

8 July 2005



**Street Lighting**  
improvement  
program

Independent Pricing and Regulatory Tribunal  
PO Box Q290  
QVB Post Office NSW 1230

Dear Members of the Tribunal,

***RE: EnergyAustralia Proposal to Increase Public Lighting Prices by 27% Plus CPI  
– Supplementary SLI Program Submission***

Attached please find a supplementary submission to IPART from the Street Lighting Improvement Program regarding EnergyAustralia's public lighting pricing application. This submission consists of an Excel-based analysis derived from the Essential Service Commission Victoria's detailed public lighting cost model (attached file: SLI Program modification of ESC cost model Jul 05.xls).

We have considered the additional input provided by PB Associates at a presentation to councils on Tuesday 5 July and note that there remains a stark comparison between EnergyAustralia's pricing proposal and the recent Victorian ESC analysis. We also note that there appear to be some material errors in the PB Associates February 2005 submission to IPART regarding this pricing comparison. These are summarised in our main submission, and we request an opportunity to discuss this in greater detail with the Secretariat and IPART's consultant.

As discussed previously with the IPART Secretariat, the ESC posted its draft model and this was used as the basis of our work as the ESC did not post its final model. However, the changes made to the model by the ESC were clearly laid out in the Final Determination. We have therefore updated the draft ESC model to incorporate changes in the Final Determination model. These modifications are shown in the attached in blue with accompanying annotations. The SLI Program also made modifications to the ESC model to represent 100% funding of street lighting by EA. These modifications are shown in green with annotations.

Thank you again for the opportunity to make this submission. The SLI Program would be pleased to answer any questions you have related to the matters raised.

Yours sincerely

Graham Mawer  
Program Manager

**Participating Councils:** Ashfield • Bankstown • Botany Bay • Burwood • Canada Bay  
• Canterbury • Gosford • Hornsby • Hurstville • Kogarah • Ku-ring-gai • Lake Macquarie  
• Lane Cove • Leichhardt • Marrickville • Mosman • Newcastle • North Sydney • Randwick  
• Rockdale • Ryde • Sydney • Strathfield • Sutherland • Warringah • Waverley • Willoughby  
• Woollahra • Wyong

c/o Next Energy  
Lvl 12–220 George St  
Sydney NSW 2000  
Tel: 02 9251 4072

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PO Box Q290  
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Dear Members of the Tribunal,

***RE: EnergyAustralia Proposal to Increase Public Lighting Prices by 27% Plus CPI***

On behalf of the 29 councils participating in the Street Lighting Improvement (SLI) Program, I thank you for the opportunity to make this submission contesting EnergyAustralia's (EA's) proposal to increase prices for public lighting services by 27.3% plus CPI. The participating councils represent about 85% of the public lighting in EA's territory, and have been working jointly to achieve reforms to serious longstanding deficiencies in EA's public lighting services.

There are several issues the SLI Program would like to raise for the Tribunal's consideration. In brief, the SLI Program submits that EA's pricing proposal should be denied, as it is inconsistent with cost analyses, would result in inefficient and non-cost reflective prices, and would be inconsistent with regulatory and energy policy objectives.

Our key concerns are summarised below:

**ESSENTIAL NEED FOR REGULATORY PROTECTION**

1) ***No market alternative for councils.*** Councils need IPART's regulatory protection, as the specific public lighting services in question are not contestable, and councils have no market alternative.

**EA's PROPOSED PRICES OUT OF LINE WITH DETAILED COST ANALYSES**

2) ***Inconsistent with ESC Victoria analyses.*** EA's proposed prices are inconsistent with, and highly inflated relative to, the detailed cost analyses performed by the Essential Services Commission Victoria for its recent public lighting pricing inquiry.

3) ***Inconsistent with analyses by EA's consultant.*** EA's proposed prices are inconsistent with, and inflated relative to, the analyses performed by EA's own 'cost-to-serve' consultant, which assessed the costs of an efficiently provided service, assuming that certain of EA's highly obsolete practices and technologies were remedied.

4) ***Inconsistent with other detailed analyses.*** EA's costing contains further material overstatements in asset valuation, depreciation, and operating expenses due to inclusion of several inappropriate items identified by EA's consultant and/or the SLI Program.

