EnergyAustralia

Submission for the AER's re-determination of public lighting prices 2010 to 2014

January 2010

Contents

Contents (continued)

1. Summary

This submission to the AER proposes that the AER re-make its determination with respect to EnergyAustralia's alternative control services (public lighting) by starting with the final determination and determining those aspects of the final determination that should be re-examined based on the directions and recommendations of the Australian Competition Tribunal.

EnergyAustralia submits that the following aspects of the final determination should be re-examined and the final determination varied in the following ways.

- Chapter 2 – EnergyAustralia proposes that the opening 2009 **regulatory asset base (RAB)** value in the AER's final determination be varied from $111m to $142m to be consistent with the return of capital in the prices approved by IPART over the past 5 years.
- Chapter 3 – EnergyAustralia proposes that the **operating expenditure** allowance for 2010 be varied from $13.2m to $16.28m based on efficient costs. This amount would be escalated by the wage index and CPI approved in the final determination.
- Chapter 4 – EnergyAustralia proposes that the control mechanism be varied by **separating the maintenance costs** from the fixed capital charge.
- Chapter 5 – EnergyAustralia proposes that the control mechanism should include a formula to calculate the **residual value**, which is payable by a customer when the customer requests the early replacement of assets.
- Chapter 6 **–** EnergyAustralia outlines **other errors** identified by the Tribunal which EnergyAustralia has considered in preparing proposed prices and charges.
- Chapter 7 – EnergyAustralia proposes the prices and revenue specified in each control mechanism include the same **annual price change** incorporating actual CPI, forecast wage cost index (approved in the final determination) and customer contributed amounts during the year (where relevant). This will increase transparency and understanding of customer charges.

EnergyAustralia has included schedules of prices and charges for our pre July 2009 and post June 2009 public lighting assets. This is based on changes to inputs and assumptions which we have identified in this submission

1.1 Basis for Submission

The Australian Competition Tribunal (Tribunal) determined that the AER's decision on the control mechanism for alternative control services be remitted back to the AER to make the decision again in accordance with a series of directions and recommendations.[1] Upon the making of that decision, the AER's (previous) decision[2] on the control mechanism for alternative control services will be set aside.

Consistent with the intention of the Tribunal and the parties, EnergyAustralia proposes that the AER re-make its determination with respect to public lighting services by taking as its starting point the final determination and then determining those aspects of the final determination that should be re-examined based on the directions and recommendations of the Tribunal.

This submission addresses those aspects of the final determination which EnergyAustralia considers should be revisited by the AER when re-making its decision. These matters include:

- the calculation of the value of the regulated asset base for the purposes of calculating the capital charge for assets constructed prior to 1 July 2009 (Tariff 1) as set out in Table 17.1.2 and sections 17.6.4.2-17.6.4 of the previous decision. This is addressed in Chapter 2;

[1] Australian Competition Tribunal, *Application by EnergyAustralia and others (No 2) ACompT 9,* 25 November 2009.
[2] AER Final Decision, *NSW Distribution Determination 2009-2010 to 2013- 2014*, 28 April 2009 (AER Final Decision),- Chapter 17 and Appendix P, Q and R.

1. Summary (continued)

- the assessment of operational expenditure and in particular maintenance charges applicable to assets constructed before and after 1 July 2009 (set out in sections 17.5 of the previous decision). This is addressed in Chapter 3;
- the calculation of the tariff for public lighting assets replaced at the request of a customer before the end of their economic lives as set out in 17.7.4.3 of the previous decision. This is addressed in Chapter 4;
- the structure of the schedule of charges for assets constructed before 1 July 2009 as set out in section 17.6 of the previous decision. This is addressed in Chapter 5;
- the correction of conceded errors, to the extent that they remain relevant, as listed in direction 5(6) of the Tribunal's directions. These errors have been addressed in this submission either by the Model prepared to support EnergyAustralia's forecast operating costs or in the calculation of the value of the regulated asset base referred to in Chapter 6;
- the Prices and price paths for assets constructed after 30 June 2009 and set out in Appendix R. This is addressed in Chapter 7.

This submission does not address the following elements of the AER's previous decision as we did not consider that it was necessary for these elements to be revisited by the AER. However if the AER does propose to revisit these aspects, EnergyAustralia requests that it be provided with an opportunity to make a further submission to the AER to address these matters.

- The asset base roll forward methodology (pre 1 July 2009 assets) and annuity methodology (post 1 July 2009 assets).
- Negotiable Components of public lighting services set out at paragraph 17.4.2;
- Tariff Classes set out at Table 17.2;
- The application of a building block approach for pre 1 July 2009 assets;
- The application of an annual annuity capital charge for each public lighting asset constructed after 30 June 2009 as set out in section 17.7 of the previous decision;
- Cost escalation inputs such as CPI, wages and materials escalation.

It is also assumed that the AER's decision[3] to make pass through provisions of the transitional rules apply to alternative control services will be maintained and that all of the events nominated in the distribution determination will apply to all direct control services.

Tribunal Directions

The Tribunal made a number of directions in relation to the re-making of the decision for public lighting. These directions included:

- that the AER make the decision using a building block approach incorporating an asset base roll forward for pre 1 July 2009 public lighting assets and an annuity approach for post 30 June 2009 public lighting assets (5(2));
- that in making the decision the AER apply the rate of return parameters to public lighting services that are consistent with the Tribunal's determination on the rate of return for direct control services (5(3));

The Tribunal also made directions in relation to submissions to be made by EnergyAustralia in the course of the AER making the decision again, including that the submissions:

[3] AER Final Decision, section 15.5.2.1 at page 282.

- must address the value of, and methodology for determining, the efficient operating expenditure required by EnergyAustralia for each year of the regulatory control period in order to operate and maintain its public lighting assets, with the efficient level of operating expenditure to be supported by a detailed model whereby the efficiency of inputs and assumptions for all key maintenance aspects are explained and justified (5(4)(a));
- may include information and material that was not before the AER when it made its original decision, such as the "IPART" letter which is identified in paragraph 57 of the Tribunal's reasons for directions dated 16 October 2009 (5(4)(b)); and
- may address the value of, and methodology for determining, the regulatory asset base for use in the building block approach for pre 1 July public lighting assets (5(4)(c)).

The directions made by the Tribunal provided that, to the extent they remain relevant, in making the decision again, the AER must correct those parts of its final determination that the AER has conceded are in error (5(6)). The errors conceded by the AER are listed in Order 5(6) of the Tribunal's directions.

Proposed Timetable

Finally, in making the decision again, the Tribunal directed the AER to have regard to submissions made to the AER in accordance with the timetable in the directions and any other information or material requested by the AER in the course of making the decision again (5(5)).

- 7 January 2010 (4pm): EnergyAustralia provides a confidential and non-confidential version of its submission to the AER;
- 8 January 2010 (4pm): AER publishes EnergyAustralia's submission;
- 21 January 2010 (4pm): parties interested in responding to EnergyAustralia's submission provide their submissions to the AER;
- 25 February 2010 (4pm): the AER publishes a draft decision;
- 11 March 2010 (4pm): submissions in response to the AER's draft decision by provided to the AER; and
- 15 April 2010 (4pm): the AER publishes its final decision.

1.2 Regulatory Context

The service known as "the construction and maintenance of public lighting infrastructure" is regulated under the Transitional Chapter 6 Rules (Transitional Rules) as a distribution service and classified as direct control service and further classified as alternative control service[4]. The term "construction and maintenance of public lighting infrastructure" is derived from IPART's Final Determination for NSW Distribution businesses in 2004[5]. IPART defined public lighting infrastructure" as

> "the structures, wiring, globes and other equipment:
>
> (1) used for, or associated with, the provision of public lighting to streets roads and other public places; and
>
> (2) which are connected or attached to (or which form part of) a DNSP's distribution system."

For ease of reference these services are referred to in this submission as public lighting services.

[4] Transitional Rules, Clause 6.2.3B(b)(1)
[5] IPART, *NSW Electricity Distribution Pricing 2004/05 to 2008/09: Final Report*, 10 June 2004, pp 171 – 172

1. Summary (continued)

The control mechanism determined by the AER for alternative control services is subject to Part B of the Transitional Rules and may utilise elements of Part C of those Rules[6].

NSW Public Lighting Code

At the jurisdictional level, public lighting services are subject to the NSW Public Lighting Code (the Code)[7].

Compliance with the code is not mandatory, however the AER has indicated that it considers it appropriate to assess the DNSP's services against the Public Lighting Code and that it expects DNSPs will be able to meet the requirements of the Code.[8]

It should be noted that the Code applies to "Public Lighting Services" as defined in the Code which appears to be a more detailed definition than the construction and maintenance of public lighting infrastructure". However, for practical purposes EnergyAustralia has treated the two definitions as consistent with each other.

EnergyAustralia's Public Lighting Management Plan

EnergyAustralia has adopted and implemented a number of aspects of the NSW Public Lighting Code. These arrangements are set out in EnergyAustralia's Public Lighting Management Plan published in June 2006 and were also detailed in its June 2008 Regulatory Proposal.[9] That proposal indicated that there were some aspects of the Code that EnergyAustralia will endeavour to meet notwithstanding that the expenditure forecasts did not include the costs of meeting those requirements.

Under its existing (2006) Public Lighting Management Plan, EnergyAustralia sets out its approach to the following:

- public lighting maintenance programme, including details of outage detection, lamp replacement and equipment disposal, luminaire cleaning and inspection, vegetation management and Condition Monitoring and Maintenance Analysis and includes a bulk lamp replacement cycle of 30 months;
- public lighting inventory recording and billing ;
- reporting arrangements;
- approach to minor capital works;
- minimum service standards for a 24 call centre for fault reports, repairs to public lightings assets (within 8 working days on average per customer per year) and undertaking cyclic maintenance and lamp replacement programme;
- guaranteed service levels consistent with those set out in the Code;
- publication of a standard luminaire list;
- arrangements for non-standard luminaires, in accordance with the Code; and
- arrangements for Service Level Agreements.

[6] Transitional Rules: Clause 6.2.6(c). Rule 11.15.2(a) of the National Electricity Rules provides that Chapter 6 of the Rules applies in relation to the NSW and ACT DNSPs in respect of the regulatory control period 2009-2014 as if that Chapter were amended so as to be in the form set out in Appendix 1 to the Rules (the Transitional Rules)

[7] Department of Energy, Utilities and Sustainability (now part of Industry and Investment NSW), *The NSW Public Lighting Code,* January 2006

[8] AER, *Final Decision – Guideline on "Control Mechanisms for alternative control services for the ACT and NSW 2009 distribution determinations*, February 2008

[9] EnergyAustralia, *Public Lighting Management Plan,* June 2006, EnergyAustralia, *Regulatory Proposal*, 2 June 2008, pages 199 and 200.

Since the preparation of the June 2008 proposal EnergyAustralia has proceeded with the development and deployment of a new inventory and billing system and several other initiatives directed at improving its implementation of the Code.

Future changes to the Public Lighting Code and Public Lighting Management Plan

The NSW Public Lighting Code is currently under review by Industry and Investment NSW. [10] The possible outcomes of that review have not been factored into EnergyAustralia's submission and forecast operating expenditure. At this stage of the review it is not proposed that adoption of the Code be made mandatory for NSW DNSPs[11]. Submissions on the Discussion Paper are due 12 February 2010, but the timetable for conclusion of the review is not known at this stage.

At the time of writing this submission EnergyAustralia was in also in the process of preparing to consult with its Public Lighting Customers on a revised management plan to apply from 1 July 2010.

An updated plan is likely to reflect the application of EnergyAustralia's new management structure to public lighting services and those further aspects of the Code which EnergyAustralia is aiming to meet. These include:

- EnergyAustralia's policy on Minor Capital Works;
- the development and deployment of a new inventory and billing system through our Integrated Asset Management System (IAMS) referred to above and
- the evaluation and trialling of new technologies.

[10] NSW Department of Industry and Investment: *NSW Public Lighting Code Review*, December 2009.
[11] Op Cit p 6.

Subject to the above modifications and consideration of any proposed changes to the Code, EnergyAustralia's revised 2010 plan is expected to be substantially the same as its 2006 Plan.

1.3 Outline of our Submission

Regulatory Asset Base

EnergyAustralia submits that the opening value for its regulatory asset base that is rolled forward for financial year 2009 be consistent with prices IPART approved for the 2005-09 period and the return of capital reflected in those prices.

EnergyAustralia sought additional information from IPART in relation to the calculation of it prices in 2005. Based on this new information, EnergyAustralia sought advice from NERA Consulting on the opening RAB value that is consistent with previous regulatory decision, financial capital maintenance and NEL and NER requirements.

EnergyAustralia recommends the AER adopt an opening RAB value of $142.4 million consistent with NERA's analysis and conclusions.

This is higher than the RAB included as part of the AER's determination of $111.3 which EnergyAustralia and NERA agree is below the value required to be consistent with previous regulatory decisions, financial capital maintenance and NEL and NER requirements.

Operating Expenditure

EnergyAustralia is seeking to vary the AER's decision in respect of assumed operating expenditure and substitute a new value of $16.260 million (FY10) based on a component build up of input assumptions. This is based on revised input assumptions which include:

- a bulk lamp replacement period of 3 years for all lamps;
- bulk lamp materials and labour cost assumptions based on competitively tendered contract rates;

1. Summary (continued)

- revised spot failure rates for lamps which in many cases are below the failure rate assumptions included in the AER's final determination;
- assumptions regarding spot maintenance materials costs based on historic purchase prices;
- assumptions regarding labour costs based on rate charges used for non-contestable customer specific services;
- assumptions regarding time taken for each spot maintenance task based on field observation;
- assumptions regarding overhead and elevated work platform charges consistent with industry benchmarks with additional overhead to reflect quarterly inspections undertaken by EnergyAustralia.

EnergyAustralia's operating expenditure assumptions are informed by a detailed model which derived total annual operating expenditure based on input assumptions. EnergyAustralia sought the assistance of PB Consulting in ascertaining whether the amount forecast represented an efficient forecast of operating expenditure.

Pricing arrangements for assets replaced at the customers request

EnergyAustralia is seeking the determination to be varied so that the AER specifies a clear and specific control mechanism for the determination of the charge for the residual capital asset being replaced early.

Our submission outlines the issues surrounding early replacement of assets under a "fixed charge" regime. We note particularly the obstacles this creates in ensuring price transparency and offer an alternative approach which would improve transparency, minimise uncertainty and still meet the AER's preferred control mechanism.

Separating capital and operating charges for customers

EnergyAustralia is seeking the determination to be varied so that the AER specifies a clear and specific control mechanism for the determination of the charge for the residual capital asset being replaced early.

Our submission outlines the issues surrounding early replacement of assets under a "fixed charge" regime. We note particularly the obstacles this creates in ensuring price transparency and offer an alternative approach which would improve transparency, minimise uncertainty and still meet the AER's preferred control mechanism.

Rectification of other errors in the model

The submission sets those errors identified by the Tribunal (that have not already been outlined in earlier chapters) which EnergyAustralia has considered in preparing proposed prices and charges.

Annual Price change

EnergyAustralia's submission includes proposed price changes that are consequential to our submission. We outline how we have derived prices for pre 1 July and post 1 July 2009 assets.

2. Regulatory Asset Base

EnergyAustralia's submission sets out what EnergyAustralia considers is the appropriate opening regulatory asset base value as at 1 July 2009 consistent with the Rules and the Law:

- Section 1 outlines the theory supporting EnergyAustralia's methodology and approach to establishing the appropriate opening asset value
- Section 2 outlines the AER's decision in the final determination on the regulatory asset base value and why EnergyAustralia considers that the value needs to change to meet the requirements of the Rules and the Law
- Section 3 provides analysis of the assumptions used by IPART in determining prices for 2005-2008 and relevantly, the assumptions regarding the return of capital underpinning allowed prices
- Section 4 summarises our recommended approach for establishing the opening asset base for public lighting and our proposed regulatory asset value for the purposes of the AER re-making its decision
- Section 5 notes the other errors corrected in respect of the regulatory asset value

2.1 Basis for submission

Element of Decision that EnergyAustralia is seeking to have re-examined and varied

In this submission to the AER on the re-making of the decision relating to public lighting, EnergyAustralia seeks the opening value for its regulatory asset base that is rolled forward for financial year 2009 to be consistent with prices IPART approved for the 2005-09 period and the return of capital reflected in those prices. Our proposed approach is in accordance with the principle of financial capital maintenance.

EnergyAustralia is not making further submissions on the decision to adopt a roll forward approach.

Tribunal Directions

In making directions on submissions and the associated timetable for lodging of submissions, the Tribunal directed that EnergyAustralia may address the value of, and methodology for determining, the regulatory asset base for use in the building block approach for pre 1 July 2009 public lighting assets.

The Tribunal also directed that EnergyAustralia's submission may include information and material that was not before the AER when it made its original decision, such as the "IPART letter" identified by the Tribunal in paragraph 57 of its reasons for directions[12].

Tribunals Reasons

On the material before it the Tribunal found no reviewable error in respect of the Regulatory Asset Base determined by the AER. However, the Tribunal considered that more material could have assisted the AER in determining whether EnergyAustralia had a claim. In particular, the Tribunal thought material in the form of a letter from IPART to EnergyAustralia may assist the AER in considering the matter further.

2.2 The importance of asset valuation in economic regulation

This section outlines the importance of asset valuation in a regulatory context and the regulatory approaches to valuing assets within and between periods.

In a regulatory context, the valuation of the asset, together with the assumed remaining life of an asset and depreciation profile (eg, real straight line), determine the depreciation schedule. In turn, the depreciation schedule is used to both determine regulatory revenues during the regulatory period (ie, the return of capital component of revenues) and to depreciate

[12] In its Directions, the Tribunal noted: "There is sought to be brought before us material in the form of a letter from IPART to EA that may assist the AER in considering the matter further. That material was not a review related matter: (see s 71R(6)). Once the determination of the AER is set aside and the matter is remitted… the AER can take into account the IPART letter (and other material) in determining what course of action it should take in relation to this issue." See: Australian Competition Tribunal, *Application by EnergyAustralia ACompT 7,* 16 October 2009, paragraph 57.

the value of asset (usually referred to as regulatory asset base or RAB) when undertaking an asset roll forward to arrive at the appropriate opening value for the following regulatory period.

Regulators apply the same depreciation methodology (ie, standard lives and profile) in both calculating revenues and rolling forward the asset base, to ensure that a firm is able to fully depreciate its regulated investments over the assumed life of the assets, and does not over or under recover the value of those assets.

The **economic life** of an asset is the period over which an asset is expected to contribute to the production of goods and services for consumers. Assets are depreciated over their useful economic life to the current holder of the asset.

The **remaining life** of an asset is an estimate of the expected period of time before the end of that asset's useful economic life.

The term remaining life has a number of meanings depending on its context. For example:

- an engineer will form an opinion when an asset will need to be replaced after considering the physical condition of the asset and scheduled maintenance;
- alternatively, in an accounting context, remaining lives are generally prescribed through recognised accounting standards.

The asset life assumed for the purpose of determining regulatory depreciation need not equal the physical or accounting asset lives.

A regulator may wish to adjust the depreciation profile by varying the assumed asset life in order to:

- achieve certain pricing outcomes (eg, to moderate price shocks);
- achieve a constant revenue stream; or
- provide a greater up front revenue allowance.

Assumptions surrounding remaining lives and depreciation in engineering, accounting and regulatory contexts are therefore not necessarily interchangeable and may in fact differ considerably.

In the next section we outline the importance of the depreciation profile in regulatory asset valuation and investment returns.

2.3 The importance of asset valuation in economic regulation

There are two general approaches to asset valuation:

- a **lock-in approach**, under which the opening RAB at the start of each regulatory control period is calculated on the basis of the previous opening RAB, rolled forward on the basis of outturn inflation, actual (prudent) capex and depreciation, calculated in a manner consistent with the last determination (using either actual or forecast capex); and
- a **periodic revaluation approach**, under which, the opening RAB at the start of each regulatory control period is calculated on the basis of a revaluation of the value of the assets (for example, on a depreciated optimised replacement cost (DORC) basis).

Periodic revaluation of physical asset base

Under the periodic revaluation approach:

- the RAB is determined on the basis of replacement cost in the initial year of the regulatory period;
- this value would be rolled-forward during the regulatory period, on the basis of an appropriate cost escalator (ie, CPI under the AER's Final Decision);
- the RAB would be revalued at the start of each regulatory period, on the basis of an updated current replacement cost (ie, periodic optimisation);
- the introduction of periodic revaluations means that Financial Capital Maintenance need not hold; and
- EnergyAustralia is subject to additional risk that assets are revalued higher or lower than expected.

Roll forward of financial asset base

Under the building block approach applied to standard control services:

- the RAB is determined on a roll-forward basis, taking the closing RAB from the last regulatory period and adding in new capital investment;
- there is no periodic revaluation of the RAB at the start of each regulatory period. This approach is characterised as Financial Capital Maintenance (FCM) and ensures that investors recover the (efficient) cost of their investment;
- under this approach, depreciation represents the return of the cost of the original investment.
- FCM may be complemented by stronger incentives for within period capex efficiencies, however the underlying assumptions in relation to asset lives and depreciation profiles remain consistent between the earlier regulatory determination and the roll-forward;
- there can be uncertainty in establishing the appropriate starting RAB, due to lack of data. However, once the starting RAB is established, rolling-forward the asset base is relatively straightforward as it requires no formal judgement as to the physical value of the assets.

2.4 AER Decision

Different approaches for new vs old assets

The AER's final determination utilised two approaches for determining public lighting charges:

- for post 1 July 2009 assets, the AER has applied a capital charge for each public lighting asset, valued based on efficient material and installation costs. Where possible the AER used current market cost to determine the appropriate value[13];
- in respect of assets constructed prior to 1 July 2009, the AER has applied a capital charge based on a Regulatory Asset Value using a roll forward of the value established by the previous regulator, IPART[14].

In making this decision, the AER noted that it took into account EnergyAustralia's proposal and relevant submissions that a periodic replacement valuation applies to all of its assets, not just assets constructed after 1 July 2009.

