain its position on this statement?

How was this calculated and what reasoning is behind this?

Did the AER regard ‘actual" reported failures offered by Essential Energy as total actual mobilised field attendances for all types of spot failures (Table 16-22) or only spot lamp failures?

AER reply by John Skinner:

Hi Natalie,

Please find attached and below our response to question ESSENTIAL AER 006.

The AER took a benchmark approach in regards to setting the efficient maintenance assumptions for NSW distributors.

The AER’s draft decision for Essential Energy has taken into account the failure rates reported by Endeavour Energy and the failure rates assumed for Victorian distributors in their determination.

The Victorian distributors and Endeavour Energy failure rates vary across businesses but on average are below the failure rates reported by Essential Energy.

The AER has also considered and taken into account the data from the 2009 final determination (referenced in tables 17.3 and 17.5) to come to the draft decision.

Similar to Essential Energy’s proposed approach of averaging failure rates across light types, the AER has used this approach in its draft decision in setting average failure rates across the HPS and MV light types.

In deciding on the failure rates the AER has weighed up all of this information and also taken into account Essential Energy’s failure to achieve the bulk replacement program target from 2009 to 2014 (referred to in table 16-23).

The AER understands and accepts the proposed and reported figures by Essential Energy as all types of spot failures not just spot lamp failures.

We are happy to have further discussions about this with Essential Energy in the New Year.

Regards,

John

Also the AER attached the following table:

Benchmarking	AER Vic Final Determination for 2015							AER NSW 2009 Proposal			2015-16 NSW Proposal			AER Draft Decision
	CitiPower	Powercor	United Energy	Jemena	SP AusNet	SP AusNet	Vic Average	Endeavour Energy	Essential Energy	Avg	Endeavour Energy	Essential Energy	Avg	
MV 80														
Failure rate per annum	**3.75%**	**3.75%**	**4.9%**	**4.9%**	**2.68%**	**2.68%**	**3.78%**	**4.00%**	**4.00%**	**4.00%**	**4.46%**	**4.37%**	**4.42%**	**4.00%**
HPS 250														
Failure rate per annum								**4.00%**	**3.20%**	**3.60%**	**4.46%**	**6.01%**	**5.24%**	**5.00%**
HPS 150	*Essnetial Energy has also made transparent the comments boxes for the cells directly below :*													
Failure rate per annum								**4.00%**	**3.20%**	**3.60%**	**4.46%**	**4.83%**	**4.65%**	**5.00%**
Fluorescent 42	*Innes, Nick:*													
Failure rate per annum	*Proportion of lamps that fail between bulk change divided by Lamps - bulk change*							**4.00%**	**4.00%**	**4.00%**	**4.46%**	**7.70%**	**6.08%**	**6.00%**
HPS 70														
Failure rate per annum								**4.00%**	**3.20%**	**3.60%**	**4.40%**	**13.94%**	**9.17%**	**5.00%**
2 x14 w T5														
Failure rate per annum	**3.75%**	**3.75%**	**2.85%**	**2.85%**	**2.85%**	**2.85%**	**3.15%**							
HPS Average										**3.60%**			**6.35%**	