5) ***Would overcharge by nearly \$80 million over coming decade.*** Overall, EA's proposed pricing would overcharge councils by more than \$25 million during the four year proposed pricing period and by \$80 million over the coming decade.

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## **ENDORISING EA'S CLAIMS WOULD BE INCONSISTENT WITH ENERGY AND REGULATORY POLICY**

### **6) *Would impede council investments in greenhouse reductions and standards compliance.***

EA's overstated asset valuation and operating expenses would impede councils' investment in appropriate lighting technology that reduces greenhouse gas emissions and improves compliance with Australian Standards for lighting.

7) ***Would obstruct future council access to contestability.*** EA's overstated asset valuation would obstruct any future efforts of councils to access effective contestability in new public lighting.

8) ***Would reward EA and further punish councils for poor EA practices.*** It would be inappropriate to charge councils for EA's longstanding highly inefficient practices, particularly as councils have had no meaningful say nor do they have recourse to any alternative.

These issues are discussed in more detail in the remainder of the submission.

### **1) *No Market Alternative for Councils***

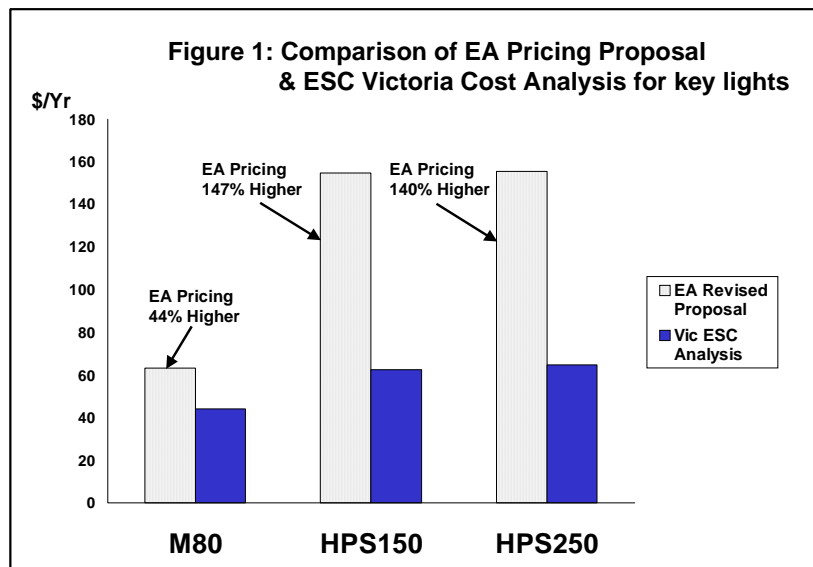
Put simply, Councils have no recourse to a contestable market for public lighting services with respect to the existing 200,000+ lights owned by EA. The SLI Program understands and welcomes the fact that the design, construction and maintenance of *new* public lighting is contestable, as is the supply of retail energy. However, EA's pricing proposal relates to the 200,000+ existing lights currently owned by EA. NSW contestability policy, as established in the Electricity Supply Act 1995 and administered by the Department of Energy, Utilities and Sustainability (DEUS), does not provide for contestability with respect to capital and maintenance charges for existing EA-owned public lighting assets. Furthermore, Councils have no choice with regard to maintenance, modification or removal of these existing lights.

The SLI Program appreciates the Tribunal's efforts to facilitate future contestability by classifying public lighting as an excluded distribution service in the 2004 Electricity Network Price Determination. However, public lighting services related to the EA-owned lights remain a monopoly, and it is therefore essential that councils be provided with clear and strong regulatory protection.

### **2) *Inconsistent with ESC Victoria analyses***

During 2003 and 2004, the Essential Services Commission Victoria (ESC) undertook a rigorous, fully public and iterative review of public lighting charges, which included performing detailed analyses and modelling of public lighting costs. The ESC's detailed analysis investigated the three main lighting types that are also now the defaults for almost all new and replacement lighting in EA's territory. The results of that in depth ESC analysis are summarised in Figure 1 below. The table shows that EA's proposed prices (incorporating a 27.3% real increase requested and excluding consideration of CPI) for these common lighting types are some 44% to 147% above the costs assessed by the ESC.