The AER's reasons and considerations for rejecting EnergyAustralia's proposal in the context of the Rules and Law are important for this submission.

Basis for rejecting periodic valuation for pre 1 July 09 assets

The AER rejected EnergyAustralia's proposal to base the capital charge for all assets using a periodic valuation of the asset base.

Fundamental to its decision to reject EnergyAustralia's proposal was the AER's reasoning that asset age and value assumptions must be treated consistently with what previous regulators applied.

Under this reasoning, any outcome which does not preserve age and value assumptions from the previous regulator could result in windfall gains and losses for DNSPs and customers, primarily from differences in the profile of depreciation under the two approaches.

The extract from the AER's final determination appears below:[15]

> The AER considers that when a change in the asset valuation approach and/or price setting methodology occurs part way through the life of a regulated asset, and the age and value of the assets are not treated consistently, then a consequence can be excess or deficient returns, or the assessment of such returns could be obscured.
>
> In its regulatory proposal, EnergyAustralia calculates its charges based on an annuity approach that relies on replacement costs. The AER is concerned that in changing from a building block method to a replacement cost annuity method customers will pay

[13] AER Final Decision p380-381
[14] AER Final Decision p334.
[15] AER Final Decision p364-365.

charges beyond what is efficient on EnergyAustralia's existing stock of assets.

Under a building block method with depreciation calculated on a straight line basis allowable revenues will be greater at the outset of the asset's life and will diminish as the asset ages. In other words, charges are at their highest for the first half of an asset's life under a building block approach.

With respect to EnergyAustralia's current charges and proposed asset lives, the AER considers that customers should be entitled to receive lower capital charges in recognition that they have already paid higher charges in the past. Such an approach does not prevent EnergyAustralia from recovering the efficient costs of new public lighting assets installed after 30 June 2009 (as these are captured under the AER's tariff 3) or restrict its ability to recover the efficient cost of maintaining these assets.

Maintaining a building block approach for assets constructed before 1 July 2009 draws a 'line in the sand', allowing the NSW DNSPs to achieve a normal return on, and of, capital over the life of their existing public lighting assets while at the same time allowing customers to receive reduced prices to reflect the fact that they have already paid higher costs. In short, it is not appropriate to change to an annuity method part way through an assets life and not preserve age and value assumptions as this can result in windfall gains and losses for DNSPs and customers, primarily from differences in the profile of depreciation under the two approaches. Fundamentally, this is why the AER requires different approaches to the calculation of capital charges for new and existing assets.

2.5 Establishing the correct RAB value

AER's calculation of Opening RAB

Having made its decision to apply a financial roll forward of a previous RAB value in order to preserve asset value and life assumptions (thereby mitigating any risk of windfall gains or losses), the AER substituted an asset base roll-forward methodology to calculate the return on assets constructed before July 2009, observing that:

> …for the purposes of pricing services provided by existing assets the AER prefers a valuation derived from the previous determination utilising the AER's formula, on the basis that it is consistent with previous regulatory decisions and the depreciation that has occurred.[16]

In establishing the 1 July 2009 regulatory asset base value input to its limited building block method, the AER took the following steps, it:

- established the 30 June 2004 regulatory asset base value as $97.8m, and used this as an input into cell "C15" of the "RAB" sheet;
- deducted depreciation from the opening RAB value, by the amounts set out in the table below:

2004-05	2005-06	2006-07	2007-08	2008-09
10.9	11.8	12.8	14.0	14.9

- added EnergyAustralia's actual capital expenditure from 1 July 2003 to 30 June 2007, and an estimate of capital expenditure from 1 July 2007 to 30 June 2009; and
- added indexation on the opening RAB value.

This calculation resulted in an opening RAB value of $111.3 million for 1 July 2009, which is the value the AER included in table 17.12 of its final determination under a column entitled "Opening RAB proposed by the NSW DNSPs".

The AER's opening RAB value was not part of EnergyAustralia's proposal

From documents before the Tribunal, it is clear that the AER's opening RAB value is based on what the AER believed to be an amount EnergyAustralia proposed or put forward.

> The above submissions ignore (or at least understate) the fact that the RAB value of $111.3 million included

[16] AER Final Decision pages 370-1

> by the AER in its building block model was provided by EnergyAustralia. [17]
>
> Subsequent to providing its revised regulatory proposal, EnergyAustralia provided the AER with a detailed RAB spreadsheet that set out the depreciation allowances and other calculations to arrive at the RAB value for 30 June 2009 of $111.3 million. [18]
>
> In its supplementary draft decision of 6 March 2009, the AER adopted the RAB of $111.3 million put forward by EnergyAustralia. [19]

It is also evident that the AER relies on the value of $111.3 million based on spreadsheet information provided to the AER at the time of EnergyAustralia's January 2009 submission and the following representation made as part of this submission:

> Since the June 2008 proposal, EnergyAustralia has revised its public lighting RAB as a result of a more detailed analysis of remaining component lives.
>
> Our current RAB value for 30 June 2009 is $111.3 million. [20]

EnergyAustralia can also understand how the particular comment in its January proposal could be misconstrued. However, our submission must be considered in the context of our overall response to the AER on this matter, including the context of our January submission as well as submissions made in our regulatory proposal and March submission where we provide substantial evidence suggesting that the RAB was much higher than what the AER finally substituted.

Following the November Draft Determination, the AER requested that EnergyAustralia perform certain modelling on the basis of an average remaining life assumption. The average remaining life used was based on the 2002/2003 asset age of 11.2 years. These models were submitted by EnergyAustralia to the AER on 6, 20 and 30 January 2009 in response to the AER's requests.

EnergyAustralia's January submission noted that it did not intend to revise its June 2008 proposal:

> This chapter should be read as a submission in the context of the AER's consideration of public lighting, and a response to the AER's information request rather than a revised proposal with respect to the control mechanism for the construction and maintenance of public lighting.[21]

We repeated this in our April submission and subsequent submissions to the Tribunal.

We therefore reiterate our submissions made in the hearing before the Tribunal in relation to whether we proposed or revised our proposal to $111.3 million.

Nevertheless, the issue now before the AER is not who proposed the $111.3 million opening RAB value but whether it is correct.

The AER's consideration of RAB issues

In its 3 April 2009 submission, EnergyAustralia made the following substantive observations regarding the RAB roll forward[22]:

> The AER is aware that IPART, when making its determination for public lighting in 2005, set prices based on a deferral of depreciation charges. IPART rejected EnergyAustralia's original proposal for depreciation and instead accepted a significant downward revision of the depreciation allowance. By doing so, the prices set by IPART were lower than the true cost of providing the service and would lead to higher prices in future years to recover this cost…

[17] AER *Outline of Submissions to the Australian Competition Tribunal, Part C.4 EnergyAustralia Specific Matters*, 11 August 2009, paragraph 10

[18] Ibid paragraph 14

[19] Ibid paragraph 15

[20] EnergyAustralia, *Revised Proposal and Interim Submission*, January 2009, page 174

[21] Ibid p172

[22] EnergyAustralia *Submission on the AER's Public Lighting Supplementary Draft Decision* 3 April 2009, page 10-11

2. Regulatory Asset Base (continued)

Table 2 shows the RAB as calculated by the AER using straight line depreciation. The decision to establish an asset base using straight line depreciation under values the true value of EnergyAustralia's public lighting asset base, in that it assumes a higher return of capital has been received than has actually been received. Using the AER's March 2009 draft decision prices for assets installed prior to 1 July 2009 do not reflect the correct RAB and are inappropriately low.

The AER's final determination noted EnergyAustralia's argument in favour of using a higher opening RAB, but rejected this argument.

The AER also noted that the suggestion by EnergyAustralia that its previous charges were derived applying deferred depreciation is new information of which EnergyAustralia had not previously sought the AER's consideration[23]

> …the AER did not accept EnergyAustralia's increased RAB of $142.8 million because EnergyAustralia had not put forward sufficient evidence to establish that IPART had allowed the lower depreciation as claimed by EnergyAustralia.
>
> …IPART's Statement of reasons… did not make any reference to the depreciation allowed to EnergyAustralia… EnergyAustralia had previously stated that IPART did not make any determination as to depreciation.
>
> … EnergyAustralia did not put evidence before the AER that established that IPART had made a binding regulatory decision that constrained EnergyAustralia in respect of the depreciation allowance it could recover.
>
> … EnergyAustralia raised the issue of the depreciation allowed by IPART late in the regulatory process and some time after submitting a RAB of $111.3 million, which it had described at the time as being based on a "more detailed analysis of remaining component lives"

EnergyAustralia would argue that the RAB values provided in its original proposal and January and April 2009 submissions directly addressed the issue of IPART's allowance for depreciation when setting prices.

However, EnergyAustralia accepts that the information provided in the June 2008 and January 2009 submissions was not exhaustive in explaining IPART's assumptions for return of capital in approving prices.

EnergyAustralia also accepts this information was provided in support of EnergyAustralia's proposal for a periodic revaluation, rather than supporting a roll forward of the asset base.

In any case, it is clear from the final determination and the Tribunal proceedings that the limited time to consider information from EnergyAustralia was a factor in the AER rejecting EnergyAustralia's preferred opening RAB.

In addition, the AER did not have before it important information from IPART addressing the underlying basis of price increases between 2005-2009.

Further consideration of the AER's opening RAB value

EnergyAustralia submits there is highly persuasive evidence to support a different value for the 2009 opening RAB.

A higher value is warranted and is supported by the Law, Rules and the AER's basis and reasoning for rejecting EnergyAustralia's proposed periodic revaluation of public lighting assets.

The next section provides the necessary evidence which supports our conclusions. In particular, we demonstrate that IPART's approval of prices was directly related to the input assumptions regarding return of capital. These assumptions involved a much smaller return on capital than that which the AER has assumed in arriving at its opening RAB value of $111.3 million.

The relevant evidence we summarise in the next section includes:

[23] AER *Outline of Submissions to the Australian Competition Tribunal, Part C.4 EnergyAustralia Specific Matters,* 11 August 2009, paragraph 17

- EnergyAustralia's original proposal for public lighting prices in 2004;
- IPART correspondence providing reasons for the rejection of these prices in 2 March;
- EnergyAustralia's resubmission of prices based on revised depreciation assumptions in June 2005;
- IPART's acceptance of these prices in August 2005.

We also summarise additional information provided by IPART which provides further justification in favour of revising the opening RAB for 2009.

2.6 Regulatory Asset Base 2004-2009

IPART's rejection of EnergyAustralia's 2004 public lighting proposal

EnergyAustralia's 2004 Public Lighting Pricing Proposal to IPART proposed public lighting price increases EnergyAustralia proposed that there should be a transition to the proposed prices, with an annual revenue cap of CPI plus:

- 29% in the first year;
- 15% in the second year;
- 8% in the third year; and
- 7% in the fourth year

On 2 March 2005, IPART wrote to EnergyAustralia rejecting its November 2004 public lighting pricing proposal. Relevantly, it stated[24]:

> I am writing to inform you that the Tribunal has considered under the Regulation of Excluded Distribution Services Rule 2004/1 EnergyAustralia's November 2004 proposals for an increase in public lighting charges. The Tribunal is not satisfied that EnergyAustralia's Public Lighting price proposals comply with all of the requirements of Clause 2.3. of Rule 2004/1. The Tribunal therefore requires EnergyAustralia to submit alternative prices.

IPART's principle concern with the price application regarded the asset lives proposed by EnergyAustralia in the EnergyAustralia 2004 Public Lighting Pricing Proposal as follows:

> The Tribunal calculates that remaining asset lives consistent with a constant asset base would be in the order of 27 years. This would imply a significantly lower depreciation assumption to the one included in EnergyAustralia's proposals (a figure in the order of $5 million, as opposed to the $9 million assumed by EnergyAustralia)[25].

IPART suggested that EnergyAustralia should further consider depreciation projections in the light of its rejection of the proposal.

In effect, IPART rejected the price increases EnergyAustralia proposed, but suggested it would accept a lower price path based on longer asset life assumptions.

IPART's approval of EnergyAustralia's 2005 proposal

In June 2005, EnergyAustralia submitted its Revised Public Lighting Pricing Proposal to IPART[26].

Responding to IPART's suggestion, EnergyAustralia proposed to extend the remaining life over which it would recover its capital, from 11.2 years as at 30 June 2003 to 16.2 years as at 30 June 2004:

> In order to derive a "reasonable" price path, while maintaining NPV neutrality, the period over which sunk capital is returned would need to be extended beyond the 10 year "average remaining life assumption" as previously adopted. In order to ameliorate pricing-impact concerns, EnergyAustralia has calculated a return of capital component of the

[24] IPART Letter *Review of EnergyAustralia Public Lighting proposals* 2 March 2005, p1

[25] Ibid.

[26] EnergyAustralia, *EnergyAustralia's Submission to Independent Pricing and Regulatory Tribunal: EnergyAustralia's Revised Public Lighting Pricing Proposal*, June 2005

2. Regulatory Asset Base (continued)

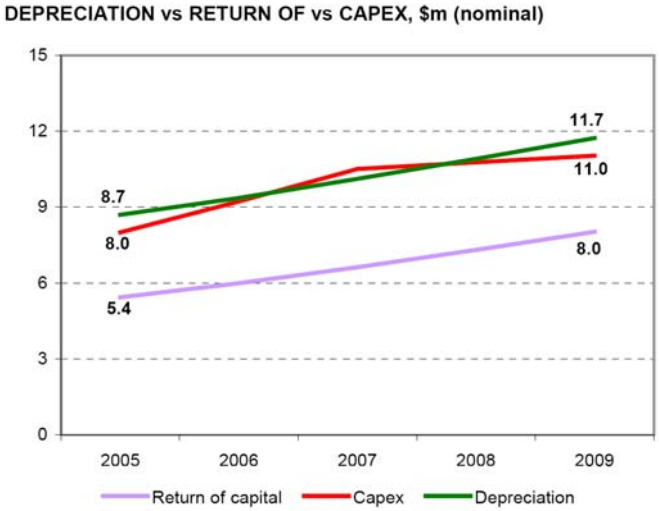
> revenue requirement equivalent to extending the assumed economic remaining life of existing (ie. pre-2004) assets to 16.2 years. While this approach does extend the period over which invested capital is recovered (thereby increasing regulatory risk for EnergyAustralia), it has the effect of delivering a transition path that mitigates the pricing impact in the earlier years, consistent with the Rule, whilst at the same time ensuring NPV neutrality.

In relation to capital expenditure incurred after 30 June 2004, EnergyAustralia's 2005 Revised Public Lighting Pricing Proposal maintained the 20 year standard life assumption made in the EnergyAustralia 2004 Public Lighting Pricing Proposal.

EnergyAustralia anticipated that the revision of the remaining life would result in a higher public lighting RAB value at the end of the 2004-2009 regulatory period because EnergyAustralia would be recovering less depreciation over that period.

Figure 2.1 from EnergyAustralia's 2005 Revised Public Lighting Pricing Proposal (set out below with its accompanying text)[27] demonstrates the difference between EnergyAustralia's proposed allowance for economic depreciation and the expected forecast depreciation and capex over the 2004/2005-2008/2009 regulatory control period.

Figure 2.1 – Relationship between depreciation, return of capital and capital expenditure



As can be observed in Figure 2.1, EnergyAustralia's 2004 pricing proposal did result in a close alignment between capital expenditure (the red line) and "depreciation" (the green line) which would have had the effect of maintaining the RAB in constant terms over time.

IPART's rejection of EnergyAustralia's 2004 pricing proposal required EnergyAustralia to propose a lower price path by revising (downward) its "return of" capital proposal (from the green line to the purple line). A lower return of capital over the period logically results in a higher RAB at the end of the period.

In August 2005, IPART approved EnergyAustralia's 2005 Revised Public Lighting Pricing Proposal[28].

Within the context of its approval, IPART had regard to Excluded Services Rule 2004/01 (Clause 2.3(c)) which stated:

> if the DNSP's prospective price changes would reasonably be expected to impose significant adjustment costs on those that must bear those price changes, the DNSP must implement transitional price options, a phased approach or other measures (whether as part of its prospective price

[27] Ibid, p10

[28] IPART, *Statement of Reasons for Decision*, August 2005

> changes or otherwise) which in the Tribunal's opinion are reasonably necessary to mitigate the effects of those adjustment costs, having regard to the nature and extent of those adjustment costs and the prospective changes.[29]

IPART undertook its own modelling and concluded that the prices proposed by EnergyAustralia were reasonable and consistent with the excluded services rules and therefore approved EnergyAustralia's proposed prices:

> EA had submitted that the initial price increase of CPI+10% would be insufficient to bring revenues up to the same level as efficient costs, but … limited the proposed 2005 price increase … given Tribunal and council concerns about the customer impacts of a larger single year increase. EA's proposals therefore involve ongoing under-recovery relative to costs in the initial years…
>
> The Tribunal's own modelling of revenue requirements and price paths confirmed EA's proposal. It therefore considers it appropriate to accept EA's proposed four year price path.[30]

IPART concluded that EnergyAustralia's prices were equivalent to its own modelling results notwithstanding that IPART had used different input assumptions:

> The Tribunal considered that the appropriate asset base on which EA should be able to earn a return should be equal to the amount that the Tribunal removed from the prescribed services asset base in 2004 – that is, a figure of $97.8m ($2003/04) (adjusted for inflation and subsequent expenditure as deemed prudent by consultants Wilson Cook). This is consistent with the Tribunal's view that a "line in the sand" should be drawn under the asset base (as opposed to repeated revaluations at subsequent reviews), so that the asset base reflects the financial valuation of the business.
>
> This decision is key to understanding why the Tribunal is satisfied that EA's revised application for price increases complies with the Rule 2004/01. The asset base figure assumed by the Tribunal is higher than that assumed by EA in its proposals – this difference serves to offset the impact of the lower opex costs and longer asset life assumptions identified by Wilson Cook. However, in taking this "financial valuation" approach, the Tribunal has indicated that, although it cannot bind a future decision maker, it does not support revaluation of the asset base.[31]

Additional IPART material

On 30 November 2009 EnergyAustralia wrote to IPART seeking further material (if any) which may have supported its approval of prices in 2005:

> I am seeking a copy of the model or any other relevant information supporting the assumptions underlying IPART's August 2005 decision on public lighting. This information will be used to inform our submission to the AER on the appropriate methodology for determining the regulatory asset base and its value for use in the AER's building block approach for public lighting assets constructed before 1July 2009. We consider the information will also assist the AER in assessing our submission on this matter. [32]

On 10 December 2009 IPART responded to EnergyAustralia's request[33], providing a spreadsheet which was used by IPART to assess whether to approve EnergyAustralia's price application[34]. IPART's accompanying letter noted the following:

[29] Ibid p2
[30] Ibid p3
[31] Ibid p3
[32] EnergyAustralia letter to IPART: *Request for modelling assumptions underlying IPART's 2005 decision on public lighting*, 30 November 2009, p1
[33] IPART letter- to EnergyAustralia, *IPART's decision on public lighting*, 10 December 2009
[34] IPART Spreadsheet, *IPART Street lighting model EA Scenarios for 24 August TB 7 pc WACC,* 23 August 2005

- IPART was not required to determine building block assumptions;
- IPART did consider the appropriate asset base should be the amount removed from EnergyAustralia's prescribed RAB in 2004 (that is, $97.8 million);
- IPART had regard to a range of input assumptions in determining whether it approved prices and these input assumptions were set out in the assumptions in the attached spreadsheet;
- IPART also accepted Wilson Cook's conclusions regarding opex and the extension of asset lives (for bracket arms and steel standards).

IPART's spreadsheet contained 9 scenarios which were used to test different input assumptions against EnergyAustralia's proposal. This included changes to opex, WACC and different options for smoothing.

Of significance was that under all 9 scenarios tested IPART maintained a remaining life of 16.2 years for calculating return of capital.

2.7 Other relevant supporting evidence

In addition to noting the "new material" that EnergyAustralia provided in its April submission, the AER provided the following reasons why it chose not to accept a higher RAB:

> the depreciation noted in the Wilson Cook report appears to suggest that there had been a front loading of depreciation over the period 1998/99-2003/04. [35]

The report relied upon by EnergyAustralia, by the Allen Consulting Group, did not comprise an analysis of actual depreciation that had occurred within EnergyAustralia's business.

2005 Wilson Cook review

On 16 August 2005, Wilson Cook issued a review of EnergyAustralia's public lighting capital and operating expenditure to IPART[36].

In respect of the AER's arguments that the Wilson Cook report demonstrated a front loading of depreciation in an earlier period, EnergyAustralia submits that:

- On the evidence, the Wilson Cook does not necessarily demonstrate a front end loading of depreciation in an earlier period, rather a disconnect between the depreciation of the asset base and the amount of capex over that period.
- The level of capex and depreciation pre-1 July 2004, has no material bearing upon the 1 July 2004 public lighting RAB. The 1 July 2004 public lighting RAB represented IPART's best estimate of EnergyAustralia's public lighting asset value and was the amount removed from EnergyAustralia's prescribed services RAB to set the "line in the sand" for financial roll forward of the asset base from that time on.

Wilson Cook's report supports the proposition that the depreciation schedule used by the AER to roll forward the public lighting RAB is substantially higher than that implied by the EnergyAustralia's public lighting revenues. This is highlighted in the analysis of 2004/05 revenues (i.e., when capex has minimal or no impact on revenues).

Allens Consulting Group

The AER did not consider the 2003 Allens Consulting Group report on the basis that it made no reference to EnergyAustralia's actual depreciation that occurred in EnergyAustralia's business[37].

However, the ACG report has relevance to the extent that it addresses issues associated with "…the derivation of

[35] AER Final Decision, pages 371-372

[36] Wilson Cook and Co, *Review of EnergyAustralia's Public Lighting Capital Expenditure and Operating Expenditure*, August 2005

[37] AER Final Decision, p371

regulatory depreciation allowances for the next regulatory period for the NSW electricity distributors (that s, future depreciation), and on the value that is taken as regulatory depreciation for the previous regulatory period"[38].