ESSENTIAL ENERGY - AER RESPONSE - DRAFT DETERMINATION 2015-19

Luminaire Size	Manufacturer	Lamp Life Type	Luminaire Volumes	Four Year Compatible	2013 /2014 AER Model Submission	3 year Weighted Average (volume & %)	Luminious Flux Behaviour - 3 years 12,000hrs	Luminious Flux Behaviour - 4 years 16,000hrs	Survival Rate - 3 Years 12,000hrs	Survival Rate - 4 Years 16,000hrs	Lamp failure rate (year 4) (Manuf. Data)	Average annual Lamp failure rate (years 1 - 3) pa (Manuf. Data)	Additional incremental failure rate in 4th year pa (Manuf. Data)	4 year average failure rate pa (actual + 4th year Manuf. Data)	3/4 Year weighted average (Volume & %)	Attendances on 3 & 4 year Hybrid cycle	AER Average Draft Determination pa	2013 /2014 AER Model Submission Luminaire Volumes	Calculated AER DD failures
Compact Fluorescent 42	Sylvania	Standard	55,274	Yes	7.70%	4256	82%	81%	95%	90%	5.0%	1.7%	3.3%	8.53%	4717		6.00%	55,274	3316
Compact Fluorescent Sub Total			55,274	Yes	CFL	7.70%	4256 Faults						Compact Fluorescent	CFL	8.53%	4717 Faults	Compact Fluorescent		
High Pressure Sodium 50	Sylvania	Standard	812	Yes	9.55%	78	91%	90%	90%	79%	11.0%	3.3%	7.7%	11.47%	93		5.00%	66,151	3308
High Pressure Sodium 70	Sylvania	Standard	27,453	Yes	9.55%	2622	91%	90%	90%	79%	11.0%	3.3%	7.7%	11.47%	3148				
High Pressure Sodium 150	Sylvania	Standard	9,205	Yes	9.55%	879	90%	88%	93%	90%	3.0%	2.3%	0.7%	9.72%	894				
High Pressure Sodium 250	Sylvania	Standard	21,897	Yes	9.55%	2091	91%	90%	96%	90%	6.0%	1.3%	4.7%	10.72%	2347				
High Pressure Sodium 400	Sylvania	Standard	2,001	Yes	9.55%	191	90%	88%	93%	90%	3.0%	2.3%	0.7%	9.72%	194				
High Pressure Sodium Other	Sylvania	Standard	646	Yes	9.55%	62	91%	89%	92%	86%	6.8%	2.5%	4.3%	10.62%	69				
High Pressure Sodium Sub Total			62,014	Yes	HPS	9.55%	5922 Faults						High Pressure Sodium	HPS ST	10.88%	6745 Faults			
High Pressure Sodium 50	Sylvania	Twin-Arc	2,084	Yes	7.25%	151	91%	90%	98%	95%	3.0%	2.3%	0.7%	7.42%	155				
High Pressure Sodium 70	Sylvania	Twin-Arc	1,156	Yes	7.25%	84	98%	96%	98%	96%	2.0%	1.3%	0.7%	7.42%	86				
High Pressure Sodium 150	Sylvania	Twin Arc	222	Yes	7.25%	16	90%	88%	93%	90%	3.0%	0.7%	2.3%	7.83%	17				
High Pressure Sodium 250	Sylvania	Twin Arc	642	Yes	7.25%	47	91%	90%	96%	90%	6.0%	4.7%	1.3%	7.58%	49				
High Pressure Sodium 400	Sylvania	Twin Arc	33	Yes	7.25%	2	90%	88%	93%	90%	3.0%	0.7%	2.3%	7.83%	3				
High Pressure Sodium Twin Arc Sub Total			4,137	Yes	HPSTA	7.25%	300 Faults						High Pressure Sodium Twin Arc	HPS TA	7.47%	309 Faults	High Pressure Sodium		
Mercury Vapour 50	Sylvania	Standard	2,265	Yes	4.47%	101	83%	83%	89%	79%	10.0%	6.3%	3.7%	5.39%	122		4.00%	4,573	183
Mercury Vapour 125	Sylvania	Standard	646	Yes	4.47%	29	78%	77%	97%	92%	5.0%	4.0%	1.0%	4.72%	30				
Mercury Vapour 250	Sylvania	Standard	770	Yes	4.47%	34	84%	78%	99%	98%	1.0%	0.7%	0.3%	4.55%	35				
Mercury Vapour 400	Sylvania	Standard	872	Yes	4.47%	39	85%	80%	98%	95%	3.0%	2.3%	0.7%	4.64%	40				
Mercury Vapour Other	Sylvania	Standard	20	Yes	4.47%	1	83%	80%	96%	91%	4.8%	3.3%	1.4%	4.82%	1				
Mercury Vapour Sub Total			4,573	Yes	MV	4.47%	204 Faults						Mercury Vapour	MV 5.01%		229 Faults	Mercury Vapour		
Low Pressure Sodium Other	Sylvania	Standard	912	No	LPS	10.76%	98 Faults					3 yr		LPS 10.76%		98 Faults	6%	912	55
Other Linear Fluorescent	Various	Standard	2,579	No	Linear Fluoro	7.70%	199 Faults					3 yr		Linear Fluoro 7.70%		199 Faults	6%	2,579	155
Mercury Vapour 80	Osram	Standard	20,536	No	MV80	4.47%	918 Faults					3 yr		MV 80 4.47%		918 Faults	4%	20,536	821
Metal Hallide Other	Sylvania	Standard	605	No	MH	5.65%	34 Faults					3 yr		MH 5.65%		34 Faults	4%	605	24
Incandescent Other	Sylvania	Standard	216	No	INC	0.56%	1 Faults					3 yr		INC 0.56%		1 Faults	0.56%	216	1
Other Sub Total			24,848	No			11933 Total Faults												
		Total	150,846		3 yr Total Weighted Average	7.91%	Non compliant 4 year Luminaires 24848		Non Compliant % of total 16.47%		3 & 4 year Hybrid total Weighted Average pa 8.78%					13250 Faults	Total AER population	150,846	7863