The SLI Program will provide IPART with an Excel Workbook detailing the cost comparison as a supplement to this submission. The SLI Program requests an opportunity to make a presentation to the Tribunal Secretariat and its consultant on this aspect of its submission and related matters.

**NOTES:**

- 1) Cost comparison based on Vic ESC estimate of bulk & spot O&M including overhead, installed capital costs for brackets and luminaires in urban areas.
- 2) EA costs assume all M80 use residential road brackets and HPS use traffic route brackets.
- 3) For consistency with NSW approach, VIC ESC analysis adjusted to assume all assets are DNSP funded.

Notably, EA's pricing proposal claims that its own internal analysis "indicates that the proposed public lighting prices would be found to be fair and reasonable according to the ESCV criteria." (Section 2.1 p. 7) and, in a supplementary submission to IPART in February 2005 by EA's consultant<sup>1</sup>, it was claimed that "Rates proposed by EnergyAustralia are comparable with ESC rates". These claims are clearly at odds with the above comparison, and the information provided by EA and its consultant has not satisfactorily addressed the key areas of difference underlying these claims. In particular, there appear to be three material issues:

- **Highly Inappropriate to Exclude Consideration of Brackets** – EA's exclusion of bracket costs (including associated labour) from its cost comparison creates significant distortions in the comparison. This is a highly material and inappropriate exclusion given that, unlike ESC Victoria's analysis, EA attributes the great majority (90%) of installation costs to brackets, with only 10% to the luminaires themselves.

The SLI Program notes that, even if EnergyAustralia's capital costs for brackets and luminaires obtained at tender are inserted into the ESC model, the stark differences in pricing remain.

- **Poor EA Labour Productivity** – EA's labour productivity for both repairs and replacements of all types of lights is starkly at odds with the benchmarks developed by the Victorian ESC. Most importantly, EA's assertion in its supplemental February 2005 submission to IPART that "ESC productivity assumptions are unrealistic" appears to be unsupported. The SLI Program notes in particular that the ESC and its consultant, KPMG, conducted a rigorous, fully public and iterative review of public lighting charges, which included performing detailed analyses and modelling of public lighting costs. This work covered five (5) Distribution Network Service Providers (DNSPs) and involved numerous open letters, a public issues paper, a draft determination and a final determination. Dozens of submissions were received at the various stages of this inquiry.
- **Inappropriate Asset Lives for Brackets** – As discussed in 4c below, EA's contention that bracket lives are 20 years appears at odds with the ESC determination and past EA practice.

<sup>1</sup> Supplemental EA submission to IPART, "EnergyAustralia Street Lighting", PB Associates, February 2005 – First presented to council representatives on 5 July 2005

A number of issues raised by EA's consultant in response to the February 2005 model submitted to IPART by the SLI Program appear irrelevant or incorrect. In particular:

- **Pre- 2001 Assets** - The SLI Program model specifically adjusts the ESC model to represent 100% of street lighting assets being funded by the DNSP. As such, the comments in the February 2005 supplemental submission to IPART regarding the ESC treatment of pre-2001 assets appear irrelevant. Any suggestion by EA's consultant that the ESC Vic's cost assessment in some way includes a 'cross-subsidy' from other distribution customers appears incorrect and furthermore overlooks the changes made to the model by the SLI Program to represent 100% funding of equipment by the DNSP.
- **Inappropriate Characterisation and Treatment of Bulk Lamp Replacement** – EA's supplemental submission to IPART appears to have mischaracterised the ESC's treatment of bulk lamp replacement. The actual bulk lamp replacement (BLR) cycles used in the ESC model are four years for residential roads and five years for main roads. As can be verified by leading lamp suppliers, years is a readily achievable BLR cycle for main road high pressure sodium lighting, provided that best practice is used in lamp selection (currently twin-arc HPS with inherent parallel redundancy). As such, the Victorian ESC model is consistent with the National Electricity Code in considering efficient operating and maintenance practices.