In its report to IPART, of September 2003, Allen Consulting Group concluded:

> With respect to the updating of the regulatory asset bases for regulatory depreciation over the previous regulatory control period, the most important principle is consistency with the assumptions reflected in the price controls for the previous regulatory period, with the other relevant objectives being simplicity and efficiency.
>
> There is no rationale to countenance any reopening of the effective lives or depreciation method that was used to determine regulated charges for the previous regulatory period.[39]

Importantly, ACG's report explores the notion of financial capital maintenance (as opposed to physical capital maintenance) and makes the following observations[40]:

- The universal regulatory approach for energy distribution in Australia is to set regulated charges using an accounting convention that mimics financial capital maintenance.
- under financial capital maintenance – the value of the investment is independent of the value individual physical assets. For regulation, this implies that the aggregate value of the regulatory asset base and the aggregate level of regulatory depreciation are the relevant parameters, rather than values attributed to individual assets.
- regulatory depreciation is the return of funds that the regulated entity has invested previously, and so future replacement expenditure needs are irrelevant to the determination of regulatory depreciation.
- under financial capital maintenance replacement expenditure recovered through the return on and return of that investment *after* the replacement investment has been made.

Finally, the ACG report is relevant in that it acknowledges the implications of changing the allowed depreciation profile (by extending asset lives)[41]:

> A further consequence of changing to a more deferred depreciation method part way through the life of the existing assets would imply that prices would be lower for a period, and then rise – possibly by a substantial amount – as the deferred depreciation is recovered. The precise impact of a deferral of depreciation depends upon the average age and composition of existing assets, but is reasonably straightforward to model for a particular utility, given knowledge about existing assets and future capital expenditure requirements.

2.8 Recommended approach to establishing RAB value as at 1 July 2009

NERA report

EnergyAustralia engaged NERA Economic Consulting to review the economic theory and principles surrounding the roll forward of the asset base between regulatory periods. NERA was also asked to roll forward the public lighting asset base, based on:

- information used by IPART in approving prices in 2005; and
- the principles of financial capital maintenance which essentially ensure that businesses do not make material windfall gains and losses to value from the initial investment.

NERA's report provides the following conclusions:

[38] Allen Consulting Group *Principles for Determining Regulatory depreciation allowance,* September 2003 p1
[39] Ibid p2
[40] Ibid p16
[41] Ibid p23

- regulators typically adopt one of two approaches to setting the regulatory asset base;
- financial roll forward of the asset base to ensure financial capital maintenance is not a discrete concept limited to Chapter 6 the Rules but is a common and preferred approach amongst regulators (including the AER) to determining the RAB for long lived energy sector assets;
- applying an amount of depreciation which reflects the same approach and methodologies of the previous regulatory decision is universally adopted by regulators;
- using IPART's revenue model which underpinned its 2005 determination on public lighting, NERA estimated an appropriate opening RAB for 1 July 2009 as $142.4 million, noting that this figure is conservative; and
- the AER's previously determined RAB of $111.3 is not appropriate as it imposes a substantial windfall loss on EnergyAustralia, and is inconsistent both with the principle of financial capital maintenance and with general regulatory practice in the energy sector in Australia.

Proposed RAB value

EnergyAustralia has proposed several alternative opening RAB values that would be reasonably consistent with financial capital maintenance assumptions.

However, with the information provided by IPART, EnergyAustralia recommends adopting NERA's methodology of calculating the RAB using IPART's approach as this methodology would be appropriate in the circumstances.

EnergyAustralia therefore recommends the AER adopt an opening RAB value of $142.4 million consistent with NERA's analysis and conclusions.

At the request of EnergyAustralia, NERA also calculated the 1 July 2009 RAB on the basis of the AER's preferred roll-forward model, updated to ensure consistency with the substantially longer asset life assumptions adopted by IPART and to remove the lagged indexation of the RAB. Under this approach the value of the RAB as at 1 July 2009 is estimated at $139.1 million.

EnergyAustralia agrees with NERA that the value of $111.3 that the AER previously determined is not appropriate as it imposes a substantial windfall loss on EnergyAustralia. Maintaining this value would be inconsistent with:

- the principle of financial capital maintenance;
- general regulatory practice in the energy sector in Australia;
- the Revenue and Pricing Principles in the Law;
- Clause 6.5.2(d) of the Rules;
- the AER's own reasoning in its final determination.

These last three points are outlined in the next section.

2.9 Consistency with Rules, Law and AER reasoning

Consistency with NEL

Section 7A(2)(b) of the NEL provides that a regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in complying with a regulatory obligation or requirement or making a regulatory payment.

Section 7A(4) of the NEL relevantly provides:

> Regard should be had to the regulatory asset base with respect to a distribution system adopted:
>
> (a) in any previous:
>
> (i) …distribution determination; or
>
> (ii) determination or decision under the National Electricity Code or jurisdictional electricity legislation regulating the revenue earned, or prices charged, by a person providing services by means of that distribution system…

In determining the opening RAB by applying a roll forward approach, standard regulatory practice requires a regulator to base the depreciation amount on the same rates and

methodologies that were used to calculate the depreciation component of the revenue requirement for the previous regulatory period.

Consistency with NER

This principle is reflected in clause 6.2.5(d)(3) of the Rules[42], requiring the AER, in deciding upon a control mechanism for alternative control services, to have regard to the regulatory arrangements applicable to the relevant service immediately before the commencement of the distribution determination.

Consistency with AER reasoning in its final determination

Similarly, in the Final Determination, the AER observes, in a related context:

> The AER considers that when a change in the asset valuation approach and/or price setting methodology occurs part way through the life of a regulated asset, and the age and value of the assets are not treated consistently, then a consequence can be excess or deficient returns, or the assessment of such returns could be obscured.[43]

The AER states:

> For reasons of regulatory certainty the AER does not consider that it is appropriate to reverse a decision that has already been accepted and implemented by the previous regulator and for that reason accepts an asset life of 20 years for brackets installed prior to 30 June 2009.[44]

Consistency with AER's statement on the control mechanism for alternative control services

In its Final Decision: Control Mechanism for Alternative Control Services for the ACT and NSW 2009 Distribution Determinations, February 2008, (at pages 14-15), the AER stated:

> Proposed asset valuation
>
> …
>
> The AER considered that the historical RAB values would simplify the building block analysis and avoid the need to develop a bottom–up valuation where there are a large number of low value assets.
>
> This position was based on the AER's understanding that IPART scrutinized and set down the regulatory values at the last regulatory control period.
>
> Through submissions and subsequent consultation with IPART, the AER has become aware that an asset valuation was not formally established for public lighting assets. However, IPART advised that at the last reset, public lighting was moved from a prescribed service to an excluded service. As part of this shift a value was deducted from the RAB corresponding to prescribed services. IPART has advised that an asset valuation for public lighting asset could be derived by taking the closing RAB at the end of the 1999-2004 regulatory control period and subtracting the opening RAB from the 2004-2009 period. The difference will provide the asset valuation for public lighting assets.
>
> This advice supports EnergyAustralia's submission that it can provide the AER with an understanding of the asset value on which services were provided as at 1 July 2004 and the changes between that asset value and the asset value that should apply at 1 July 2009.[45]

EnergyAustralia submits that its proposed opening value of $142 million is consistent with the Rules, Law and the AER's reasoning for rejecting our proposed periodic revaluation of assets (set out in the AER's determination).

[42] In both Chapter 6 and Transitional Rules
[43] AER Final Decision, page 365
[44] AER Final Decision, page 386

[45] AER, *Final Decision: Control Mechanism for Alternative Control Services for the ACT and NSW 2009 Distribution Determinations*, February 2008, pages 14-15.

2. Regulatory Asset Base (continued)

Similarly EnergyAustralia submits that the AER's determined value of $111.3 is not an appropriate value as it is not consistent with the requirements of the Rules or the Law, as well as the reasons set out in the AER decision.

3. Operating expenditure

EnergyAustralia's submission on operating expenditure is directed at satisfying the directions of the Tribunal.

The submission sets out what EnergyAustralia considers is the efficient operating expenditure allowance that should apply to EnergyAustralia's public lighting business:

- Section 1 outlines the evidence previously provided to support the efficiency of EnergyAustralia's outturn operating expenditure and the reasonableness of the approach to use this total operating expenditure allowance to allocate costs *down* to cost components for pricing purposes.
- Section 2 summarises our understanding of the AER's concerns with our approach, noting the basis of the concerns stem from how the AER used EnergyAustralia's 2008 model and that the AER's use of the model was at cross purposes to EnergyAustralia's purpose and use of the model.
- Sections 3 and 4 addresses the AER and Tribunal concerns by demonstrating how our 2009 opex model seeks to justify operating expenditure at the cost component level. The section outlines our assumptions and the basis for them.
- Section 5 compares some of the assumptions EnergyAustralia uses against AER and other business assumptions
- Section 6 outlines additional support EnergyAustralia received from PB consulting and PWC in developing its forecasts.

3.1 Basis of EnergyAustralia's submission

EnergyAustralia's submission regarding operating expenditure for public lighting services has been prepared to both satisfy the directions of the Tribunal and to put all relevant and appropriate matters to the AER for its consideration when re-making its decision with respect to public lighting. The submission:

- describes the methodology for determining efficient operating expenditure required by EnergyAustralia for each year of the regulatory control period in order to operate and maintain public lighting assets and sets out the value.
- supports EnergyAustralia's proposed efficient operating expenditure by explaining and justifying the efficiency of inputs and assumptions for all key maintenance aspects used in EnergyAustralia's detailed bottom up model.

Element of decision that EnergyAustralia is seeking to vary

EnergyAustralia proposed an annual operating expenditure of $15.83 million ($2008-09) for each year of the 2009-14 regulatory period. As part of its final decision, the AER rejected EnergyAustralia's proposed operating expenditure, and substituted an alternative annual amount of $13.2 million.

EnergyAustralia is seeking to vary the AER's decision and substitute a new value of $16.28 million based on a component build up of input assumptions. These assumptions are explained in this chapter.

Tribunal's directions

The Tribunal directed that EnergyAustralia's submission to the AER must address the value of, and methodology for determining, the efficient operating expenditure required by EnergyAustralia for each year of the regulatory control period in order to operate and maintain its public lighting assets that provide alternative control services.

The Tribunal noted that the efficient level of operating expenditure must be supported by a detailed model, whereby the efficiency of inputs and assumptions for all key maintenance aspects are explained and justified. It noted that the submission may include information and material that was not before the AER when it made its original decision.

The Tribunal directed that, to the extent that they remain relevant, in making the decision again, the AER must correct those parts of its final determination that the AER has conceded are in error.

Relevantly, in terms of efficient operating expenditure, this involves:

- Indexation of operating expenditure by forecast inflation (pre July 2009 assets) – the AER is to apply forecast inflation, in addition to the real wage inflator,

in respect of the annual efficient operating expenditure for pre 1 July public lighting assets when calculating the future nominal charges for those assets.

- Additional labour costs for traffic routes – An allowance be made for efficient labour costs for traffic routes.
- Connections operating costs – An allowance be made for efficient opex on pre July 2009 connections operating expenditure.

Tribunal's considerations

The Tribunal noted that EnergyAustralia had proposed what is called a top-down approach, which was based on a proposed annual amount of opex on the year-to-date spend in 2007-08. It noted that the AER did not accept the proposal on the basis that this amount would recover more than EnergyAustralia's efficient cost.

In the Tribunal's view the AER was and is entitled to question whether the 2007-08 year-to- date spend represented efficient costs. The Tribunal was satisfied that the AER's exercise of discretion was incorrect in its consideration of the underlying assumptions in the EnergyAustralia proposal and its explanation for its decision.

The Tribunal was not satisfied, on the material before it, that the EnergyAustralia proposal should necessarily be adopted. For this reason it considered that the matter of the efficient operating expenditure required by EnergyAustralia should be a matter for re-determination by the AER upon remittal.

3.2 Evidence supporting the efficiency of EnergyAustralia's actual operating expenditure

EnergyAustralia's approach to forecasting opex

In our June 2008 regulatory proposal, EnergyAustralia proposed an annual operating expenditure for each year of the 2009-14 regulatory period. This value was based on the year to date actual costs of operating and maintaining public lighting assets that provide alternative control services, and escalating these costs for real labour and CPI. In our April 2009 submission to the AER, we updated this value for actual costs in 2007-08 (as opposed to year to date) and for updated real labour cost escalation and CPI.

The model was not intended to demonstrate the efficiency of EnergyAustralia's 2007-08 costs. Rather it was seeking to identify the major drivers of maintaining different public lighting components to establish a price.

Relevantly, the model did not capture the full suite of costs incurred by EnergyAustralia in operating and maintaining public lights. For example, EnergyAustralia's model did not identify the costs involved in operating an elevated work platform. Further, certain inputs in the model, for instance failure rates, were used to 'solve' for 2007-08 actual costs.

Financial systems record of public lighting information

The following section describes EnergyAustralia's current financial systems used for accounting purposes in respect of public lighting.

EnergyAustralia's financial systems use various cost collection objects to capture operating expenditure incurred in undertaking specific work activities or expenditure incurred in performing certain functions that are undertaken in the provision of one or more services. The operating expenditure incurred includes all different types of costs such as labour, materials, contracted services, IT etc.

The allocation of these costs to the various services is performed in accordance with the cost allocation method approved by the AER.

The cost allocation method stipulates that:

- direct costs are to be wholly attributed to a service;
- shared costs are allocated to two or more services on a causal basis where possible; and
- if a causal basis cannot be established to allocate a shared cost without undue costs and effort, these costs can be allocated via a non-causal but defensible basis.

Essentially, costs incurred for specific work activities are direct costs and are directly allocated to the services provided. For example, maintenance costs on network system assets

(except for public lighting assets) are directly attributed to standard control services.

Costs incurred in performing company wide functions (e.g. internal audit) are predominantly shared costs and allocated between the different services using the approved cost allocation method.

With respect to the provision of alternative control services, EnergyAustralia has included as part of this submission a document which disaggregates the total operating expenditure of $15.9m incurred for the FY 2008/09[46]. The total operating expenditure comprises of direct and shared costs. Direct maintenance costs of street lighting assets are disaggregated into four categories which are:

1. Inspection
2. Corrective
3. Breakdown
4. Nature induced break down.

EnergyAustralia also incurs other direct operating expenditure in the provision of alternative control services. This expenditure relates to:

- data management including data entry, scheduling, reporting of public lighting statistics;
- preparation and management of public lighting policies, regulatory management, billing and interaction with customers (councils); and
- Inventory management and reporting.

Shared costs pertaining to alternative control services represent the portion of the total costs incurred by EnergyAustralia in undertaking company wide functions. These shared costs are allocated to the various services using the allocators approved by the AER.

While such information is useful for financial reporting and consolidation purposes, the financial system data is at an insufficient level of detail to provide cost build up information. Nevertheless, EnergyAustralia used these inputs to make assumptions regarding forecast operating expenditure in its June 2008 proposal.

EnergyAustralia's 2008 public lighting model

The following section summarises the models used by EnergyAustralia and the AER in determining opex as part of the AER's final determination.

EnergyAustralia's 2008 public lighting model took the public lighting operating expenditure "line item" and sought to allocate this in a way that resembled reasonable cost reflectivity to customers.

This represented more of a rule of thumb general allocation to high level cost categories such as bulk and spot replacements.

For example miscellaneous cost items were evenly allocated to all EnergyAustralia's lamps and connections assets.

If any comparison was to be undertaken, these other costs would need to be separated out to ensure a consistent comparison.

EnergyAustralia's 2008 model was therefore never intended to demonstrate the efficiency of forecast operating expenditure at the build up component level. Rather it assumed the efficiency of the input total operating expenditure and sought to fully allocate these costs to relevant components of public lighting in a reasonably cost reflective manner.

Consistency with other approaches

EnergyAustralia's proposed forecast of public lighting operating expenditure was made on the basis that its base year 2007- 08 actual operating expenditure represented the efficient costs of operating and maintaining public lights.

EnergyAustralia's 2008 public lighting model allocated total operating costs by first allocating the cost of the bulk lamp replacement program to each lamp. The model then allocated the remaining operating costs, which it attributed to spot replacement.

Other areas of commonality between alternative control service and standard control service assumptions

[46] EnergyAustralia *Operating expenditure for the provision of alternative control service – FY 2009*, January 2010.

3. Operating expenditure (continued)

EnergyAustralia also used common techniques to establish optimum maintenance and asset replacement cycles including FMECA and RCM. These techniques were accepted by the AER and its consultant Wilson Cook & Co, as being representative of good business practice.

SAHA, in its report in relation to EnergyAustralia's standard control services remarked that EnergyAustralia's asset management practices were in line with best practice that produces efficient maintenance costs over time[47].

AER consultant's expert opinion

The AER engaged Wilson Cook to review the operating expenditure proposal for public lighting. Wilson Cook's report in respect of public lighting stated the following:

> We also understood from our discussion with EnergyAustralia that the opex programme foreseen in 2005 was continuing but the savings foreseen by us are not evident. We noted, however, that the 2005 review specifically excluded any costs of compliance with the then draft public lighting code but accept that costs would be incurred on its introduction. The code has since been promulgated.
>
> We did not discuss public lighting expenditure further with EnergyAustralia, given its lack of materiality in terms of the total expenditure reviewed, but if the AER continues a building block approach for public lighting, we recommend that the proposed capex be accepted, but that in the absence of a case for change from EnergyAustralia, public lighting opex ought to be maintained at its level in FY 2008 in real terms..[48]

3.3 AER concerns

In its final determination, the AER sought to address issues in respect of maintenance charges.

The AER considered that there were four key components influencing how the maintenance charge is calculated[49]:

1. the length of the cycle between lamp replacements.
2. the number of lamps that can be replaced per day under a bulk lamp replacement regime.
3. the expected spot (intermittent) lamp failures between bulk lamp replacements and the relationship between the length of a bulk lamp replacement cycle and the number of spot lamp failures.
4. the number of spot lamp replacements that can be completed per day.

When seeking to verify the efficiency of the operating expenditure proposed by EnergyAustralia, the AER reviewed EnergyAustralia's component level costs in the top down model and compared these against input assumptions of other DNSPs and by undertaking its own analysis.

Based on the review of component or build up costs, the AER formed an opinion that EnergyAustralia's proposed operating expenditure was above the efficient cost of operating and maintaining public lights.

The AER's expectation of cost build up assumptions

The AER's expectation was that EnergyAustralia's model reflected the full suite of cost assumptions of operating and maintaining public lights, and that the inputs were a 'build up' of efficient cost component assumptions to establish the efficient total operating costs.

While EnergyAustralia's model did include cost assumptions for certain drivers for the purposes of allocating an efficient level of total operating expenditure, the model was never intended to demonstrate the efficiency of each cost component.

[47] SAHA International *Electricity Distribution Business Operational Expenditure Review,* 4 April 2008

[48] Wilson Cook and Co "*Review of Proposed Expenditure of ACT and NSW DNSPs - Volume 2 EnergyAustralia*", p63

[49] AER Final Decision, p341

In reviewing EnergyAustralia's application for review, the Tribunal considered that the AER was entitled to question whether the 2007-08 actual costs represented efficient costs. Accordingly, the Tribunal directed EnergyAustralia to develop a detailed model which captures all key maintenance aspects, and which explains and justifies the efficiency of inputs and assumptions.

EnergyAustralia's approach to addressing these concerns

One of the purposes of this submission is justify the efficient level of operating expenditure EnergyAustralia incurs and is likely to incur during the regulatory control period.

EnergyAustralia aims to achieve this by:

- providing assumptions on key cost components which drive operating expenditure;
- where available, providing evidence demonstrating the basis of each cost component assumption;
- where necessary, comparing EnergyAustralia's cost component assumption with assumptions made by the AER, other regulators and other NSPs;
- including these cost assumptions in a detailed cost build up model that determines the operating expenditure requirement for EnergyAustralia based on cost component input assumptions;
- comparing the total operating expenditure requirement to actual operating expenditure incurred to determined relative levels of efficient costs.

Our submission also includes additional analysis and expert opinion to assist us in addressing the AER's concerns and to support our conclusions. This includes:

- engaging PB consulting to review our operating expenditure requirements for efficiency, having regard to previous regulatory decisions and other DNSPs;
- updating and revising EnergyAustralia's Network Maintenance Standards, street lighting analysis report, following the AER's dismissal of the 2004 report on the basis that it was outdated and did not factor in important changes to EnergyAustralia's public lighting operations[50];
- engaging PWC to ensure the integrity of the public lighting opex model EnergyAustralia has developed.

3.4 Methodology and value for determining efficient operating expenditure

Explanation of EnergyAustralia's cost build up model

EnergyAustralia's detailed model for determining efficient operating expenditure is diagrammatically presented below.