AER DD Weighted Average failure rate pa: 5.21%

Note: "MV Other" mortality and lumen depreciation is average of all other MV listed types "HPS Other" mortality and lumen depreciation is average of all other HPS listed types

APPENDIX D: ENDEAVOUR ATTENDANCE RATES

Email from John Hocking Endeavour Energy to John Skinner AER

Date: 5 January 2015

Time: 2.19pm

Subject: FW AER ENDEAVOUR 027

John

Sometime back Endeavour Energy had responded to AER reference number : AER Endeavour Energy 027.

It has come to our attention that some details provided on page 5 of this response submitted under item 'f' may have the potential for confusion.

Specifically the rate of lamp failures has the potential to be confused with the rate of total call outs for public lighting installations in aggregate.

To make the data clearer, we have added two additional columns to the data already submitted to provide the total outages. These two columns are marked 'E' and 'F' in the attachment.

The rest of the information remains the same. The inconvenience caused is regretted.

For easy reference the same table is copied below:

Year A	Street lights B	Lamp failures C	Lamp failure as a % of total street lights. D	Total OMS calls Number E	Total OMS calls as a % of total street lights. F
2008-2009	184,455	12,622	6.84%	25,861	14.02%
2009-2010	186,519	10,431	5.59%	27,267	14.62%
2010-2011	189,519	9,353	4.94%	29,143	15.37%
2011-2012	192,208	8,980	4.67%	26,444	13.75%
2012-2013	195,630	8,928	4.56%	25,412	13.00%
2013-2014	198,907	8,730	4.39%	27,126	13.63%

Regards,

Jon Hocking
Manager Network Regulation
D: 02 9853 4386
F: 02 9853 6376
M: 0407 348 156
T: 131 081
E: jon.hocking@endeavourenergy.com.au
51 Huntingwood Drive, Huntingwood NSW 2148
PO Box 811 Seven Hills NSW 1730
www.endeavourenergy.com.au

APPENDIX E: AUSGRID ATTENDANCE RATES

From: John Bedding <jbedding@ausgrid.com.au>

To: Remko.Verschuur@essentialenergy.com.au

Date: 05/01/2015 11:00 AM

Subject: Re: Spot Failure Rate

Lamp type	Total call out rate	Estimated lamp failure rate	Draft Decision Failure rates
MBF1x125	13.57%	5.73%	4.00%
MBF1x250	11.83%	5.00%	4.00%
MBF1x400	12.53%	5.29%	4.00%
MBF1x42 (CFL)	15.41%	6.51%	6.00%
MBF1x50	18.91%	7.99%	4.00%
MBF1x80	8.26%	3.49%	4.00%
SON1x100	13.44%	5.68%	5.00%
SON1x150	12.57%	5.31%	5.00%
SON1x250	13.12%	5.54%	5.00%
SON1x400	14.40%	6.08%	5.00%
SON1x70	12.10%	5.11%	5.00%
TF1x40	15.85%	6.70%	6.00%
TF2x20	10.29%	4.35%	6.00%
Average	13.25%[29]	5.60%	4.85%

Regards,

John Bedding | Senior Engineer | Street Lighting | Ausgrid

Level 1, 25-27 Pomeroy Street, Homebush NSW 2140 AUSTRALIA
: 02 8260 1747 (Extn 31747) | □: 02 8260 6493 (Extn 36493) | □: 0439 591 432 | :

[29] The 13.25% is a simple average failure rate. The weighted average failure rate is 11.98%