### **3) Inconsistent with analyses by EA's consultant**

In 2003 and 2004, EA engaged PBA to assess EA's cost to serve public lighting customers. In addition to examining EA's costs based on then-current practices, PBA also assessed the costs of an efficiently provided service (eg assuming that EA remedy certain specific obsolete practices and technologies that have long been recognised as such by the other electricity companies across Australia). PBA's cost to serve work indicated capital and operating costs that are lower than EA's pricing proposal by about \$5.5 million per year.<sup>2</sup>

Examples of EA's highly inefficient technology practices that were assessed by PBA include the following:

- a) use of halo-phosphor fluorescent lamps with short lives and high outage rates, rather than much longer lived and more reliable tri-phosphor lamps in all types of fluorescent fixtures;
- b) continued installation of 'tubular fluorescent twin 20 Watt' (TF2x20) luminaires despite their having become technically and commercially obsolete nearly 20 years ago. Notably, in addition to having high overall costs due to high outage rates, these devices provide virtually no compliance with Australian Standards for road lighting (with obvious public liability implications), and poor service levels due to their poor reliability. EA ceased installing new TF2x20 luminaires, only as of July 2004, after the repeated efforts by the SLI Program to inform EA as to the high cost and poor performance of these devices; and
- c) continued use of high wattage mercury vapour lighting on main roads (e.g., MBF 250W and MBF 400W) rather than higher efficiency high pressure sodium (HPS) lamps and, in the interim, HPS retrofit lamps. Again, we note that discontinuation of MBF lighting for most main road lighting tasks began some 15-20 years ago at other utilities. The failure to update practice is reflected in EnergyAustralia's main road lighting portfolio that still consists of some 65% MBF lighting.

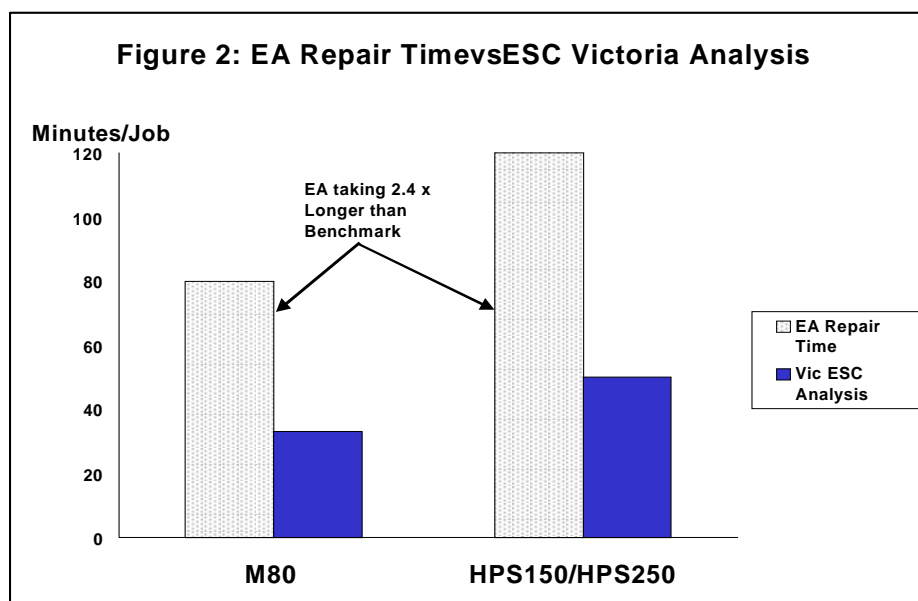
<sup>2</sup> Based on adjusting PBA's costs analyses for three years of CPI since the report data was gathered, and for a 7% WACC (rather than a 7.5% WACC), and for a building block rather than 'annuity' accounting approach. EA's poor technology practices assessed by PBA also result in excessive energy consumption, which burdens councils with excessive charges for retail energy and network use of about \$0.9million /year which is not included in the \$5.5 million figure, and produces excess greenhouse gas emissions of about 12,000 t CO<sub>2</sub> / yr,

A number of other highly inefficient practices were identified by the SLI Program but were not specifically assessed by PBA. These are discussed in the following section.