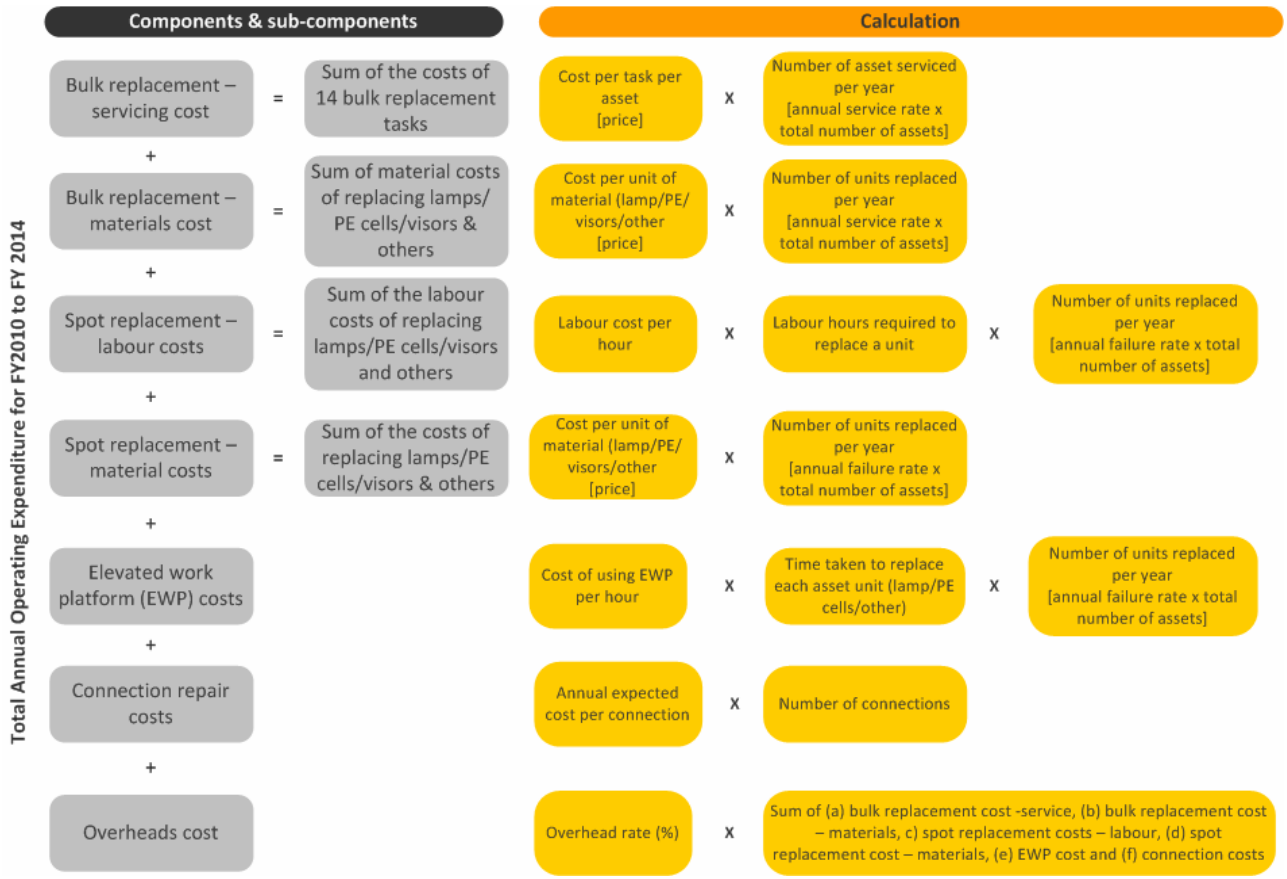
The model will calculate an opex charge for each type of public light based on the characteristics of different light types. This annual maintenance cost is represented as a price payable for each lamp type. However, a maintenance cost effectively applies to all components of the public light, not just the lamp. The exception is the cost of maintaining the connection component of the public light, which is calculated separately as a charge per connection for underground connections only.

The maintenance charge for lamps and connections is applied to the total number of lights of each type to forecast the total opex amount.

[50] AER final determination, p344

3. Operating expenditure (continued)

Operating and maintenance cost build up model



3.5 Efficiency of inputs and assumptions underlying EnergyAustralia's model

Bulk maintenance assumptions

EnergyAustralia maintains its public lighting assets under a bulk maintenance regime, which covers most of the public lights maintained by EnergyAustralia.

Most of the maintenance covered by EnergyAustralia's bulk maintenance regime is sourced by competitive tender.

The bulk maintenance contracts include the provision of the maintenance service, with EnergyAustralia being responsible for the procurement and provision of materials to the contractor.

Outsourcing of bulk maintenance began in 2006 and its coverage has recently been increased to include the Newcastle region.

Only the Upper Hunter region is currently not covered by a bulk maintenance regime (representing approximately 1.8% of the population).

The model uses the structure of the competitively tendered bulk maintenance contracts as the basis of the forecast. EnergyAustralia's assumptions are based on the following information sourced from the bulk maintenance contract:

- the tasks carried out under the contract;
- the associated unit rate per task;
- the replacement cycles assumed in the contract; and
- the number of lights being maintained.

Bulk maintenance cycles

EnergyAustralia determines an optimised bulk lamp replacement cycle by using failure and cost data across a range of periods. The annualised bulk lamp replacement costs, combined with the cumulative spot lamp replacement cost is plotted to determine the optimum cycle point (the lowest point on the summated curve). This is discussed further below.

The assumed quantities of tasks are directly sourced from the number of tasks that have been carried out under the bulk maintenance regime from November 2008 to November 2009 for the Central Coast, North, South and East regions, which had approximately 200,000 lights as at June 2009. The table also shows the number of years that would be required for each maintenance task to be carried out on each of the 200,000 lights. The calculation of this cycle assumes the work would be carried out at the same rate as November 2008 to November 2009.

Contracted bulk maintenance tasks	Quantity of tasks (Nov 08 to Nov 09)
Number of lights	203,573
Servicing of luminaires (major and minor)	72,258
Replacement of luminaire visors (major and minor)	5,166
Replacement of photo-electric Cell	43,552
Minor non-electrical repair	314
General electrical work	6,890
Minor electrical work	1,530
Major electrical work	3,596
Electrical work previously completed by EnergyAustralia	461
Quarterly night time Traffic Route Luminaire (TRL) patrol*	5
Annual night time patrol of all serviced luminaires	45
Ad hoc works order	647
Ad hoc patrolling and reporting of defects	-

* EnergyAustralia staff undertake these patrols in the Central Coast, North and Upper Hunter regions, and contract staff in all other regions.

The rates offered by the contractors (commencing on 1 November 2008) are applicable for 30 months without increase. After 30 months the contracts will be renegotiated and new prices will apply. The modelling assumes that the prices will increase by CPI in 2012-13 and 2013-14.

Assessment of cycles using updated asset management analysis

EnergyAustralia updated its analysis of optimum bulk lamp replacement cycles to reflect current inventories and circumstances. This is in response to the AER's decision not

3. Operating expenditure (continued)

to consider the 2004 report on the basis of its age[51], although EnergyAustralia maintains the relevance of the 2004 given it covers the vast majority of EnergyAustralia's currently deployed lamp types.

EnergyAustralia's Streetlighting Maintenance Requirements Analysis Report[52] looked at 453,094 records across 41 lamp types for the data period 1 January 2006 to 30 June 2009.

From the 41 lamp types utilised for the analysis, sufficient failure records existed for 24 lamp types to be able to determine statistical parameters for the Weibull distribution that most closely matched the data sets.

The lamp failure and replacement data records were used to determine optimum periods for bulk relamping based upon balancing the equivalent annual cost of bulk relamping against the spot replacement costs.

Divergence in results based on data

EnergyAustralia notes that failure rates for some lamps are well below what was previously assumed at the time of EnergyAustralia's proposal.

The analysis of our population also demonstrates that some lamp types are subject to infant mortality and clear wear out characteristics are not seen within the time frame in which data is available (as bulk replacement has occurred prior to any expected up-turn in failure rates). This would infer that for some lamp types a bulk lamp replacement period of more than 3 years may be technically feasible.

For other lamp types there is evidence of early wear-out followed by random failure between 2 and 4 years before hazard rates increase again. For example, our most common lamp, MBF 1X80 exhibits the following average annual failure rate based on different bulk lamp replacement cycles.

BLR Cycle	2yr	3yr	3.5yr	4yr
Spot failures (% p.a.)	2.77%	2.43%	2.29%	2.30%

For other lamps the data infers that bulk lamp replacement should extend beyond 3 years, or that bulk replacement program could be abandoned with no impact on service levels.

Our analysis was surprising. Failure rates for many lamps have reduced significantly, some well below rates determined by the AER in April 2009. EnergyAustralia has not had sufficient time to interrogate this analysis and with more time we would prefer to interrogate the data further. We cannot safely justify these spot failure rates as an efficient assumption. Possible explanations for the results of the analysis change include:

- Preliminary analysis suggests many lamp replacements have not been recorded.
- failure rates are not uniformly distributed between each year. Averaging early failure rates over a longer period tends to distort this failure characteristic;
- EnergyAustralia notes that its recorded failure data reveals some early life failures of lamps younger than 30 months. Our statistical analysis is based on the service life we are experiencing and a statistical distribution fitted to this;
- some lamp types have a rapid failure "knee-point" where failures accelerate. It is important that replacements happen before rapid failure so as to avoid unsustainable failures. However these knee-points may not be properly reflected in the underlying data where bulk relamping is influencing the statistical distributions by removing the later life failures;
- our population consists of 41 different lamp types, each with differing distributions of failure rates. EnergyAustralia's optimal bulk lamp replacement cycle needs to incorporate all 41 lamp types across our network. In particular, while some lamp types may indicate longer bulk lamp replacement cycles, other lamp types may exhibit unsustainable failure modes based on a longer cycle; and
- EnergyAustralia has not had the opportunity to interrogate the data fully to ensure consistency of outcomes.

[51] AER Final Decision, page 344
[52] EnergyAustralia *Street Lighting Maintenance Requirements Analysis Review,* December 2009

Faced with some anomalous results in relation to spot failures, EnergyAustralia proposes a bulk lamp maintenance cycle of 3 years for all lamps, for the following reasons:

- In reality, it is impossible to replace lamps at exactly 30 month intervals and as noted above EnergyAustralia's contractors must replace lamps at least every 36 months.
- A 3 year cycle is comparable to industry peers.
- We note concerns with our data and the risk of extending the cycle for assets which cannot sustain a longer cycle without unsustainable failure rates.

We have therefore maintained our assumption of a 3 year cycle despite evidence suggesting some lamp types may have a different optimal cycle, noting the issues raised above and the fact that moving to a 3 year period is generally consistent with industry peers.

We further discuss our analysis of spot failure rates in the next section

Conservatism of assumptions

EnergyAustralia has not assumed any increase in per unit rates for bulk maintenance as a result of moving from 2.5 to 3 years. This is despite evidence suggesting annual fixed costs would invariably increase the per unit rate if moving to a 3 year cycle.

Different lamp replacement cycles are likely to derive different unit rates due to the contractor having some fixed costs. That is, under a 36 month cycle the contractor would have less work per year but with the same fixed costs in each year.

This is demonstrated by looking at the prices offered by a single contractor, who won the bulk maintenance contracts in two different sized regions.

A single contractor won the contracts in the East and South regions of EnergyAustralia's network. The East region is smaller and therefore requires less maintenance tasks per year than the South region. The unit rates offered by the contractor for these two regions also differ. The smaller region, with 30% less maintenance tasks per year, offered a 5% higher unit price per task.

Therefore, under a longer bulk maintenance cycle, the contractors would perform less maintenance tasks per year which would in turn require a higher price per unit cost.

On this basis EnergyAustralia submits that its rates for a 3 year bulk maintenance cycle are therefore conservative.

Calculation of materials

EnergyAustralia procures all materials, so the cost of materials has been calculated separately in the model. The cost of materials has been calculated in four main categories (Lamps, Visors, PE Cells and Miscellaneous) as they relate to the bulk maintenance tasks.

The annual operating expenditure requirement (for each public light type) for each of the four types of materials costs are calculated by the following:

$$\textit{Annual operating expenditure} = \textit{Materials price} \times \frac{1}{cycle} \times \textit{Lamp count}$$

* In the case of lamps, where more than one lamp is part of a luminaire, all lamps are replaced in the lamp replacement task and therefore the lamp price is multiplied by the number of lamps.

EnergyAustralia has not amended the assumptions for lamp prices which have been accepted by the AER.

In its March 2009 supplementary draft decision, the AER noted that it sought copies of invoices relating to the supply of luminaires from each of the DNSPs. The AER was satisfied the materials cost assumptions were generally consistent with the invoices of the costs paid by the NSW DNSPs[53].

Spot maintenance assumptions

Spot failures of lamps and other components of public lights still occur under a bulk maintenance regime.

Whilst an effective bulk replacement regime will reduce the numbers of failures which occur between replacement cycles, spot maintenance is still required to fix failures that occur between bulk replacement periods.

[53] AER, *Supplementary Draft Decision*, p39

3. Operating expenditure (continued)

Modelling basis

The model calculates the cost of labour, vehicles and materials that will be required to maintain public lights, replace lamps and other components as they fail.

EnergyAustralia has annualised the spot failure rates of a 3 year cycle and has incorporated this assumption in its model. This is discussed further below.

Non-lamp replacement tasks

EnergyAustralia also undertakes maintenance tasks, in addition to lamp replacement, based on the spot failure of public lights and their components. These other maintenance tasks require labour, fleet and materials to repair. The cost build up model also calculates these costs. These other tasks have been categorised into PE Cell failure and miscellaneous spot repairs.

Labour Assumptions

The annual operating expenditure requirement for each lamp is the expected cost of the labour for spot maintenance tasks calculated as follows:

Annual operating expenditure = Labour rate x hours required for repairs x lamp failure rate

EnergyAustralia has calculated the hourly labour rate consistent with the approach used to cost customer specific services in accordance with Excluded Services Rule 2004/01[54]. This formula is intended to cover related labour on-costs and direct labour overheads for customer specific services that relate to public lighting.

EnergyAustralia also uses this rate for services which are effectively contestable (capable of being undertaken by another service provider)[55].

Using the formula contained in our information disclosure, EnergyAustralia's proposed labour rate is $100.80 in FY10.

EnergyAustralia has assumed 20% of work is undertaken in overtime hours reflecting the fact that the more complicated work or work on traffic routes require greater access and are usually undertaken outside core business hours[56].

In particular work on Sydney's traffic routes require RTA permits and must be completed in the windows offered by the RTA (which inevitably are in overtime hours).

Time required for average spot lamp replacement

EnergyAustralia's assumptions regarding average spot lamp replacement reflect the particular circumstances of EnergyAustralia's business and an analysis of the type of tasks undertaken by EnergyAustralia.

EnergyAustralia assumes that a spot maintenance task on a non-traffic route requires 2 staff. EnergyAustralia has assumed on average one additional staff member is required for traffic routes, reflecting

- whenever traffic control is required, it requires 2 staff to undertake traffic control;
- however, where the spot maintenance task is routine and access to the light is safe and available without disrupting traffic, the maintenance task will be undertaken with a 2 person crew.

This is a conservative assumption as access to major roads (with clearways etc) means that, in most circumstances, traffic control will be required.

[54] Under Transitional Rule 6.2.3B(c) EnergyAustralia is required to comply substantially with Excluded Services Rule 2004/1 (Regulation of Excluded Distribution Services). A copy of the Rule and the information disclosure showing the methodology for calculating labour rates for customer specific services are attached for information

[55] EnergyAustralia has attached information regarding a quote for works for a public lighting customer which outlines the assumed labour rate.

[56] EnergyAustralia has sourced historical splits between overtime and normal time for dedicated public lighting staff. Excluding on-costs, overtime represented 24% of direct labour costs in 2008-09.

EnergyAustralia's assumptions on the total time to undertake spot maintenance tasks is based on three major categories:

- travel time;
- job preparation time;
- repair time

Travel time is dependant on the time of day travelling, the distance between jobs and the traffic conditions at the time of travel.

Sydney's CBD and surrounding suburbs are notorious for traffic congestion[57]. Even the smallest of journeys can take a reasonable amount of time. In addition, many of the routes will require significant distances. EnergyAustralia's operations in the North (out of Gore Hill) undertake spot replacements as far as:

- Palm Beach to the North East of Gore Hill (approx 37 km away taking over an hour for a standard sedan)
- Brooklyn to the North of Gore Hill (approx 44.9km away and taking around 50 minutes for
- Manly to the East of Gore Hill (approx 13 km away taking around 30 minutes for a standard sedan)
- Kirribilli to the of South of Gore Hill (approx 4.4 km away taking around 10 minutes for a standard sedan)
- Carlingford to the West of Gore Hill (approx 19.4 km away taking around 20 minutes for a standard sedan)

These times refer to travel time only and would not take into account times to find the specific address or light at fault, or to park the vehicle. Travel times above relate to a standard sedan which, intuitively, would have a significantly faster average speed in traffic than that of a truck with an elevated work platform.

Incorporated within travel time is time taken prior to and following daily patrols. Maintenance crew are responsible for ensuring the truck and plant on the truck has sufficient inventory to undertake daily tasks and is safe and reliable.

Added to this are relevant administrative activities before and after a shift. Between 15 and 45 minutes can be taken for this task.

EnergyAustralia routinely groups replacement tasks within a common locality. However the ability to do this is limited with a target of 8 days repair times[58]. It is rare for repairs to be conveniently clustered and more likely for some travel time 2-3 suburbs away.

By way of example a journey between Avalon and Dee Why is approx 16 km or 28 minutes for a standard sedan (and therefore more for a truck)[59].

Clustered work is more likely for "held" notifications (notifications that are complex or have traffic access issues). There are two reasons for this. Firstly "held" notifications are not reported in turnaround statistics, so therefore there is more time to align scheduled tasks.

Secondly, there are limited windows for access to lights on many traffic areas. More administrative work is undertaken to maximise RTA windows in regard to repair[60].

Therefore, while these jobs are more likely to be closer together, the nature of the repair requires a greater amount of preparation. Even so, it is rare to for a string of held notifications within a kilometre of each other and within a similar time period.

Given the above factors, EnergyAustralia has assumed an average time of 20 minutes between spot maintenance tasks (travel time). This is considered conservative given:

[57] Articles and documentation regarding Sydney traffic congestion are attached as part of supporting documentation to this submission

[58] As per NSW Public Lighting Code

[59] A copy or relevant material using Google maps between Avalon and Dee Why is attached to this submission.

[60] Interaction with the RTA is undertaken by an external contractor. EnergyAustralia emails the contractor requesting a window for maintenance of the street light with traffic access (a copy of such request is attached). The contractor completes a design of the traffic lights in question and submits this to the RTA. The RTA provides a window to complete the work to the contractor who in turn notifies EnergyAustralia.

- the large proportion of travel that is inherent in spot maintenance work.
- the distance from the depot to the first repair task and from the last; and
- the limitations on notifications being clustered in any one region.

EnergyAustralia notes that in respect of approved Miscellaneous and Monopoly fees, the AER has approved a default travel charge relating to 30 minutes which applies to all charges for monopoly services[61].

Job preparation time is a crucial aspect of the maintenance task.

Prior to any maintenance of the asset being undertaken our crews are obliged to follow EnergyAustralia's work methodology and OH& S requirements.

The following safe work methodology (job preparation) is mandatory for each notification.

- visual inspection of the site and safety discussion;
- preparation of Hazard and Condition Assessment with reference to SWMS (Safe Work Method Statement) and with strict adherence to the Electrical Safety Rules;
- control of the hazards (as trained) ie local traffic control, witches hats etc;
- recording of data (a SL "pink sheet" for the iAMS data base is required); and
- "harnessing up" and ready to manoeuvre the elevated work platform.

Job preparation time to "ready for work" takes a minimum of 10 minutes to complete. It is likely job preparation would take longer where additional situational hazards need to be identified, assessed and managed.

As part of its submission EnergyAustralia has included a case study (field observation) of the activities of one of its street lighting repair crews, which provides substantiation of the time taken to prepare for a job.[62]

Repair task

There are a wide variety of tasks that may be required for each notification. These tasks range from routine to complex.

In its field observation. EnergyAustralia profiled a repair crew undertake a "simple" lamp replacement where the fault was identified immediately, there were no obstructions to access the light and the lamp was easily replaced. This simple repair task included:

- positioning the EWP to the light;
- the initial inspection of the light;
- removal of the casing;
- investigation of the fault;
- repairing of the fault;
- replacing the outer casing;
- inspecting the light;
- positioning the EWP to the truck;
- filling in necessary paper work; and
- leaving the site.

Between "ready for work" and leaving the site, was approximately 10 minutes. [63]

EnergyAustralia has assumed 10 minutes actual repair time in its opex assumptions. It should be stressed that this is a

[61] AER Final Determination, p459

[62] Documentation related to a field observation of public lighting maintenance works is attached as part of supporting documentation to this submission.

[63] Further detail is provided in EnergyAustralia's documentation relating to field observation attached as part of supporting documentation to this submission.

conservative estimate and more likely to represent a minimum repair time per repair task, rather then an average.

Our case study observations [include attachment] demonstrates that repair tasks can be far more complicated than a simple lamp replacements and, in extreme cases, can take over an hour to complete.

In summary, EnergyAustralia has assumed a 40 minute total repair time, taking into account:

- travel time of 20 minutes
- job preparation of 10 minutes
- actual repair time of 10 minutes

This is based on our observations of repair tasks undertaken in the field.

Failure rates for spot lamp items

As part of its review of the optimum bulk lamp replacement cycle, EnergyAustralia analysed the lamp failure profiles at both a regional level and EnergyAustralia wide. The lamp failure and replacement data records were analysed to establish if there is a clear wear-out characteristic associated with the lamps, ie an age degradation failure mode, and when it occurs.

Since 2006, EnergyAustralia has been replacing lamps and other components in 4 of its 6 regions at a planned 30 months interval, and averaging 34 months. As a result

- the age at asset failure in those regions has been limited to failures of lamps younger than 30 months
- data from the statistical distributions from the failures cannot not be used beyond 3 years for projection of future failure rates.

The failure rates applied in EnergyAustralia's build up of spot maintenance costs are observed from the failures recorded in the field on its network since 2006.

Energy Australia's analysis considers both the changes in populations arising from failures and infant mortality in new lamps. Failures of lamps at a life of shorter than 10 days were removed from the analysis as these were considered to be due to installation / handling / transport issues and not associated with the inherent reliability of the lamp.

The observed failure characteristic distributions are converted to an expected annual failure rate[64].

The recorded lamp failures are inputs into the model and are statistically analysed by EnergyAustralia.

EnergyAustralia's revised analysis showed a surprising change in spot failure rates. Spot failure rates for EnergyAustralia's most common lamp types based on a 3 year cycle appear below.

[64] Annualising the spot rate costs distorts the total cost analysis to some degree, depending upon the time based distribution of the failures.

3. Operating expenditure (continued)

Lamp type	June 2008 Proposal	AER determination	2010 analysis
MBF1x80	6.00%	2.00%	2.43%
TF2x20	40.46%	11.00%	11.00%
MBF1x250	10.00%	6.00%	1.68%
MBF1x50	10.00%	6.00%	1.01%
SON1x250	15.00%	5.00%	3.66%

The significant change in results has raised concerns. EnergyAustralia is still investigating the analysis but is particularly concerned the spot failure rates are understated.

As a consistency check we reviewed the number of lamp failures recorded against materials in stores. For our 7 largest lamp populations, of the 250,000 lamps booked out of stores, we found that 20,033 (or 8%) were not recorded on our systems (in terms of usage for bulk or spot maintenance or capital works).

This could mean that a material proportion of lamp replacements are occurring and no information is being recorded thus distorting the failure rate conclusions to artificially lower rates[65]. EnergyAustralia will continue to look into the analysis further.

Apart from issues with our input data, we note that our statistical distribution is fitted to the service life we are experiencing and uses our population of data in which lamp replacements are scheduled every 2.5 years. Our distribution therefore may not capture the rapid failure "knee-point" where failures accelerate. Therefore using these statistical distributions for spot replacement data at periods longer than 3 years is not recommended.

[65] Other reasons could include fluctuations in BLR contractor held stock. The extent to which this variance impacts spot failure rates is unclear at this time.

EnergyAustralia is not confident that the rates stemming from the analysis are a true representation of spot failure rates likely under a 3 year cycle. While we have based our analysis on the best available data, we consider the rates considerably conservative and cannot justify the efficiency of the forecast lamp failure rates.

Spot PE Cell replacement

The annual operating expenditure requirement for each lamp is the expected cost of the labour required to replace the PE Cell each year, which is calculated by the following:

Annual operating expenditure = Labour rate x hours required for repairs x replacement rate

In this case EnergyAustralia has allowed the same labour rate and time to replace a PE Cell as that required to replace a lamp.

Spot Miscellaneous repairs

The annual operating expenditure requirement for miscellaneous repairs is the expected cost of the labour required for miscellaneous repairs each year, which is calculated by the following:

Annual operating expenditure = Labour rate x hours required for repairs x replacement rate

In this case EnergyAustralia has allowed the same labour rate and time to replace a PE Cell as that required to replace a lamp.

Spot Materials assumptions

The cost of materials has been calculated in three categories – Lamps, PE Cells and Miscellaneous.

The annual operating expenditure requirement (for each public light type) for each of the three types of materials costs are calculated by the following:

Annual operating expenditure = Materials price x failure Rate x lamp count

In the case of lamps, where more than one lamp is part of a luminaire it is assumed that all lamps are replaced in the lamp replacement task and therefore the lamp price is multiplied by the number of lamps.

The lamp prices have been accepted by the AER, by referencing several invoices showing the purchase price (ex-GST). PE Cells and Visors have not been verified by the AER to date.

Elevated work platform rate for spot maintenance

Modelling basis

When EnergyAustralia undertakes spot maintenance on any public light an elevated work platform is required for the work crew to access the light. The bulk contractor must provide its own EWP. The normal hourly rate for an EWP is assumed to be $45 per hour[66].

Connection maintenance assumptions

When an underground connection of a public light fails, due to water ingress, corrosion or other reasons, EnergyAustralia 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 testers, jointers and substation staff. 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.

Modelling approach

The annual operating expenditure requirement to maintain underground connections is calculated by the following:

Annual operating expenditure = Flat rate x number of connections

The flat rate is an input to the model, but calculated by reference to actual costs of repairing underground connections.

EnergyAustralia was unable to calculate from empirical evidence or observation an average cost of a connections maintenance task in the time allowed to prepare its submission:

- EnergyAustralia does not routinely keep data associated with time taken to perform connections maintenance tasks;
- There is a wide distribution of complexity associated with connections repairs making an average cost difficult to determine.

In its June 2008 proposal, EnergyAustralia included connections operating costs based on the rates calculated as part of our 2005 pricing proposal to IPART[67]. EnergyAustralia therefore applied the same rates in nominal terms as what was proposed in 2004/05.

We have maintained the same rates in real terms from the 2008 proposal. We demonstrate the reasonableness of our assumption for connections operating costs to the extent that this forecast is conservative and likely to understate the operating costs associated with connections.

Therefore, EnergyAustralia has calculated the annual cost per connection based on assumptions used in its previous proposal to IPART with no escalation to 2009/10.

Overhead costs

EnergyAustralia incurs many overhead costs, which are allocated to public lighting costs in accordance with our approved cost allocation methodology. The historic contribution of allocated overheads is 25%[68].

[66] EnergyAustralia did not have any documentation supporting a $ per hour rate for EWPs and therefore based its assumptions on efficient rate for EWP costs that the AER determined for Integral Energy (note supplementary draft determination p41). EnergyAustralia is not aware of any issue that would require it to adopt a different assumption for EWP rates compared to that of Integral.

[67] The rates used in our 2004 proposal can be found in appendix G of PB's report "Street Lighting Cost to Serve" 2003 prepared for EnergyAustralia.

[68] Also accepted by the AER in its final determination (p359)

3. Operating expenditure (continued)

Examples of the costs that are normally expensed include non-operational staff, for example the business analysts and administration staff managing the following:

- asset register;
- billing systems;
- fault notification systems;
- debtor management;
- dispute management (between two public lighting customers as to asset ownership);
- contact centre operations; and
- corporate/executive costs.

The annual operating expenditure requirement to allocated overhead costs is calculated by the following:

Annual operating expenditure = Rate x sum of other costs

Additional overhead allocation for quarterly patrols

Since 2008, EnergyAustralia has been undertaking quarterly night patrols on major traffic routes in its network area. Quarterly night patrols in some areas have dramatically improved public lighting statistics. EnergyAustralia has improved its average days to repair from 11.6 per year in 2007/08 to 2.1 days in November 2009.

However, while the patrols have had a profound impact on performance in some areas, it has come at a cost incremental to the prices paid by customers for the public lighting service.

EnergyAustralia is reviewing the performance of overnight patrols. At this stage EnergyAustralia is limiting these patrols to Category V lamps. Assuming a cost of $1.50 per lamp inspected[69] and approx 15% of lamps representing Category V lamps, the approximate efficient cost of quarterly patrols in EnergyAustralia's network is $225,000. This has been applied by way over an addition to the existing overhead allocation by an amount of 1.75%.

3.6 Assessment of EnergyAustralia assumptions against AER

AER's proposed bulk lamp replacement

On the basis of the studies conducted, EnergyAustralia cannot justify the efficiency of a twin bulk lamp replacement cycle.

The AER's final decision rejected EnergyAustralia's bulk lamp replacement cycle and substituted a new bulk lamp replacement cycle of:

- 4 years for 150W, 250W and 400W high pressure sodium (HPS), compact fluorescent and fluorescent lamps; and
- 3 years for all other lamps.[70]

The AER concluded this decision "on the basis of analysis of technical information, submissions from interested parties, the AER's recent public lighting determination in Victoria and the bulk lamp replacement cycles used by other NSW DNSPs and DNSPs from other jurisdictions"[71]. This included information from:

- Victorian Sustainable Public Lighting Action Group (VSPLAG)–Technical Reference Group. It should be noted that this report relied on data provided by EnergyAustralia; and
- Sylvania Lighting (a manufacturer).

The AER decided to exclude from its consideration the information contained in EnergyAustralia's network maintenance standards report on the basis that "the report is now over five years old. As a consequence it does not factor in a number of important changes in EnergyAustralia's public lighting operations".[72]

[69] Based on cost per lamp of bulk lamp contractor quarterly inspections.

[70] AER determination, page 346
[71] AER Final Decision, page 345
[72] AER Final Decision, page 344

Importantly, EnergyAustralia's 2004 Network Maintenance report notes

> The difficulty in reaching a final strategy for the management of street lighting is due to the variety of street lights currently in service, and the fact that these do not exist in large areas of homogenous populations except possibly at intersections and along portions of the Traffic Route Lighting (TRL). At March 2003 EnergyAustralia has 53,724 lamps designated as TRL and 186,320 lamps designated as non TRL, each with a large variety of types.[73]

This situation has not materially changed. While the AER is correct that evidence suggests that high pressure sodium (HPS), compact fluorescent and fluorescent lamps have failure rates that would accept a longer bulk lamp cycle, in reality these lamps represent under 20% of total lamps and are interspersed with other lamp types.

EnergyAustralia has not attempted to cost two bulk replacement programs but submits that the co-location of lamp types is sufficiently strong to remove any benefit from scale economies under bulk lamp replacement.

EnergyAustralia reiterates that it has updated its public lighting maintenance report to include more current data and information on lamp types and failures.

AER's spot lamp replacement assumptions

Time taken to repair a lamp

On the basis of the analysis undertaken, EnergyAustralia cannot justify as an efficient assumption the AER's assumed time taken for each spot maintenance task.

In the Final Determination the AER assumed:[74]

- 25.33[75] spot lamp changes could be undertaken per day by a two man team over a 8.33 hour[76] day, irrespective of whether the public light was located on a main or minor road[77]; and
- there was no labour cost of traffic control for construction or maintenance of public lights located on main roads;[78].

The AER used these assumptions to calculate that a single spot lamp replacement would require a 2 man crew 20 minutes to complete a spot maintenance task, and that this time would incorporate all tasks undertaken by the crew in the day.[79]

Source documentation or evidence justifying this assumption is vague. References trace back to the ESCV's 2003-04 review of public lighting service charges. The following assumptions are gleaned from the ESCV's review[80]:

- [Mercury vapour 80 Watt] "A repair crew repairs 30 lamps per day in the urban areas and 25 lamps per day in the rural areas, based on information provided by contractors."
- [Sodium high pressure 150 W] "A repair crew repairs 20 lamps per day in the urban areas and 16 lamps per day in the rural areas, based on information provided by contractors."
- "The working day is assumed to be 8 and one third hours"

Apart from the vague reference to information provided by contractors, EnergyAustralia has been unable to find any other evidence justifying the assumptions made by the ESCV.

---

[73] EnergyAustralia, *Network Maintenance Report*, 2004 page 7
[74] There is no substantive discussion of this topic within the Draft or Supplementary Draft Decision
[75] AER Final Decision, pp 353 and 400
[76] AER Spreadsheet: "*AER revised - EA Annuity Model T3 T4.xls" cells "C31-D32" on the "Inputs – General" tab*, 30 April 2009
[77] Statement of Facts, Part 3, Chapter 3, paragraph 267.
[78] Statement of Facts, Part 3, Chapter 3, paragraph 271. Also see AER Final Decision, p 400 – the AER's assumption that 12 new luminaires will be installed in bulk per day applies to both main and residential roads, this equates to the same estimate of 1.39 man hours to construct or replace a public light.
[79] Statement of Facts, Part 3, Chapter 3, paragraph 268. Also see: AER spreadsheet: "*AER revised - EA Annuity Model T3 T4.xls" cells "C31-C32" on the "Inputs – General" tab*, 30 April 2009
[80] ESC, Review of Public Lighting - Issues Paper, 28 August 2003, p20-21

3. Operating expenditure (continued)

EnergyAustralia reviewed submissions provided to the ESCV to ascertain whether the assumption could be justified.

Most Victorian DNSPs did not agree with the ESCV's assumptions:

> The Paper also assumes daily lamp repair rates of 30 in urban areas and 25 in rural areas. The average repair rate for urban areas serviced by Powercor Australia is 18 per day based on a service predominantly acquired through external contractors. For CitiPower the average daily lamp repair rate is 16, again based on a service provided by external contractors acquired through a tender process. Finally in rural areas Powercor Australia's experience has been a daily repair rate of 12. The Paper's assumptions regarding lamp repair rates are again totally inconsistent with what is observed in the market and the experience of distributors.[81]
>
> …
>
> The commission is relying on information supplied by a single contractor which does not represent a robust approach for benchmarking distributor public lighting costs.[82]
>
> …
>
> 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; and
>
> • Clear work site and pack away tools.
>
> It is not possible for this to be done at an average of less than 17 minutes per job. AGLE discussed this matter with its contractor, who said that, when asked how many repairs could be done in a day, his reply was 30. However, he did not inform the Commission that this would involve a day of approximately 12 hours. Additionally, each of the repairs would need to be straightforward, there be no delays and the work sites to be reasonably close geographically.
>
> AGLE believes that a more realistic number of repairs that can be carried out in a 8 1/3 hour day would be 10 for urban (ie 50 minutes per repair) and 7 for rural (1 hour 11 minutes per repair)"[83]
>
> …
>
> These numbers take account of the fact that the normal workday is 8.33 hours... Not all of these hours are productive hours; the crew requires some time at the commencement and conclusion of each day in the depot to prepare for the day and to dispose of the used material and clean up at the end of the day. There also needs to be some allowance for travel to and from the job…
>
> On average there are about 6 hours available for productive work each day…. In this time [available for maintenance] the crew is required to:
>
> • Set the Elevated Platform Vehicle in an appropriate position;
>
> • Establish the four safety legs to ensure the vehicle's stability;
>
> • Deploy a crew member in the bucket with any necessary safety gear attached;
>
> • Remove and replace the lamp and where necessary the PE cell

[81] Citipower/ PowerCor, Submission to ESCV, 26 November 2003, p3

[82] Citipower/ PowerCor, Submission to ESCV, 4 June 2004, p4-5

[83] AGLE, Submission to the ESCV, 21 November 2003, p3

• Return the Crew member in the bucket to the travelling position;

• Lift the safety legs;

• Drive to the next light, on average about 50m (in urban areas).[84]

On the basis of the above material, EnergyAustralia cannot justify the assumptions made by the AER in respect of spot lamp replacement times:

- there is a lack of specific information and evidence in the AER's assumption;
- the proposed time relates to a Victorian ESCV decision and is likely to be based on one contractor's quote in 2003 or earlier[85];
- Victorian DNSPs queried the assumptions made by the ESCV, stating they did not reflect business practice. Submissions correlated to observations made by EnergyAustralia in making its own assumptions;
- EnergyAustralia has not reviewed Victorian obligations in regard to safety and OH&S, but notes generally that obligations and requirements for safety and OH&S have increased since 2003; and
- the ESCV assumption formed part of a set of building block assumptions that derived a "safe harbour tariff". Effectively, this meant that tariffs could be increased within 10% of the reference tariff without requiring further approval. This is different to the decision making process the AER faces with EnergyAustralia.

Failure rate assumptions

On the basis of the information available to EnergyAustralia, EnergyAustralia cannot justify assumptions based on laboratory testing in preference to EnergyAustralia's field analysis.

Firstly the lamp mortality rates provided by manufacturers are known to be optimistic as they are measured in controlled laboratory or selective site conditions. Such failure rates do not account for failures that occur due to:

- storms, wind, heat, moisture, coastal conditions, etc;
- Failures in other components: PE Cells failing to switch a lamp off overnight increasing the burning time, corroded connections causing resistance;
- traffic influence (vibration) and accidents: car hits pole situation; and
- vandalism.

Secondly, the replacement lamps will also have a probability of failure in the year they are replaced. For example, if failure rates dictated that 5% of lamps would fail in any year, then more than 5% of the population of lamps would be expected to be replaced. This is because that a corresponding proportion of the replacement lamps will also fail, so in addition to the original 5% of the population that failed some of the replacement lamps will also need to be replaced.

3.7 Independent review of EnergyAustralia's model

PB review

EnergyAustralia engaged PB to undertake analysis of our operating expenditure assumptions and to form a view on whether EnergyAustralia's proposed forecast operating expenditure represents the efficient costs in providing public lighting services in EnergyAustralia's network area[86].

This task involved a high level review of EnergyAustralia's model and the assumptions underlying the proposed costs.

[84] TXU, Submission to ESCV, 21 November 2003, p4.

[85] EnergyAustralia notes the AER's decision (p3440 to not consider EnergyAustralia's 2003 maintenance report on the basis that it was out of date.

[86] Parsons Brinkerhoff "*Independent review of public lighting for EnergyAustralia"* January 2010

3. Operating expenditure (continued)

A high level benchmark of costs demonstrated that EnergyAustralia is comparable with other business on key indicators.

PB noted some historical increase in operating expenditure but noted similar trends in other DNSPs. PB noted increases in material and labour costs and movement towards meeting the NSW Public Lighting Code as reasons for the increase.

PB concluded that with the exception of spot failure rates, the assumptions made by EnergyAustralia in forecasting expenditures were found to be reasonable.

PB did express concerns as to whether the spot failure rates could be relied upon to determine the optimal bulk lamp replacement cycle. PB noted that the spot failure rates for most lamp types show a decreasing trend despite initially high numbers of failures.

In PB's view, a decreasing trend indicates that the data does not contain significant lamps approaching end of life and on that basis concluded that a 2.5 year cycle could be shorter than what could be considered optimal.

However, PB also noted that the underlying data did not contain significant information on failures beyond 3 years and therefore noted the optimum replacement period cannot be empirically determined on the available data.

Nevertheless, PB supported EnergyAustralia's decision to move to a 3 year cycle as it represented a prudent and reasonable decision in the context of its own circumstances, having regard to industry peers.

PB concluded that, in its view, EnergyAustralia's forecast of expenditure for public lighting services is efficient as envisaged by the NEL and NER.

4 Residual Value

EnergyAustralia's submission on the residual capital charge for the early replacement of public lighting assets is directed at satisfying the directions of the Tribunal.

The submission sets out what EnergyAustralia considers is a reasonable approach for incorporating changes to inventory (based on assets being replaced early) in price movements between years.

Our submission outlines the issues surrounding early replacement of assets under a "fixed charge" regime. We note particularly the obstacles this creates in ensuring price transparency. We offer an alternative approach which would improve transparency, minimise uncertainty and still meet the AER's preferred control mechanism.

4.1 Basis for submission

Element of decision that EnergyAustralia is seeking to vary

EnergyAustralia is seeking the determination to be varied so that the AER specifies a clear and specific control mechanism for the determination of the residual charge for the capital asset being replaced early.

Tribunal directions

The Tribunal determined that AER did not specify a sufficiently clear or specific control mechanism for the determination of the charge for the residual capital value of the asset being replaced early.

The Tribunal was concerned that double-charging customers may occur unless sufficient specificity is included in the AER's determination[87].

4.2 How prices are calculated for pre 1 July 2009 assets

AER tariff class 5 applies to assets constructed after 30 June 2009 and that are capital funded by the DNSP but where the asset is replaced at the request of the customer before the end of its economic life. The Final Decision provided that the basis of the tariff determination of AER tariff class 5 is as follows:

> "Tariff calculated by the DNSP at the time of agreement to replace the asset early using an agreed method for determining the residual capital value of the asset. The charge is to be paid up front. Residual asset charge calculated for replaced asset based on remaining life determined through an assessment of the assets condition and / or type or the AER default value". [88]

The Final Decision also provides the following in respect of early replacement of assets at a customer's request:

> "Tariff class 6 (now tariff class 5) is defined as the charge calculated at the time of agreement by a customer to replace the asset early using a method agreed with the NSW DNSP for determining the residual capital value of the asset (table 17.2).
>
> The charge is to be paid for upfront.
>
> The residual asset value calculated for the replaced asset is to be based on the depreciated original capital cost of the asset, with the remaining life determined through an assessment of the asset type and/or condition or the AER default value." [89]

The Final Decision therefore bases a charge on a 'method agreed' to calculate a residual value for an asset replaced early.

In EnergyAustralia's experience, establishing a charge for an asset being replaced under a detailed regulatory regime is a

[87] Australian Competition Tribunal, *Application by EnergyAustralia* [2009] ACompT 7, [81].

[88] AER, Final Determination, p 334.
[89] AER, Final Determination, p 390.

difficult concept upon which to agree a method. We believe all parties would benefit from greater prescription of the method:

- greater specificity in how the residual value is calculated minimises uncertainty and risk of ex-post amendments to "agreed methods";
- a transparent approach in calculating the residual value also improves the transparency of the roll forward of the RAB between periods and can ensure consistency with financial capital maintenance (outlined in chapter 2);
- there are difficulties in applying the AER's decision in respect of determining the value. There will be disagreement over the depreciated original costs, or the value of the asset (in terms of condition) and the economic life of the asset (refer to chapter 2);
- customers are entitled to clear and transparent prices. This should also include an unambiguous method for calculating how much they pay for an asset that has been replaced early. We believe this will aid decision making for all customers.

4.3 Replacing assets earlier than their specified life

In some circumstances, a customer may request a new asset to replace an existing asset. In these circumstances EnergyAustralia may not have recovered the value of the investment on that existing asset. Assets are replaced early for a number of reasons:

- customers may wish to change the asset for aesthetic reasons;
- customers may wish to move toward more energy efficient assets, reducing energy consumption; and
- assets require replacing out of a necessity (change of land use, vandalism etc).

The AER's final determination is relatively clear on the treatment of the replaced asset. However, the specifics of how EnergyAustralia recovers that part of its investment which it has not recovered and how this value is adjusted for in pre 1 July 2009 fixed charges is less clear. Small modifications which complement the AER's final determination would provide the necessary specifics to be applied in determining the residual value.

4.4 Obstacles to transparent pricing

Price movements between years are limited by the AER's control mechanism. For pre 1 July 2009 public lighting assets, the AER controls prices by establishing a nominal fixed charge for each customer.

This charge is set out in Appendix P of its determination and is based on the AER's calculated return on capital, return of capital and opex and applies to the inventory[90] of pre 1 July 2009 assets each customer has.

EnergyAustralia's price for customers must reconcile to this fixed charge amount.

There are obstacles to establishing a transparent price list for customers under this type of control. This is because the AER "controls" movements in a fixed charge per customer rather than a price component. Problems occur if the underlying quantities of inventory on which the original fixed charge is based change during the period.

For example, if a customer would like an asset to be replaced before the end of its useful life, then the customer shall pay EnergyAustralia the remaining undepreciated value of those assets. Unless some adjustment is made then customers will pay twice for charges.

1. If an asset is replaced before the end of its useful life and the customer pays EnergyAustralia the undepreciated value, then the customer has returned the capital to EnergyAustralia. Therefore the future fixed charges in Appendix P should be recalculated to exclude the capital already returned.

[90] Note that the inventory used to calculate the fixed charge at June 2009 did not reconcile with the actual inventory each customer had at June 2009 as the calculations were made using November data

2. If an asset is replaced before the end of its useful life then it will attract the maintenance charge for assets constructed after June 2009. Therefore the amount of opex in the AER's fixed charges to maintain the old asset must also be removed from the fixed charges in Appendix P as the old asset will not incur any maintenance charges.
3. The AER's fixed charge in Appendix P is quoted in nominal dollars and includes a forecast amount of CPI. It is common practice to set real prices and inflate them annually as CPI estimates for the coming year become more accurate. To not allow a CPI adjustment adds inflation risk.