#### 4) *Inconsistent with other detailed analyses*

In addition to the issues specifically assessed by PBA as discussed above, a number of other highly inefficient practices and inappropriate costs have been identified for which adjustments need to be made in PBA's results and EA's proposed prices. These include the following:

- a) **Poor spot repair/replacement scheduling logistics.** Individual failures of luminaires require either repair for minor faults or replacement of the luminaire for more serious defects. As such, the attributed costs can show up as either operating costs (from minor faults) or capital expenditure (from replacements). EA has assumed very poor logistics and scheduling of both spot repairs and spot replacements, resulting in excessive estimates of travel times and labour costs. In particular, EA has assumed that travel times for spot fault repairs/replacements average 40 minutes. This suggests a mean distance between spot repairs/replacements of at least 20 km, which is grossly excessive, assuming reasonable logistics are applied to maintenance practices. Notably, the Victorian ESC's detailed cost analysis and modelling indicates that spot repair /replacement times at Victorian DNSPs – including those servicing areas with similar characteristics to EA - are considerably less than half of that assumed by EA (See Figure 2). *Assuming performance similar to that found in Victoria would reduce spot repair costs by more than \$1.2 m per annum, and reduce asset valuation by more than 10% (due to the high labour component in installed costs);*



- b) **Short bulk lamp replacement schedule.** EA has assumed a 30 month bulk lamp replacement schedule for all roads. This is inconsistent with the maintenance requirements in AS1158, lamp manufacturer's data, assumptions in the Victorian ESCs detailed cost analysis and current practice at Victorian utilities. Life and performance characteristics of key lamps suggest an appropriate bulk lamp replacement schedule is at least 36 months. *A 36 month schedule would have costs about \$0.9 million per annum lower than a 30 month schedule.*

- c) **Unduly short depreciation lives.** EA has adopted 20 years for depreciation of all public lighting assets, including brackets and connections.<sup>3</sup> However, while twenty years may be a reasonable assumption for the average life of luminaires, it is not appropriate for brackets and connections. Many brackets and connections still in use today were installed in the early 1960s, and EA's records do not indicate that there are more than a few bracket failures each year. Notably, the Victorian Essential Services Commission has adopted a 35 year average life for brackets in its analysis of public lighting charges.<sup>45</sup> This would appear more consistent with the average age of brackets on EA's system. EA has estimated the replacement cost of brackets and connections in the existing public lighting inventory at about \$65 million. *Basing the depreciation charge for these \$65 million of assets on an assumed 20 year life, as EA has done, overstates the actual 35 year depreciation charge by \$1.4 million/year.*

Adopting a highly inaccurate depreciation life assumption would be inconsistent with accounting standards and policy. Australian Accounting Standards (AAS4/AASB1021) and NSW Treasury policy (TPP 03-02 May 2003) support the use of more accurate average life estimates in assessing depreciation costs. These documents direct that assets be depreciated over their useful lives and that the depreciation rate be reviewed regularly. Adopting EA's assumed 20 year asset life would be inconsistent with both the AAS and the NSW Treasury policies.

- d) **Overstatement of number of lights.** EA's cost analyses appear to double-count the cost of shared lights at inter-council boundaries. This anomaly in EA's asset valuation was identified by PBA and the SLI Program, but PBA did not have the data needed to account for them at the time it performed its cost to serve analyses. *EA subsequently assessed that the double-counting of these shared lights represents some \$0.9 million/year<sup>6</sup> in capital and operating costs.*
- e) **Incorrect inclusion of council-contributed lights.** EA claims on page 10 of its submission that it "bears replacement responsibility" for \$39 million of contributed assets, and includes them in its capital expenditure forecast. This appears incorrect. Councils and other parties have contributed extensive lighting assets to EA, which are known as Rate 2 or Rate 3 assets. However, under the definitions of Rate 2 and Rate 3 provided to councils in pricing documentation, EA bears no responsibility, as repairs due to damage or replacements due to age are paid by customers. Accordingly, the \$39 million in customer-contributed assets, which represent nearly 20% of the total replacement of EA's street lighting assets, should not be included in EA's estimated costs nor should any capital expenditures derived from this number or these set of assets.
- f) **Internal inconsistencies in EA calculations.** Several of EA's calculations appear internally inconsistent, and in general, the information provided is inadequate to validate or explain the calculations. The SLI Program understands that EA's pricing proposal is intended to be based upon the cost to serve analysis performed by PBA in 2003. However, it should be noted that there are numerous areas in which the PBA report received by the SLI Program does not appear to reconcile with EA's pricing proposal, e.g., in asset valuation, operating costs, and capital related costs. Furthermore, EA has provided neither an explanation of deviations between its pricing proposal and the PBA report, nor a supporting cost analysis consistent with its pricing proposal. It should also