The AER's final determination states that adjustments may be made to the fixed charge between years. However, because there is no specification of the adjustment and because the adjustment is required to be made to the fixed charge, it is difficult for EnergyAustralia to understand how to reconcile to the AER's fixed charge in its price list.

It is also difficult for EnergyAustralia to explain to customers how prices will be allocated to inventory in any given year.

Some of these obstacles with minor modifications to the final determination. This includes:

- establishing a clear formula for calculating the residual value of assets replaced early;
- establishing the fixed charge each year on the basis of a separate capital and operating charge. The capital charge adjusted for the residual value of assets replaced early and the operating charge based on the inventory on hand.

EnergyAustralia will discuss proposed changes to the maintenance charge in the next chapter.

Our proposed approach to calculating the residual value of the asset replaced early is discussed in the next section.

4.5 Proposed changes to the control mechanism

The control mechanism associated with the early replacement of assets, should be a formula for each component to determine the sunk value based on the number of assets, the average remaining life of the assets and CPI.

Sunk Value = ***f***(Average Remaining Life, Quantity of Assets to be replaced, CPI)

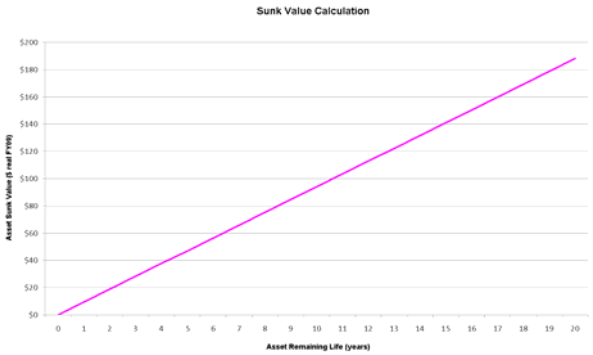
The formula proposed by EnergyAustralia is based on the straight line depreciation of the opening regulatory asset base, the indexation of the opening regulatory asset base (as per standard distribution control services) and the number of assets being replaced.

Where:

- the function for each component is provided as an appendix to the AER's determination and is determined from the RAB allocation in the AER's final determination. This function is based on the straight line depreciation that is embedded in the RAB allocation;
- the average remaining life is stated in the AER's final determination model;
- CPI is the annual number used by the AER to approve price increases for that year; and
- quantity of assets to be replaced is determined by the customer.

The control mechanism could easily accommodate a formula or schedule for determining the residual value under the AER tariff class 5. As an illustration the formula for a single asset could be:

Sunk Value (real $ FY09) = 9.40 x Remaining Life



4 Residual Value (continued)

EnergyAustralia has prepared a table which calculates a sunk value function for its population of public lighting assets. This function for each asset component is calculated in the RAB roll forward model and is attached as Schedule 4.

In a simple example, if EnergyAustralia had a population of 5 homogenous assets whose opening RAB value was $500 and the average remaining life was 10 years, the sunk value calculation is $500 (real $FY09).

In FY11 the customer seeks to replace 2 of these assets then the sunk value of those two assets in the opening RAB would be:

= 2/5 x $500

= $200

The customer pays the fixed charge for two years, FY10 and FY11 and then the asset is replaced, so the remaining life in FY11 reduces by two years to 8 years. Therefore, the residual value to be recovered is the opening sunk value ($200) reduced by the proportion of the time passed and the remaining life:

= (10-2)/10 x $200

=$160

This amount is still represented in dollars of the opening RAB value, that is real FY09 dollars. Therefore the final step is to adjust by two years of CPI (assume 2%)

$=\$160 \times (1 + 2.5\%)^2$

=$168

This detailed calculation can be can be distilled into the following formula for each asset, which is simple when using a spreadsheet:

$= \text{real dep'n}_{FY09} \times \text{remaining life}_{FY11} \times \text{assets replaced} \times (1 + \text{CPI})^N$

$=\$500/(10 \times 5) \times 8 \times 2 \times (1+2.5\%)^2$

=$168

EnergyAustralia has provided a table showing the sunk value functions for its asset population.[91]

It should be noted that this approach is a simplified model which applies a sunk value function of EnergyAustralia's asset population to a smaller population – each individual customer. Differences are expected between the average remaining life of the population and the customers with any difference being allocated to or from the value of other assets in the class. Nevertheless this approach is consistent with the calculation of the fixed charges, is simple and compared to other alternatives that do not create windfall gains and losses.

Consistency with financial capital maintenance

There is an obvious and important link between the pricing of assets replaced early and the financial value of the asset base being rolled forward between periods. EnergyAustralia maintains that irrespective of the method adopted, the AER should ensure that EnergyAustralia has the opportunity to recover its initial investment in any asset.

Consistency with approach for standard control services

The AER's control mechanism for standard control services is clear and capable of implementation without further approval.

The determination sets "X-factors", based on a predetermined weighted average price cap (WAPC) formula. EnergyAustralia is able to establish tariffs for each customer consistent with this formula and any limitations or adjustments in Part I of Appendix 1 of the Transitional Rules. The AER's approval of a pricing proposal relates predominantly to the DNSP's compliance with the control mechanism.

[91] EnergyAustralia's sunk value function calculation is attached to this submission

5. Maintenance charges

EnergyAustralia's submission sets out a reasonable approach for pricing public lighting services for assets constructed before 1 July 2009.

We outline the difficulties and inflexibility with the current pricing mechanism and propose an alternative approach which effectively unbundles the capital and maintenance charges for Pre-July 2009 assets. We outline reasons why this approach would improve transparency, simplicity and minimise uncertainty and administrative cost.

5.1 Basis of EnergyAustralia's submission

Element of decision that EnergyAustralia is seeking to vary

EnergyAustralia is seeking to vary the AER's decision regarding pricing of pre 1 July 2009 assets so that the fixed charge for these assets can be easily separated into capital charge and maintenance components.

Tribunal's directions and reasons

The Tribunal noted EnergyAustralia's preference for separating out of the fixed capital charge from operating and maintenance charges associated with the public lighting component. It decided that as the matter will be remitted, the order sought by EnergyAustralia can be considered by the AER[92].

5.2 EnergyAustralia's experience in price setting

The approach to pricing under the AER's determination does not easily allow customers (or EnergyAustralia) to verify the bill calculation.

EnergyAustralia's experience is that customers are actively seeking explanation of how bills are calculated.

Clause 13 of the NSW Public Lighting Code also requires that bills provided by a Service Provider must identify, both separately in summary form, the charge for each type of Public Lighting Service provided, and must contain at least the detail of the number and type of lighting and any other information reasonably necessary for the customer to verify the accuracy of an amount charged on the bill.

While we can notionally comply with customer and Code requirements we believe that it is in the interests of customers that the calculation of charges is easily demonstrable and simple. This is best done through the unbundling of the fixed charge for pre 1 July 2009 assets.

EnergyAustralia believes this would be consistent with the AER's acknowledgement that it would be appropriate to provide customers with billing information that would allow "customers to verify the calculation of their charges".[93]

Separating the fixed capital charge from the operating and maintenance charge provides the flexibility and transparency required to ensure that customers are charged capital, and operating and maintenance charges, that reflect the public lighting services that they actually acquire.

5.3 Our concerns with the transparency of pricing for old assets

A number of the issues identified by EnergyAustralia in its appeal of the public lighting decision arise from the adoption of a total customer bill amount as the purported control mechanism for assets constructed before 1 July 2009.

The AER's basis to set a fixed charge for pre-2009 assets was that using a replacement value, as proposed by EnergyAustralia, could have overvalued pre-2009 assets and consequently, resulted in a windfall loss to customers. EnergyAustralia understands how this issue relates to historic capital value, however, we submit that there is no efficient

[92] *Application by EnergyAustralia* [2009] ACompT 7, [81].

[93] AER Final determination p399

5. Maintenance charges (continued)

basis to set a bundled charge which fixes capital and operating charges for the period. Our concerns with a bundled charge are outlined below:

- customers are subject to two different pricing regimes. A price for post 1 July 2009 assets that is made up of a capital and operating charges and a bundled charge for pre 1 July 2009 assets.
- bundling the capital and maintenance charge requires a forecast of the pre-July 2009 assets over the regulatory period. An inaccurate forecast will ensure that some customers pay too much maintenance throughout the year and others not enough. The AER determination applied a forecast that assumed none of the pre-July 2009 assets would be retired and therefore attracted a maintenance charge throughout the regulatory period.
- to address the inaccurate forecast, the AER determination proposed an end of year true up, which in practice is very complicated, to ensure customers are only pay for maintenance charges for assets still subject to a maintenance service.
- because the outcome of the true up is effectively to back solve to incorporate a maintenance charge per asset, it makes more sense that, each billing month, the customer pays for the maintenance price per asset for the actual number of assets in service that month. Such an approach circumvents any need for an annual true up of maintenance charges and avoids administrative costs to EnergyAustralia, the Customer and the AER.
- the complicated and detailed true up adjustment places a lot of pressure on annual pricing proposal and approval, which is required to occur in a truncated timeframe. This adds avoidable risk of errors being made in the calculation of prices and charges for future years, especially because the determination true up process has not been defined in very much detail.
- the absence of a clear mechanism for adjustment creates uncertainty with the compliance to the control mechanism and applying prices based on adjustments that have not been approved yet.

Costs and Benefits of moving toward transparent prices

EnergyAustralia submits that a fixed charge based on separate operating and capital components improves pricing transparency. An unbundling of charges is better for the customer and leads to reduced ambiguity and complexity.

EnergyAustralia believes that a fixed charge based on unbundled capital and operating components improves transparency and simplicity while remaining consistent with the AER's preferred control mechanism.

5.4 Proposed approach

For the purposes of the decision to be re-made by the AER, EnergyAustralia proposes an amendment to the approach to pricing which separates out the capital charge from the maintenance charge.

EnergyAustralia submits that in re-making the decision, the AER should vary the final determination to provide that the control mechanism for EnergyAustralia's alternative control services consist of:

- a fixed capital charge per customer for assets constructed before 1 July 2009. This charge is the return on the regulatory asset base plus the return of the regulatory asset base for each customer;
- a fixed schedule of capital prices for assets constructed after 30 June 2009. This charge is the annual capital return based on an annuity calculation. This schedule is for assets that EnergyAustralia has funded upfront. Assets that are funded by the customer are only subject to the schedule for maintenance.
- a fixed schedule of maintenance prices for all assets that EnergyAustralia maintains;
- the fixed charge for pre 1 July 2009 assets representing the sum of the capital charge and maintenance charges per customer based on estimated inventories at the beginning of the year;

- a fixed schedule of rates for the sunk value of assets that are replaced early at the customers' request. This shall be presented as a formula for each *capital* asset to calculate the sunk value. This rate would be charged for the asset retirement before the end of the life established in the final RAB roll forward and revenue model used to calculate the opening year price and revenue controls.

6. Correcting other Errors identified by the Tribunal

EnergyAustralia's submission could not have included proposed price schedules without first correcting all errors identified by the Tribunal.

The submission sets out the errors identified by the Tribunal (that have not already been outlined in earlier chapters).

6.1 Errors outlined by tribunal

Weighted Average Cost of Capital

EnergyAustralia notes paragraph 3 of the Tribunal's orders that the AER vary the WACC parameters contained in Table 17.15 of the EnergyAustralia decision in relation to public lighting, by:

(i) deleting the figure of 8.78 per cent and inserting the figure of 10.02 per cent with respect to EnergyAustralia's Nominal Vanilla WACC;

(ii) deleting the figure of 6.83 per cent and inserting the figure of 8.13 per cent with respect to EnergyAustralia's pre-tax real WACC, which is to be applied in the annuity approach for post 30 June 2009 public lighting assets; and

(iii) inserting the figure of 10.81 per cent with respect to EnergyAustralia's pre-tax nominal WACC, which is to be applied in the building block approach incorporating an asset base roll forward for pre 1 July 2009 public lighting assets.

Corporate income tax

EnergyAustralia notes paragraph 6 of the Tribunal's orders that the AER calculate the rate of return for pre 1 July 2009 public lighting assets by reference to the pre-tax nominal weighted average cost of capital ('WACC') of 10.81%.

Indexation of RAB

EnergyAustralia notes paragraph 6 of the Tribunal's orders that the AER is to apply the RAB indexation that it used in the PTRM and RAB roll forward model for standard control services to the RAB indexation in the public lighting modelling for pre 1 July 2009 public lighting assets.

Calculation of depreciation (pre July 2009 public lighting assets)

EnergyAustralia notes paragraph 6 of the Tribunal's orders that the AER is to apply the depreciation calculation that is used in the PTRM for standard control services to the regulatory depreciation allowance in the public lighting modelling for pre 1 July 2009 public lighting assets.

Indexation of operating expenditure by forecast inflation (pre July 2009 assets)

EnergyAustralia notes paragraph 6 of the Tribunal's orders that the AER is to apply forecast inflation, in addition to the real wage inflator, in respect of the annual efficient opex for pre 1 July public lighting assets when calculating the future nominal charges for those assets.

Indexation of operating expenditure by forecast inflation (pre July 2009 assets)

EnergyAustralia notes paragraph 6 of the Tribunal's orders that AER is to apply forecast inflation, in addition to the real wage inflator, in respect of the annual efficient opex for pre 1 July public lighting assets when calculating the future nominal charges for those assets.

Additional labour costs for traffic routes

An allowance be made for efficient labour costs for traffic routes.

Connections operating costs

An allowance be made for efficient opex on pre July 2009 connections operating assets.

Vlookup

The AER is to correct the VLOOKUP error in the public lighting model.

6.2 Demonstration of rectifying errors

EnergyAustralia has prepared documentation outlining its proposed approach to how the AER should rectify errors outlined in the Tribunal's decision.

Our final models incorporate these proposed amendments.

7. Annual price change

This submission to the AER proposes that the final determination in relation to public lighting be varied, such that in the following ways:

- all prices and charges under the control mechanism be subject to an annual CPI adjustment to account for outturn inflation;
- the annual RAB adjustment, to account for recovery of residual value, and be clearly articulated in a mechanistic manner.

7.1 The importance of specifying price changes between years

EnergyAustralia views the control mechanism as a list of annual prices, revenue and/or charges that control how much EnergyAustralia may charge customers for the services it provides in each year of the regulatory period. In most regulatory frameworks the control mechanism includes a specific mechanism to annually adjust for CPI, X-Factors and other specified changes, such as Service Incentive Schemes.

The AER proposed two adjustments, first a CPI adjustment for prices of post July 2009 asset prices. Secondly, it suggested an adjustment for the change in inventory over the year.

EnergyAustralia agrees with the notion of these adjustments, however more specificity is required. EnergyAustralia proposes that adjustments for actual outturn CPI be made as per the following table:

Schedule	Description of price/charge in the year 1 of the regulatory control period	Calculation of price/charges in years 2 to 5 of the regulatory control period
1. Capital Charges for Pre-July 2009 assets	We propose the control mechanism be a fixed charge per customer in the first year, an indicative charge for following years and an x-factor for each customer to calculate charges in the following years.	$Charge_N = Charge_{N-1} \times (1+CPI_{outturn}) \times (1-X\text{-factor})$ We propose the charge for each year be reduced by the return on and return of the residual value already paid by the customer. This requires manually adjusting the RAB roll forward to account for the recovered RAB value. EnergyAustralia would like to work with the AER to develop an appropriate spreadsheet mechanism to undertake this adjustment.
2. Capital Prices for Post-June 2009 assets	We propose the control mechanism be a fixed capital price per asset in each year of the regulatory period (expressed in real FY10 dollars).	$Nominal\ Price_N = Real\ Price_N \times (1+CPI^{FY10+N-1}_{outturn}) \times ... \times (1+CPI^{FY09}_{outturn})$
3. Maintenance Prices for all assets	We propose the control mechanism be a fixed maintenance price per asset in each year of the regulatory period (expressed in real FY10 dollars).	$Nominal\ Price_N = Real\ Price_N \times (1+CPI^{FY10+N-1}_{outturn}) \times ... \times (1+CPI^{FY09}_{outturn})$

7. Annual price change (continued)

Schedule	Description of price/charge in the year 1 of the regulatory control period	Calculation of price/charges in years 2 to 5 of the regulatory control period
4. Residual value for early replacement (pre-July 2009) assets.	We propose that the control mechanism be a schedule of formula for each asset. This allows EnergyAustralia and the customer easily calculate the residual value of assets based on their remaining life, the number of assets being replaced and outturn CPI. Given the financial valuation approach under a roll forward, the remaining life of the assets should be the remaining life contained in the RAB roll forward model.	The formula should include the outturn inflation as part of the function, thereby removing the need to perform an annual adjustment.

Schedules

List of Schedules

Schedule 1:	Fixed capital charges for assets constructed prior to July 2009 [CONFIDENTIAL]
Schedule 2:	Residual capital value for assets constructed prior to July 2009
Schedule 3:	Capital prices for assets constructed after June 2009
Schedule 4:	Maintenance prices for all assets

Schedule 1 – Fixed capital charges for assets constructed prior to July 2009

[CONFIDENTIAL]

Schedule 2 – Annuity capital charges for assets constructed after June 2009 ($ Real FY10)

Asset type	FY10	FY11	FY12	FY13	FY14
Bracket - 0.5	$21.76	$22.80	$24.23	$26.01	$28.02
Bracket - 0.6	$21.76	$22.80	$24.23	$26.01	$28.02
Bracket - 1.0	$20.98	$21.98	$23.36	$25.07	$27.01
Bracket - 1.2	$20.98	$21.98	$23.36	$25.07	$27.01
Bracket - 1.5	$70.07	$73.40	$78.00	$83.73	$90.21
Bracket - 2.0	$25.89	$27.12	$28.82	$30.94	$33.33
Bracket - 2.5	$33.37	$34.96	$37.15	$39.88	$42.96
Bracket - 3.0	$48.10	$50.38	$53.54	$57.48	$61.92
Bracket - 3.5	$50.33	$52.72	$56.02	$60.14	$64.79
Bracket - 4.0	$50.33	$52.72	$56.02	$60.14	$64.79
Bracket - 4.5	$56.57	$59.26	$62.98	$67.61	$72.84
Bracket - 5.0	$54.57	$57.16	$60.74	$65.21	$70.25
Bracket - 6.0	$72.41	$75.86	$80.61	$86.54	$93.23
Bracket - 6.5	$72.41	$75.86	$80.61	$86.54	$93.23
Bracket - 7.0	$72.41	$75.86	$80.61	$86.54	$93.23
Bracket - 8.0	$72.41	$75.86	$80.61	$86.54	$93.23
Luminaire - 1x40W TF	$13.13	$13.75	$14.61	$15.69	$16.90
Luminaire - 1x80W TF	$10.63	$11.14	$11.84	$12.71	$13.69
Luminaire - 1000W MBF	$34.84	$36.50	$38.79	$41.64	$44.86
Luminaire - 1000W SON	$181.96	$190.62	$202.56	$217.45	$234.27
Luminaire - 1000W SON FLOODLIGHT	$95.55	$100.10	$106.37	$114.19	$123.02
Luminaire - 1000W/1500W MBI FLOODLIG	$138.35	$144.94	$154.02	$165.34	$178.13
Luminaire - 100W MBI	$30.23	$31.66	$33.65	$36.12	$38.92
Luminaire - 100W MBI FLOODLIGHT	$34.84	$36.50	$38.79	$41.64	$44.86
Luminaire - 100W SON	$26.17	$27.42	$29.14	$31.28	$33.70
Luminaire - 100W SON - PARKVILLE	$135.56	$142.00	$150.90	$161.99	$174.53
Luminaire - 100W SON FLOODLIGHT	$61.56	$64.49	$68.53	$73.57	$79.26
Luminaire - 100W SON -PLAIN	$26.17	$27.42	$29.14	$31.28	$33.70
Luminaire - 125W MBF	$14.17	$14.84	$15.77	$16.93	$18.24
Luminaire - 125W MBF - BOURKE HILL	$93.03	$97.46	$103.56	$111.18	$119.78
Luminaire - 125W MBF - HYDE PARK	$65.90	$69.03	$73.36	$78.75	$84.84
Luminaire - 125W MBF - NOSTALGIA	$95.32	$99.86	$106.11	$113.91	$122.73
Luminaire - 125W MBF - PARKVILLE	$121.72	$127.51	$135.50	$145.45	$156.71
Luminaire - 125W MBF BOLLARD	$55.73	$58.39	$62.04	$66.60	$71.76
Luminaire - 125W MBF -PLAIN	$14.17	$14.84	$15.77	$16.93	$18.24
Luminaire - 125W/250W MBF FLOODLIGHT	$31.76	$33.27	$35.35	$37.95	$40.89
Luminaire - 135W SOX	$37.92	$39.72	$42.21	$45.31	$48.82
Luminaire - 150W SON	$25.37	$26.58	$28.24	$30.32	$32.66
Luminaire - 150W SON - HYDE PARK	$65.90	$69.03	$73.36	$78.75	$84.84
Luminaire - 150W SON - PARKVILLE	$135.56	$142.00	$150.90	$161.99	$174.53
Luminaire - 150W SON - PARKWAY 1	$45.84	$48.02	$51.03	$54.78	$59.01
Luminaire - 150W SON FLOODLIGHT	$61.56	$64.49	$68.53	$73.57	$79.26
Luminaire - 150W SON GEC 'BOSTON 3'	$121.72	$127.51	$135.50	$145.45	$156.71
Luminaire - 150W/250W MBI FLOODLIGHT	$81.84	$85.74	$91.11	$97.80	$105.37
Luminaire - 180W SOX	$44.91	$47.05	$50.00	$53.67	$57.83
Luminaire - 2x14W TF - T5 PIERLITE M	$29.61	$31.02	$32.96	$35.39	$38.13
Luminaire - 2x175W MBF - PARKWAY 2	$153.46	$160.76	$170.83	$183.39	$197.58
Luminaire - 2x20W TF	$13.03	$13.65	$14.50	$15.57	$16.77
Luminaire - 2x20W TF - WAVERLEY	$13.03	$13.65	$14.50	$15.57	$16.77

Asset type	FY10	FY11	FY12	FY13	FY14
Luminaire - 2x250W SON FLOODLIGHT	$72.89	$76.36	$81.14	$87.11	$93.84
Luminaire - 2x26W TF MACQUARIE DEC.	$122.82	$128.67	$136.73	$146.78	$158.13
Luminaire - 2x400W MBF - PARKWAY 2	$153.46	$160.76	$170.83	$183.39	$197.58
Luminaire - 2x400W MBI FLOODLIGHT	$156.12	$163.55	$173.79	$186.57	$201.00
Luminaire - 2x400W SON FLOODLIGHT	$170.39	$178.49	$189.68	$203.62	$219.37
Luminaire - 2x40W TF	$29.94	$31.37	$33.33	$35.78	$38.55
Luminaire - 2x70W SON - BOURKE HILL	$173.52	$181.77	$193.16	$207.36	$223.40
Luminaire - 2x80W MBF - BOURKE HILL	$77.84	$81.55	$86.66	$93.03	$100.22
Luminaire - 250W MBF	$24.33	$25.48	$27.08	$29.07	$31.32
Luminaire - 250W MBF - PARKVILLE	$125.48	$131.45	$139.69	$149.96	$161.56
Luminaire - 250W MBF - PARKWAY 1	$45.84	$48.02	$51.03	$54.78	$59.01
Luminaire - 250W MBI - SMARTPOLE	$2.95	$3.09	$3.28	$3.52	$3.80
Luminaire - 250W SON	$23.83	$24.96	$26.53	$28.48	$30.68
Luminaire - 250W SON - PARKVILLE	$148.42	$155.49	$165.23	$177.37	$191.09
Luminaire - 250W SON - PARKWAY 1	$45.84	$48.02	$51.03	$54.78	$59.01
Luminaire - 250W SON FLOODLIGHT	$54.88	$57.49	$61.10	$65.59	$70.66
Luminaire - 250W SON GEC 'BOSTON 3'	$124.51	$130.43	$138.60	$148.79	$160.30
Support - 2ND LIGHT NON-TRL	$0.00	$0.00	$0.00	$0.00	$0.00
Support - 2ND LIGHT TRL	$0.00	$0.00	$0.00	$0.00	$0.00
Luminaire - 2X14W TF - T5 PIERLIGHT	$19.90	$20.85	$22.15	$23.78	$25.62
Luminaire - 3x400W MBF - PARKWAY 3	$153.46	$160.76	$170.83	$183.39	$197.58
Luminaire - 4x1000W MBF	$130.52	$136.73	$145.30	$155.98	$168.04
Luminaire - 4x20W TF	$57.81	$60.56	$64.35	$69.08	$74.42
Luminaire - 4x20W TF - WAVERLEY	$57.81	$60.56	$64.35	$69.08	$74.42
Luminaire - 4x250W SON	$85.20	$89.25	$94.84	$101.82	$109.69
Luminaire - 4x40W TF	$71.91	$75.33	$80.05	$85.93	$92.58
Luminaire - 4x40W TF - WAVERLEY	$65.52	$68.64	$72.94	$78.30	$84.36
Luminaire - 4x600W SON	$142.83	$149.62	$159.00	$170.69	$183.89
Luminaire - 400W MBF	$33.07	$34.64	$36.81	$39.52	$42.57
Luminaire - 400W MBF - PARKWAY 1	$72.89	$76.36	$81.14	$87.11	$93.84
Luminaire - 400W MBF FLOODLIGHT	$82.68	$86.61	$92.04	$98.81	$106.45
Luminaire - 400W MBI - SMARTPOLE	$2.95	$3.09	$3.28	$3.52	$3.80
Luminaire - 400W MBI FLOODLIGHT	$56.10	$58.77	$62.46	$67.05	$72.23
Luminaire - 400W SON	$33.13	$34.71	$36.88	$39.59	$42.65
Luminaire - 400W SON - PARKWAY 1	$45.84	$48.02	$51.03	$54.78	$59.01
Luminaire - 400W SON FLOODLIGHT	$66.65	$69.83	$74.20	$79.65	$85.82
Luminaire - 40W SOX	$13.13	$13.75	$14.61	$15.69	$16.90
Luminaire - 42W MBF SYLVANIA SUB ECO	$24.73	$25.91	$27.53	$29.55	$31.84
Luminaire - 500W MBI FLOODLIGHT	$77.92	$81.63	$86.75	$93.12	$100.33
Luminaire - 50W MBF	$13.18	$13.81	$14.68	$15.75	$16.97
Luminaire - 50W MBF - BOURKE HILL	$13.18	$13.81	$14.68	$15.75	$16.97
Luminaire - 50W MBF - NOSTALGIA	$77.84	$81.55	$86.66	$93.03	$100.22
Luminaire - 50W MBF - PLAIN	$76.24	$79.87	$84.87	$91.11	$98.16
Luminaire - 50W MBF BOLLARD	$42.53	$44.55	$47.35	$50.83	$54.76
Luminaire - 50W SON	$12.79	$13.40	$14.23	$15.28	$16.46
Luminaire - 50W SON - BOURKE HILL	$89.25	$93.50	$99.36	$106.66	$114.91
Luminaire - 50W SON - NOSTALGIA	$30.34	$31.78	$33.77	$36.25	$39.06
Luminaire - 60W SOX	$13.13	$13.75	$14.61	$15.69	$16.90
Luminaire - 700W MBF	$37.66	$39.45	$41.92	$45.00	$48.48
Luminaire - 70W MBI	$21.97	$23.01	$24.46	$26.25	$28.28
Luminaire - 70W MBI - MACQUARIE DEC.	$139.05	$145.67	$154.80	$166.17	$179.03
Luminaire - 70W SON	$12.92	$13.53	$14.38	$15.44	$16.63
Luminaire - 70W SON - BOURKE HILL	$89.25	$93.50	$99.36	$106.66	$114.91

Asset type	FY10	FY11	FY12	FY13	FY14
Luminaire - 70W SON - GEC BOSTON 2	$107.54	$112.65	$119.71	$128.51	$138.45
Luminaire - 70W SON - NOSTALGIA	$81.98	$85.88	$91.26	$97.97	$105.55
Luminaire - 70W SON - PARKVILLE	$107.54	$112.65	$119.71	$128.51	$138.45
Luminaire - 70W SON - REGAL/FLINDERS	$159.33	$166.91	$177.37	$190.41	$205.14
Luminaire - 70W SON BOLLARD	$58.20	$60.97	$64.79	$69.55	$74.93
Luminaire - 70W SON FLOODLIGHT	$24.33	$25.48	$27.08	$29.07	$31.32
Luminaire - 70W SON -PLAIN	$12.92	$13.53	$14.38	$15.44	$16.63
Luminaire - 750W MBI FLOODLIGHT	$77.92	$81.63	$86.75	$93.12	$100.33
Luminaire - 80W MBF	$12.34	$12.93	$13.74	$14.74	$15.89
Luminaire - 80W MBF - PLAIN	$12.34	$12.93	$13.74	$14.74	$15.89
Luminaire - 80W MBF - BEGA+CURVE BRA	$138.91	$145.52	$154.64	$166.00	$178.84
Luminaire - 80W MBF - BOURKE HILL	$55.26	$57.89	$61.52	$66.04	$71.15
Luminaire - 80W MBF - GEC BOSTON 2	$107.54	$112.65	$119.71	$128.51	$138.45
Luminaire - 80W MBF - NOSTALGIA	$76.24	$79.87	$84.87	$91.11	$98.16
Luminaire - 80W MBF - REGAL/FLINDERS	$153.04	$160.32	$170.36	$182.88	$197.03
Luminaire - 80W MBF - SYLVANIA SUBUR	$12.53	$13.12	$13.95	$14.97	$16.13
Luminaire - 80W MBF BOLLARD	$42.53	$44.55	$47.35	$50.83	$54.76
Luminaire - 80W MBF TOORAK	$67.95	$71.18	$75.64	$81.20	$87.48
Luminaire - 90W SOX	$58.90	$61.70	$65.57	$70.39	$75.83
Support - BOLLARD	$133.37	$139.71	$148.47	$159.38	$171.71
Bracket - C4	$93.39	$97.83	$103.96	$111.60	$120.23
Support - COLUMN 10.5M-13.5M	$260.16	$272.54	$289.61	$310.90	$334.95
Support - COLUMN 14M-15M	$239.13	$250.51	$266.20	$285.77	$307.88
Support - COLUMN 2.5M-3.5M	$209.46	$219.42	$233.17	$250.31	$269.67
Support - COLUMN 4-6.5M ORION WATE	$227.31	$238.12	$253.04	$271.64	$292.65
Support - COLUMN 4M-6.5M	$256.09	$268.27	$285.08	$306.03	$329.71
Support - COLUMN 7M-10M	$249.00	$260.85	$277.19	$297.57	$320.59
Support - DECORATIVE COLUMN	$274.61	$287.67	$305.69	$328.16	$353.55
Support - DEDICATED SUPPORT & COND	$222.17	$232.74	$247.33	$265.50	$286.04
Support - HYDE PARK STANDARD	$341.76	$358.02	$380.46	$408.42	$440.01
Lamp - INC1x100	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x1000	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x1440	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x150	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x200	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x300	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x40	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x500	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x60	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC1x75	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - INC3x100	$0.00	$0.00	$0.00	$0.00	$0.00
Luminaire - INCANDESCENT	$6.16	$6.46	$6.86	$7.36	$7.93
Support - MACQUARIE STANDARD	$57.79	$60.54	$64.33	$69.06	$74.40
Support - MAST 15.5M-30M	$250.96	$262.89	$279.37	$299.90	$323.10
Support - MAST 23M	$250.96	$262.89	$279.37	$299.90	$323.10
Support - MAST 25M	$250.96	$262.89	$279.37	$299.90	$323.10
Lamp - MBF1x1000	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x125	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x250	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x42	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x50	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x500	$0.00	$0.00	$0.00	$0.00	$0.00

Asset type	FY10	FY11	FY12	FY13	FY14
Lamp - MBF1x700	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x800	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF2x125	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF2x160	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF2x175	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF2x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF2x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF3x160	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF3x250	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF3x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF3x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF4x1000	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF4x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF6x125	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF6x160	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF9x160	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x100	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x1000	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x150	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x1500	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x250	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x3745	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x500	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x70	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI1x750	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI2x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBI4x150	$0.00	$0.00	$0.00	$0.00	$0.00
Bracket - NIL	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - O/U	$10.47	$10.97	$11.66	$12.52	$13.48
Connection - OH	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - OH2	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - OHS	$0.00	$0.00	$0.00	$0.00	$0.00
Support - ORION DOUBLE ARM	$39.24	$41.11	$43.69	$46.90	$50.52
Support - POLO 10.5M DECORATIVE 2M	$78.09	$81.81	$86.93	$93.32	$100.54
Support - POLO 4.5M DECORATIVE 1.2	$78.09	$81.81	$86.93	$93.32	$100.54
Support - PRIVATE	$0.00	$0.00	$0.00	$0.00	$0.00
Support - ROCKS STANDARD	$199.47	$208.96	$222.05	$238.37	$256.81
Support - SMARTPOLE A	$0.00	$0.00	$0.00	$0.00	$0.00
Support - SMARTPOLE AB	$0.00	$0.00	$0.00	$0.00	$0.00
Support - SMARTPOLE B	$0.00	$0.00	$0.00	$0.00	$0.00
Support - SMARTPOLE C	$0.00	$0.00	$0.00	$0.00	$0.00
Bracket - SMARTPOLE DOUBLE	$14.96	$15.67	$16.65	$17.88	$19.26
Bracket - SMARTPOLE SINGLE LONG	$14.96	$15.67	$16.65	$17.88	$19.26
Bracket - SMARTPOLE SINGLE SHORT	$14.96	$15.67	$16.65	$17.88	$19.26
Lamp - SON1x100	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x1000	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x120	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x150	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x220	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x250	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x310	$0.00	$0.00	$0.00	$0.00	$0.00

Asset type	FY10	FY11	FY12	FY13	FY14
Lamp - SON1x360	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x50	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON1x70	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON2x250	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON2x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON2x70	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON3x70	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON4x250	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON4x600	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON4x70	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SON8x70	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SOX1x135	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SOX1x150	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SOX1x180	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - SOX1x90	$0.00	$0.00	$0.00	$0.00	$0.00
Bracket - SUSPENDED	$57.64	$60.38	$64.16	$68.88	$74.21
Bracket - T1	$33.09	$34.66	$36.83	$39.54	$42.60
Bracket - T2	$53.90	$56.46	$60.00	$64.41	$69.39
Bracket - T2A	$53.90	$56.46	$60.00	$64.41	$69.39
Bracket - T3	$54.57	$57.16	$60.74	$65.21	$70.25
Bracket - T3A	$54.57	$57.16	$60.74	$65.21	$70.25
Bracket - T4	$52.56	$55.06	$58.51	$62.81	$67.67
Bracket - T5	$52.56	$55.06	$58.51	$62.81	$67.67
Bracket - T6	$72.41	$75.86	$80.61	$86.54	$93.23
Bracket - T7	$66.73	$69.90	$74.28	$79.74	$85.91
Lamp - TF1x16	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF1x176	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF1x20	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF1x236	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF1x26	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF1x40	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF1x60	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF1x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF2x14 T5	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF2x20	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF2x26	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF2x40	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF2x58	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF2x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF3x20	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF3x40	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF3x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF4x20	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF4x40	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF4x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF5x58	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF5x65	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF5x80	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF6x20	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF6x36	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TF6x80	$0.00	$0.00	$0.00	$0.00	$0.00
Luminaire - TH FLOODLIGHT	$150.94	$158.12	$168.03	$180.38	$194.34

Asset type	FY10	FY11	FY12	FY13	FY14
Lamp - TH1x1000	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TH1x1500	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TH1x400	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TH1x500	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - TH1x750	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - UG2	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - UGORDA	$10.47	$10.97	$11.66	$12.52	$13.48
Connection - UGR1	$14.53	$15.23	$16.18	$17.37	$18.71
Connection - UGR2	$10.47	$10.97	$11.66	$12.52	$13.48
Connection - UGS	$10.47	$10.97	$11.66	$12.52	$13.48
Connection - UG-SP	$0.00	$0.00	$0.00	$0.00	$0.00
Support - UNKNOWN	$0.00	$0.00	$0.00	$0.00	$0.00
Support - WALL	$0.00	$0.00	$0.00	$0.00	$0.00
Support - WOOD POLE NON-TRL	$0.00	$0.00	$0.00	$0.00	$0.00
Support - WOOD POLE TRL	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - EMPTY	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - EMPTY	$0.00	$0.00	$0.00	$0.00	$0.00
Luminaire - EMPTY	$1.97	$2.06	$2.19	$2.35	$2.53
Support - EMPTY	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - MBF1x160	$0.00	$0.00	$0.00	$0.00	$0.00
Bracket - PRIVATE	$14.96	$15.67	$16.65	$17.88	$19.26
Luminaire - PRIVATE	$1.97	$2.06	$2.19	$2.35	$2.53
Support - SUSPENDED	$0.00	$0.00	$0.00	$0.00	$0.00

Schedule 3 – Maintenance charges for all assets subject to maintenance program($ real FY10)

Asset type	FY10	FY11	FY12	FY13	FY14
Connection - EMPTY	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - OU	$81.32	$83.34	$85.40	$87.51	$89.68
Connection - OH	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - OH2	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - OHS	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - UG2	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - UGORDA	$40.66	$41.67	$42.70	$43.76	$44.84
Connection - UGR1	$74.55	$76.39	$78.28	$80.22	$82.21
Connection - UGR2	$27.11	$27.78	$28.47	$29.17	$29.89
Connection - UGS	$0.00	$0.00	$0.00	$0.00	$0.00
Connection - UGSP	$0.00	$0.00	$0.00	$0.00	$0.00
Lamp - EMPTY	$39.37	$39.78	$40.15	$41.22	$42.27
Lamp - INC1x100	$306.64	$320.28	$332.27	$344.06	$353.88
Lamp - INC1x1000	$538.98	$561.71	$582.03	$601.77	$618.63
Lamp - INC1x1440	$305.30	$318.86	$330.77	$342.52	$352.30
Lamp - INC1x150	$310.83	$324.52	$336.57	$348.46	$358.40
Lamp - INC1x200	$312.60	$326.34	$338.43	$350.37	$360.35
Lamp - INC1x300	$332.92	$347.16	$359.78	$372.24	$382.76
Lamp - INC1x40	$306.73	$320.37	$332.37	$344.16	$353.98
Lamp - INC1x500	$364.49	$379.51	$392.93	$406.21	$417.58
Lamp - INC1x60	$306.64	$320.28	$332.27	$344.06	$353.88
Lamp - INC1x75	$306.64	$320.28	$332.27	$344.06	$353.88
Lamp - INC3x100	$333.47	$347.78	$360.45	$372.94	$383.48
Lamp - MBF1x1000	$115.58	$118.67	$121.54	$125.07	$128.35
Lamp - MBF1x125	$56.25	$57.43	$58.49	$60.21	$61.80
Lamp - MBF1x160	$43.71	$44.17	$44.60	$45.79	$46.95
Lamp - MBF1x250	$54.42	$55.38	$56.26	$57.86	$59.37
Lamp - MBF1x400	$53.94	$54.87	$55.72	$57.29	$58.78
Lamp - MBF1x42	$52.33	$53.31	$54.20	$55.76	$57.22
Lamp - MBF1x50	$43.17	$43.74	$44.25	$45.47	$46.63
Lamp - MBF1x500	$143.91	$148.31	$152.34	$156.96	$161.15
Lamp - MBF1x700	$83.32	$85.30	$87.13	$89.65	$92.00
Lamp - MBF1x80	$46.71	$47.46	$48.13	$49.48	$50.77
Lamp - MBF1x800	$143.91	$148.31	$152.34	$156.96	$161.15
Lamp - MBF2x125	$68.79	$70.57	$72.17	$74.37	$76.37
Lamp - MBF2x160	$67.30	$68.99	$70.50	$72.67	$74.62
Lamp - MBF2x175	$179.19	$183.66	$188.00	$193.07	$198.01
Lamp - MBF2x400	$76.27	$78.19	$79.93	$82.33	$84.52
Lamp - MBF2x80	$60.48	$61.79	$62.98	$64.82	$66.53
Lamp - MBF3x160	$67.30	$68.99	$70.50	$72.67	$74.62

Asset type	FY10	FY11	FY12	FY13	FY14
Lamp - MBF3x250	$103.19	$105.77	$108.19	$111.29	$114.20
Lamp - MBF3x400	$107.70	$110.39	$112.92	$116.14	$119.17
Lamp - MBF3x80	$66.35	$67.81	$69.14	$71.14	$73.00
Lamp - MBF4x1000	$1,224.61	$1,255.14	$1,286.13	$1,318.49	$1,351.31
Lamp - MBF4x80	$75.49	$77.18	$78.75	$80.98	$83.08
Lamp - MBF6x125	$130.44	$133.70	$136.81	$140.62	$144.25
Lamp - MBF6x160	$67.30	$68.99	$70.50	$72.67	$74.62
Lamp - MBF9x160	$67.30	$68.99	$70.50	$72.67	$74.62
Lamp - MBI1x100	$84.71	$86.96	$89.01	$91.68	$94.12
Lamp - MBI1x1000	$189.46	$195.13	$200.44	$206.32	$211.77
Lamp - MBI1x150	$112.20	$114.94	$117.53	$120.83	$123.96
Lamp - MBI1x1500	$162.06	$167.06	$171.67	$176.84	$181.56
Lamp - MBI1x250	$72.89	$74.52	$76.01	$78.21	$80.26
Lamp - MBI1x3745	$105.36	$108.95	$112.12	$115.82	$119.03
Lamp - MBI1x400	$69.75	$71.20	$72.55	$74.61	$76.56
Lamp - MBI1x500	$146.61	$151.23	$155.44	$160.21	$164.52
Lamp - MBI1x70	$88.27	$90.65	$92.83	$95.61	$98.15
Lamp - MBI2x400	$162.32	$166.94	$171.28	$176.24	$180.87
Lamp - MBI4x150	$90.13	$92.97	$95.47	$98.56	$101.27
Lamp - SON1x100	$66.76	$68.15	$69.44	$71.43	$73.29
Lamp - SON1x1000	$112.71	$115.68	$118.45	$121.88	$125.08
Lamp - SON1x120	$96.28	$99.32	$102.03	$105.28	$108.15
Lamp - SON1x150	$63.12	$64.43	$65.61	$67.50	$69.27
Lamp - SON1x220	$110.87	$114.22	$117.25	$120.88	$124.13
Lamp - SON1x250	$64.97	$66.38	$67.67	$69.65	$71.48
Lamp - SON1x310	$109.67	$112.99	$115.99	$119.59	$122.81
Lamp - SON1x360	$90.13	$92.97	$95.47	$98.56	$101.27
Lamp - SON1x400	$67.59	$69.13	$70.51	$72.59	$74.51
Lamp - SON1x50	$51.37	$52.22	$53.00	$54.46	$55.87
Lamp - SON1x70	$52.85	$53.74	$54.57	$56.08	$57.53
Lamp - SON2x250	$90.67	$92.85	$94.88	$97.60	$100.16
Lamp - SON2x400	$92.65	$94.88	$96.96	$99.73	$102.33
Lamp - SON2x70	$97.30	$99.72	$101.98	$104.88	$107.62
Lamp - SON3x70	$141.17	$144.67	$148.04	$152.09	$155.99
Lamp - SON4x250	$172.23	$176.43	$180.52	$185.36	$190.09
Lamp - SON4x600	$512.30	$525.82	$539.20	$553.39	$567.39
Lamp - SON4x70	$202.58	$207.60	$212.53	$218.17	$223.71
Lamp - SON8x70	$623.70	$639.14	$654.75	$671.34	$688.10
Lamp - SOX1x135	$59.02	$60.04	$60.98	$62.66	$64.28
Lamp - SOX1x150	$114.36	$118.02	$121.31	$125.15	$128.56
Lamp - SOX1x180	$198.03	$203.76	$209.17	$215.19	$220.83
Lamp - SOX1x90	$95.39	$98.20	$100.74	$103.85	$106.65
Lamp - TF1x16	$130.72	$135.68	$140.05	$144.80	$148.86