<sup>3</sup> It is, however, unclear how the claimed 20 year life relates to EA's proposed capital treatment in Section 2.2.4, p. 10 and the 'target revenue requirement' in Section 2.4, p 12, and EA's calculations may not be internally consistent.

<sup>4</sup> Essential Services Commission "Review of Public Lighting Excluded Service Charges – Draft Determination" April 2004, p. 48.

<sup>5</sup> PB Associates letter of 2 June 2005 posted on the IPART web site as a supporting document appears incorrect in stating that "...the range of asset lives for brackets and luminaires ranged from 20 year to 30 years" as is that statement in this letter that "...the effective useful life of the bracket is more commonly set at a similar age to the luminaires."

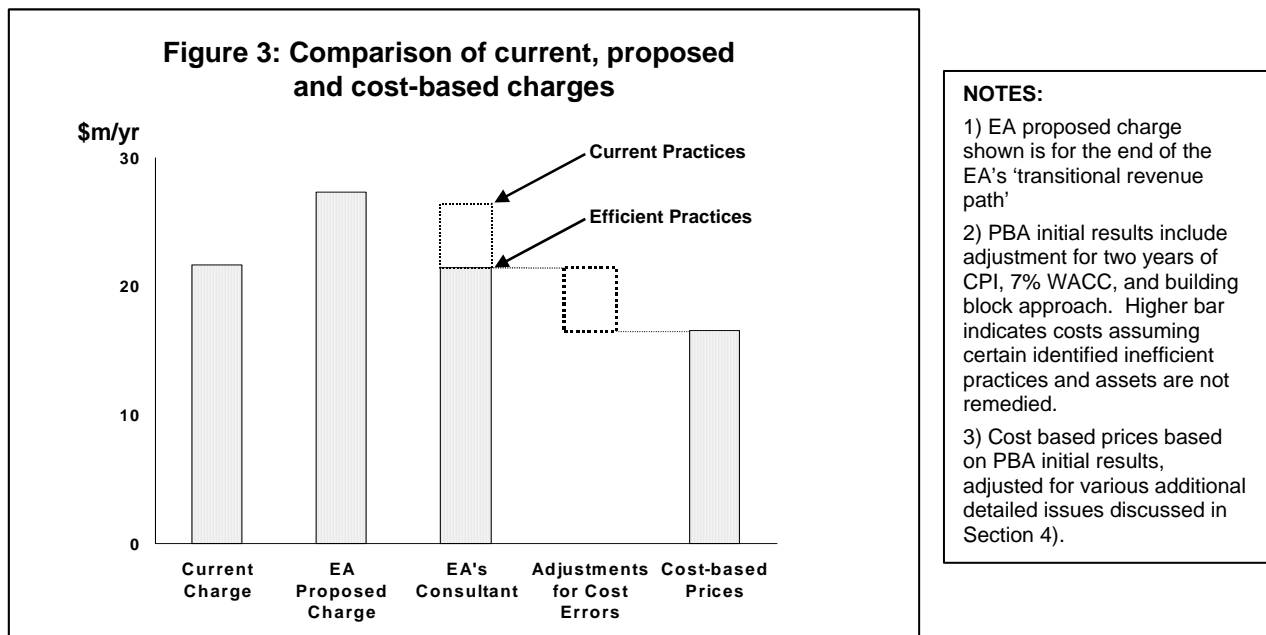
<sup>6</sup> As detailed in 28 April 2004 EnergyAustralia presentation material to councils

be noted that additional material provided by PBA, such as its letter to EA of 2 June 2005, similarly does not provide sufficient or consistent supporting information.