Asset type	FY10	FY11	FY12	FY13	FY14
Lamp - TF1x176	$181.49	$188.88	$195.37	$202.14	$207.85
Lamp - TF1x20	$131.53	$136.51	$140.90	$145.67	$149.75
Lamp - TF1x236	$181.49	$188.88	$195.37	$202.14	$207.85
Lamp - TF1x26	$131.61	$136.59	$140.98	$145.76	$149.84
Lamp - TF1x40	$131.68	$136.67	$141.06	$145.83	$149.92
Lamp - TF1x60	$132.45	$137.46	$141.87	$146.66	$150.77
Lamp - TF1x80	$132.45	$137.46	$141.87	$146.66	$150.77
Lamp - TF2x14 T5	$52.11	$52.96	$53.75	$55.22	$56.65
Lamp - TF2x20	$69.35	$71.20	$72.85	$75.10	$77.12
Lamp - TF2x26	$134.26	$139.30	$143.76	$148.60	$152.76
Lamp - TF2x40	$134.56	$139.61	$144.08	$148.93	$153.09
Lamp - TF2x58	$130.72	$135.68	$140.05	$144.80	$148.86
Lamp - TF2x80	$137.64	$142.77	$147.31	$152.25	$156.49
Lamp - TF3x20	$138.00	$143.14	$147.69	$152.63	$156.88
Lamp - TF3x40	$139.35	$144.52	$149.11	$154.09	$158.37
Lamp - TF3x80	$146.29	$151.63	$156.39	$161.55	$166.02
Lamp - TF4x20	$143.66	$148.93	$153.63	$158.72	$163.12
Lamp - TF4x40	$146.06	$151.40	$156.16	$161.31	$165.77
Lamp - TF4x80	$158.39	$164.03	$169.10	$174.57	$179.37
Lamp - TF5x58	$130.72	$135.68	$140.05	$144.80	$148.86
Lamp - TF5x65	$130.72	$135.68	$140.05	$144.80	$148.86
Lamp - TF5x80	$173.95	$179.98	$185.45	$191.32	$196.53
Lamp - TF6x20	$159.82	$165.50	$170.60	$176.11	$180.94
Lamp - TF6x36	$165.23	$171.05	$176.29	$181.94	$186.91
Lamp - TF6x80	$192.97	$199.47	$205.42	$211.79	$217.50
Lamp - TH1x1000	$98.29	$101.25	$103.90	$107.16	$110.06
Lamp - TH1x1500	$96.01	$98.92	$101.52	$104.71	$107.56
Lamp - TH1x400	$104.36	$107.48	$110.29	$113.70	$116.76
Lamp - TH1x500	$91.89	$94.69	$97.18	$100.27	$103.01
Lamp - TH1x750	$99.09	$102.07	$104.74	$108.02	$110.94

Schedule 4 – Residual value for pre-July 2009 assets ($ real FY09)

Asset type	"N/A" denotes that these assets have no residual value
Bracket - 0.5	= 10.2136 x qty of assets x remaining life
Bracket - 0.6	= 10.2136 x qty of assets x remaining life
Bracket - 1.0	= 9.0415 x qty of assets x remaining life
Bracket - 1.2	= 9.0415 x qty of assets x remaining life
Bracket - 1.5	= 82.7131 x qty of assets x remaining life
Bracket - 2.0	= 16.4087 x qty of assets x remaining life
Bracket - 2.5	= 16.4087 x qty of assets x remaining life
Bracket - 3.0	= 38.5101 x qty of assets x remaining life
Bracket - 3.5	= 41.8588 x qty of assets x remaining life
Bracket - 4.0	= 41.8588 x qty of assets x remaining life
Bracket - 4.5	= 51.2352 x qty of assets x remaining life
Bracket - 5.0	= 48.2214 x qty of assets x remaining life
Bracket - 6.0	= 75.011 x qty of assets x remaining life
Bracket - 6.5	= 75.011 x qty of assets x remaining life
Bracket - 7.0	= 75.011 x qty of assets x remaining life
Bracket - 8.0	= 75.011 x qty of assets x remaining life
Luminaire - 1x40W TF	= 14.163 x qty of assets x remaining life
Luminaire - 1x80W TF	= 10.995 x qty of assets x remaining life
Luminaire - 1000W MBF	= 40.4658 x qty of assets x remaining life
Luminaire - 1000W SON	= 227.1319 x qty of assets x remaining life
Luminaire - 1000W SON FLOODLIGHT	= 117.4928 x qty of assets x remaining life
Luminaire - 1000W/1500W MBI FLOODLIG	= 171.8021 x qty of assets x remaining life
Luminaire - 100W MBI	= 34.6089 x qty of assets x remaining life
Luminaire - 100W MBI FLOODLIGHT	= 40.4658 x qty of assets x remaining life
Luminaire - 100W SON	= 29.4686 x qty of assets x remaining life
Luminaire - 100W SON - PARKVILLE	= 168.2525 x qty of assets x remaining life
Luminaire - 100W SON FLOODLIGHT	= 74.3647 x qty of assets x remaining life
Luminaire - 100W SON -PLAIN	= 29.4686 x qty of assets x remaining life
Luminaire - 125W MBF	= 14.232 x qty of assets x remaining life
Luminaire - 125W MBF - BOURKE HILL	= 114.2981 x qty of assets x remaining life
Luminaire - 125W MBF - HYDE PARK	= 79.8667 x qty of assets x remaining life
Luminaire - 125W MBF - NOSTALGIA	= 117.2048 x qty of assets x remaining life
Luminaire - 125W MBF - PARKVILLE	= 150.6918 x qty of assets x remaining life
Luminaire - 125W MBF BOLLARD	= 66.9742 x qty of assets x remaining life
Luminaire - 125W MBF -PLAIN	= 14.232 x qty of assets x remaining life
Luminaire - 125W/250W MBF FLOODLIGHT	= 36.5523 x qty of assets x remaining life
Luminaire - 135W SOX	= 44.3704 x qty of assets x remaining life
Luminaire - 150W SON	= 28.4473 x qty of assets x remaining life
Luminaire - 150W SON - HYDE PARK	= 79.8667 x qty of assets x remaining life
Luminaire - 150W SON - PARKVILLE	= 168.2525 x qty of assets x remaining life
Luminaire - 150W SON - PARKWAY 1	= 54.4165 x qty of assets x remaining life
Luminaire - 150W SON FLOODLIGHT	= 74.3647 x qty of assets x remaining life

Asset type	"N/A" denotes that these assets have no residual value
Luminaire - 150W SON GEC 'BOSTON 3'	= 150.6918 x qty of assets x remaining life
Luminaire - 150W/250W MBI FLOODLIGHT	N/A
Luminaire - 180W SOX	= 53.2444 x qty of assets x remaining life
Luminaire - 2x14W TF - T5 PIERLITE M	= 35.0777 x qty of assets x remaining life
Luminaire - 2x175W MBF - PARKWAY 2	= 190.9701 x qty of assets x remaining life
Luminaire - 2x20W TF	= 14.0328 x qty of assets x remaining life
Luminaire - 2x20W TF - WAVERLEY	= 14.0328 x qty of assets x remaining life
Luminaire - 2x250W SON FLOODLIGHT	= 88.7407 x qty of assets x remaining life
Luminaire - 2x26W TF MACQUARIE DEC.	= 153.344 x qty of assets x remaining life
Luminaire - 2x400W MBF - PARKWAY 2	= 190.9701 x qty of assets x remaining life
Luminaire - 2x400W MBI FLOODLIGHT	= 194.3422 x qty of assets x remaining life
Luminaire - 2x400W SON FLOODLIGHT	= 212.4454 x qty of assets x remaining life
Luminaire - 2x40W TF	= 35.4963 x qty of assets x remaining life
Luminaire - 2x70W SON - BOURKE HILL	N/A
Luminaire - 2x80W MBF - BOURKE HILL	= 96.2753 x qty of assets x remaining life
Luminaire - 250W MBF	= 27.1245 x qty of assets x remaining life
Luminaire - 250W MBF - PARKVILLE	= 155.4738 x qty of assets x remaining life
Luminaire - 250W MBF - PARKWAY 1	= 54.4165 x qty of assets x remaining life
Luminaire - 250W MBI - SMARTPOLE	N/A
Luminaire - 250W SON	= 26.495 x qty of assets x remaining life
Luminaire - 250W SON - PARKVILLE	= 184.5808 x qty of assets x remaining life
Luminaire - 250W SON - PARKWAY 1	= 54.4165 x qty of assets x remaining life
Luminaire - 250W SON FLOODLIGHT	= 65.8942 x qty of assets x remaining life
Luminaire - 250W SON GEC 'BOSTON 3'	= 154.2314 x qty of assets x remaining life
Support - 2ND LIGHT NON-TRL	N/A
Support - 2ND LIGHT TRL	N/A
Luminaire - 2X14W TF - T5 PIERLIGHT	= 22.7568 x qty of assets x remaining life
Luminaire - 3x400W MBF - PARKWAY 3	= 190.9701 x qty of assets x remaining life
Luminaire - 4x1000W MBF	N/A
Luminaire - 4x20W TF	= 70.8506 x qty of assets x remaining life
Luminaire - 4x20W TF - WAVERLEY	= 70.8506 x qty of assets x remaining life
Luminaire - 4x250W SON	= 104.3591 x qty of assets x remaining life
Luminaire - 4x40W TF	= 88.7407 x qty of assets x remaining life
Luminaire - 4x40W TF - WAVERLEY	= 80.6405 x qty of assets x remaining life
Luminaire - 4x600W SON	= 177.4815 x qty of assets x remaining life
Luminaire - 400W MBF	= 38.2155 x qty of assets x remaining life
Luminaire - 400W MBF - PARKWAY 1	= 88.7407 x qty of assets x remaining life
Luminaire - 400W MBF FLOODLIGHT	= 101.1645 x qty of assets x remaining life
Luminaire - 400W MBI - SMARTPOLE	N/A
Luminaire - 400W MBI FLOODLIGHT	= 67.443 x qty of assets x remaining life
Luminaire - 400W SON	= 38.2941 x qty of assets x remaining life
Luminaire - 400W SON - PARKWAY 1	= 54.4165 x qty of assets x remaining life
Luminaire - 400W SON FLOODLIGHT	= 80.8294 x qty of assets x remaining life

Asset type	"N/A" denotes that these assets have no residual value
Luminaire - 40W SOX	= 14.163 x qty of assets x remaining life
Luminaire - 42W MBF SYLVANIA SUB ECO	= 28.8826 x qty of assets x remaining life
Luminaire - 500W MBI FLOODLIGHT	= 95.1301 x qty of assets x remaining life
Luminaire - 50W MBF	= 14.232 x qty of assets x remaining life
Luminaire - 50W MBF - BOURKE HILL	= 14.232 x qty of assets x remaining life
Luminaire - 50W MBF - NOSTALGIA	= 96.2753 x qty of assets x remaining life
Luminaire - 50W MBF - PLAIN	= 94.2427 x qty of assets x remaining life
Luminaire - 50W MBF BOLLARD	= 51.4696 x qty of assets x remaining life
Luminaire - 50W SON	= 13.7297 x qty of assets x remaining life
Luminaire - 50W SON - BOURKE HILL	N/A
Luminaire - 50W SON - NOSTALGIA	= 35.9986 x qty of assets x remaining life
Luminaire - 60W SOX	N/A
Luminaire - 700W MBF	= 44.0355 x qty of assets x remaining life
Luminaire - 70W MBI	= 25.3799 x qty of assets x remaining life
Luminaire - 70W MBI - MACQUARIE DEC.	= 172.6895 x qty of assets x remaining life
Luminaire - 70W SON	= 13.8971 x qty of assets x remaining life
Luminaire - 70W SON - BOURKE HILL	= 110.7485 x qty of assets x remaining life
Luminaire - 70W SON - GEC BOSTON 2	= 133.9483 x qty of assets x remaining life
Luminaire - 70W SON - NOSTALGIA	= 101.5194 x qty of assets x remaining life
Luminaire - 70W SON - PARKVILLE	= 133.9483 x qty of assets x remaining life
Luminaire - 70W SON - REGAL/FLINDERS	= 199.6667 x qty of assets x remaining life
Luminaire - 70W SON BOLLARD	= 71.3476 x qty of assets x remaining life
Luminaire - 70W SON FLOODLIGHT	= 28.3704 x qty of assets x remaining life
Luminaire - 70W SON -PLAIN	= 13.8971 x qty of assets x remaining life
Luminaire - 750W MBI FLOODLIGHT	= 95.1301 x qty of assets x remaining life
Luminaire - 80W MBF	= 13.1604 x qty of assets x remaining life
Luminaire - 80W MBF - PLAIN	= 13.1604 x qty of assets x remaining life
Luminaire - 80W MBF - BEGA+CURVE BRA	= 173.7544 x qty of assets x remaining life
Luminaire - 80W MBF - BOURKE HILL	= 67.6205 x qty of assets x remaining life
Luminaire - 80W MBF - GEC BOSTON 2	= 133.9483 x qty of assets x remaining life
Luminaire - 80W MBF - NOSTALGIA	= 94.2427 x qty of assets x remaining life
Luminaire - 80W MBF - REGAL/FLINDERS	= 191.68 x qty of assets x remaining life
Luminaire - 80W MBF - SYLVANIA SUBUR	= 13.3999 x qty of assets x remaining life
Luminaire - 80W MBF BOLLARD	= 51.4696 x qty of assets x remaining life
Luminaire - 80W MBF TOORAK	= 83.7177 x qty of assets x remaining life
Luminaire - 90W SOX	= 70.9926 x qty of assets x remaining life
Support - BOLLARD	= 41.5814 x qty of assets x remaining life
Bracket - C4	= 106.4889 x qty of assets x remaining life
Support - COLUMN 10.5M-13.5M	= 89.0278 x qty of assets x remaining life
Support - COLUMN 14M-15M	= 70.9926 x qty of assets x remaining life
Support - COLUMN 2.5M-3.5M	N/A
Support - COLUMN 4-6.5M ORION WATE	= 60.8508 x qty of assets x remaining life
Support - COLUMN 4M-6.5M	= 85.5356 x qty of assets x remaining life

Asset type	"N/A" denotes that these assets have no residual value
Support - COLUMN 7M-10M	= 79.46 x qty of assets x remaining life
Support - DECORATIVE COLUMN	= 101.418 x qty of assets x remaining life
Support - DEDICATED SUPPORT & COND	= 56.4496 x qty of assets x remaining life
Support - HYDE PARK STANDARD	= 159.0158 x qty of assets x remaining life
Lamp - INC1x100	N/A
Lamp - INC1x1000	N/A
Lamp - INC1x1440	N/A
Lamp - INC1x150	N/A
Lamp - INC1x200	N/A
Lamp - INC1x300	N/A
Lamp - INC1x40	N/A
Lamp - INC1x500	N/A
Lamp - INC1x60	N/A
Lamp - INC1x75	N/A
Lamp - INC3x100	N/A
Luminaire - INCANDESCENT	= 5.3244 x qty of assets x remaining life
Support - MACQUARIE STANDARD	= 49.5609 x qty of assets x remaining life
Support - MAST 15.5M-30M	= 81.1344 x qty of assets x remaining life
Support - MAST 23M	= 81.1344 x qty of assets x remaining life
Support - MAST 25M	= 81.1344 x qty of assets x remaining life
Lamp - MBF1x1000	N/A
Lamp - MBF1x125	N/A
Lamp - MBF1x250	N/A
Lamp - MBF1x400	N/A
Lamp - MBF1x42	N/A
Lamp - MBF1x50	N/A
Lamp - MBF1x500	N/A
Lamp - MBF1x700	N/A
Lamp - MBF1x80	N/A
Lamp - MBF1x800	N/A
Lamp - MBF2x125	N/A
Lamp - MBF2x160	N/A
Lamp - MBF2x175	N/A
Lamp - MBF2x400	N/A
Lamp - MBF2x80	N/A
Lamp - MBF3x160	N/A
Lamp - MBF3x250	N/A
Lamp - MBF3x400	N/A
Lamp - MBF3x80	N/A
Lamp - MBF4x1000	N/A
Lamp - MBF4x80	N/A
Lamp - MBF6x125	N/A
Lamp - MBF6x160	N/A

Asset type	"N/A" denotes that these assets have no residual value
Lamp - MBF9x160	N/A
Lamp - MBI1x100	N/A
Lamp - MBI1x1000	N/A
Lamp - MBI1x150	N/A
Lamp - MBI1x1500	N/A
Lamp - MBI1x250	N/A
Lamp - MBI1x3745	N/A
Lamp - MBI1x400	N/A
Lamp - MBI1x500	N/A
Lamp - MBI1x70	N/A
Lamp - MBI1x750	N/A
Lamp - MBI2x400	N/A
Lamp - MBI4x150	N/A
Bracket - NIL	N/A
Connection - O/U	= 15.9465 x qty of assets x remaining life
Connection - OH	N/A
Connection - OH2	N/A
Connection - OHS	N/A
Support - ORION DOUBLE ARM	= 33.6564 x qty of assets x remaining life
Support - POLO 10.5M DECORATIVE 2M	= 66.9742 x qty of assets x remaining life
Support - POLO 4.5M DECORATIVE 1.2	= 66.9742 x qty of assets x remaining life
Support - PRIVATE	N/A
Support - ROCKS STANDARD	= 69.478 x qty of assets x remaining life
Support - SMARTPOLE A	N/A
Support - SMARTPOLE AB	N/A
Support - SMARTPOLE B	N/A
Support - SMARTPOLE C	N/A
Bracket - SMARTPOLE DOUBLE	N/A
Bracket - SMARTPOLE SINGLE LONG	N/A
Bracket - SMARTPOLE SINGLE SHORT	N/A
Lamp - SON1x100	N/A
Lamp - SON1x1000	N/A
Lamp - SON1x120	N/A
Lamp - SON1x150	N/A
Lamp - SON1x220	N/A
Lamp - SON1x250	N/A
Lamp - SON1x310	N/A
Lamp - SON1x360	N/A
Lamp - SON1x400	N/A
Lamp - SON1x50	N/A
Lamp - SON1x70	N/A
Lamp - SON2x250	N/A
Lamp - SON2x400	N/A

Asset type	"N/A" denotes that these assets have no residual value
Lamp - SON2x70	N/A
Lamp - SON3x70	N/A
Lamp - SON4x250	N/A
Lamp - SON4x600	N/A
Lamp - SON4x70	N/A
Lamp - SON8x70	N/A
Lamp - SOX1x135	N/A
Lamp - SOX1x150	N/A
Lamp - SOX1x180	N/A
Lamp - SOX1x90	N/A
Bracket - SUSPENDED	= 20.0922 x qty of assets x remaining life
Bracket - T1	= 27.2082 x qty of assets x remaining life
Bracket - T2	= 47.2168 x qty of assets x remaining life
Bracket - T2A	= 47.2168 x qty of assets x remaining life
Bracket - T3	= 48.2214 x qty of assets x remaining life
Bracket - T3A	= 48.2214 x qty of assets x remaining life
Bracket - T4	= 45.2076 x qty of assets x remaining life
Bracket - T5	= 45.2076 x qty of assets x remaining life
Bracket - T6	= 75.011 x qty of assets x remaining life
Bracket - T7	= 66.4718 x qty of assets x remaining life
Lamp - TF1x16	N/A
Lamp - TF1x176	N/A
Lamp - TF1x20	N/A
Lamp - TF1x236	N/A
Lamp - TF1x26	N/A
Lamp - TF1x40	N/A
Lamp - TF1x60	N/A
Lamp - TF1x80	N/A
Lamp - TF2x14 T5	N/A
Lamp - TF2x20	N/A
Lamp - TF2x26	N/A
Lamp - TF2x40	N/A
Lamp - TF2x58	N/A
Lamp - TF2x80	N/A
Lamp - TF3x20	N/A
Lamp - TF3x40	N/A
Lamp - TF3x80	N/A
Lamp - TF4x20	N/A
Lamp - TF4x40	N/A
Lamp - TF4x80	N/A
Lamp - TF5x58	N/A
Lamp - TF5x65	N/A
Lamp - TF5x80	N/A

Asset type	"N/A" denotes that these assets have no residual value
Lamp - TF6x20	N/A
Lamp - TF6x36	N/A
Lamp - TF6x80	N/A
Luminaire - TH FLOODLIGHT	= 187.7754 x qty of assets x remaining life
Lamp - TH1x1000	N/A
Lamp - TH1x1500	N/A
Lamp - TH1x400	N/A
Lamp - TH1x500	N/A
Lamp - TH1x750	N/A
Connection - UG2	N/A
Connection - UGORDA	N/A
Connection - UGR1	= 22.13 x qty of assets x remaining life
Connection - UGR2	= 15.9465 x qty of assets x remaining life
Connection - UGS	= 15.9465 x qty of assets x remaining life
Connection - UG-SP	N/A
Support - UNKNOWN	N/A
Support - WALL	N/A
Support - WOOD POLE NON-TRL	N/A
Support - WOOD POLE TRL	N/A
Connection - EMPTY	N/A
Lamp - EMPTY	N/A
Luminaire - EMPTY	N/A
Support - EMPTY	N/A
Lamp - MBF1x160	N/A
Bracket - PRIVATE	N/A
Luminaire - PRIVATE	N/A
Support - SUSPENDED	N/A

570 George Street
Sydney NSW 2000
Telephone 12 15 35
Facsimile 02 9269 2830

Postal Address:
GPO Box 4009
Sydney NSW 2001

EnergyAustralia offices are open between 8.30am and 5.00pm Monday to Friday
Emergency Services are available 24 hours a day Telephone 13 13 88
Internet Address: www.energy.com.au