Illustrative examples include:

- EA's calculation of its "revenue requirement" shown on p. 5 appears internally consistent with the claimed asset value and operating costs. Even assuming those overstated cost components discussed above, the total revenue requirement would be \$0.8 million per year lower than EA's calculations.
- On page 10, EA claims that its street lighting assets have "an approximate replacement value of \$200M," including \$39 million of contributed assets. However, this claim does not reconcile with EA's statement on p. 8 that the opening asset base has a value of \$87 million based on assets being on average 10 years into a 20 year life. Rather, the opening asset base of EA funded assets would more appropriately be \$80.5 million, or 7.5% less.
- EA has provided inadequate information to either explain or validate the calculations in Section 2.4 that modify EA's proposed revenue requirement based on a different asset recovery approach.

Summarising cost inconsistencies identified in Sections 3 and 4 above, Figure 3, compares EA's proposed pricing with current prices, analysis by EA's consultant, and cost-based charges.



**5) Would overcharge by nearly \$80 million over coming decade**

Overall, EA's proposed pricing would overcharge councils by more than \$25 million during the four year pricing period. Assuming steady prices beyond the four year transitional revenue path, EA's proposed pricing would overcharge by \$80 million over the decade to 2004/05.

The SLI Program would be pleased to discuss any elements of the costing and provide additional detailed information to the Tribunal, if that would be of use.



## **6) *Would impede greenhouse and standards compliance investments***

There is no question that nearly half of the lighting assets currently in use are obsolete (with most having been obsolete even when installed). Councils recognise that replacing the obsolete assets will yield both greenhouse gas savings and improve compliance with Australian Standards for roadway lighting. They also recognise that considerable investment would be required.

However, endorsing an artificially high asset valuation would obstruct and delay the councils' ability to invest in modernisation.

As a key example, we note that EA has proposed to members of the SLI Program that councils be charged a flat \$150 capital recovery charge per luminaire in addition to labour charges for any removal of highly obsolete fluorescent lighting before it has reached 20 years of age. In short, to have EnergyAustralia remove assets it should not have installed in the first place, councils would have to pay the company at least \$15,000,000 of capital charges for 100,000 highly obsolete lights on EnergyAustralia's network, and pay a potentially comparable amount for labour costs associated with removal of these assets. This proposed charge would be reinforced and supported by an unduly high valuation placed on the existing assets.

## **7) *Would obstruct future council access to contestability***

Some councils may wish to access the contestable options for public lighting in the future, as this may prove to be an effective approach to modernisation of the obsolete network. However, as discussed above, establishing a high asset valuation for obsolete EA assets would support an undue capital recovery charge imposed by EA. This would obstruct councils' ability to use competitive service providers to replace obsolete assets, and effectively tie councils to EA.

## **8) *Would reward EA and further punish councils for poor EA practices.***

As detailed below, it would be inappropriate to charge councils for EA's longstanding highly inefficient practices, particularly as councils have had neither meaningful say nor recourse. The reasons include:

- **Charging for highly inefficient practices such as the continued use of obsolete technology would appear inconsistent with the National Electricity Code (NEC).** A key objective of distribution service pricing as specified in the NEC is to achieve a commercial revenue stream that includes a fair and reasonable rate of return to Distribution Network Owners *on efficient investment, given efficient operating and maintenance practices* of the Distribution Network Owners<sup>7</sup> (emphasis added). Similarly, pricing regulation is intended to "...seek the same outcomes as those achieved in competitive markets."<sup>8</sup> EA's longstanding obsolete practices are highly inefficient.
- **EA has had responsibility to ensure that the lighting technology practices in question were efficient and current – and failed in this responsibility.** Historically, councils have had little say on technology selection, and have been dependent on EnergyAustralia for performing public lighting services efficiently. Technical expertise and the vast bulk of technical lighting decisions have rested with EnergyAustralia and its predecessors for some ten decades. This is explicitly illustrated, for example, in agreements dating back decades

<sup>7</sup> National Electricity Code, Section 6.10.2 "Objectives of the distribution service pricing regulatory regime to be administered by the Jurisdictional Regulators"

<sup>8</sup> National Electricity Code, Section 6.1.1 "Summary of key principles and core objectives of network pricing"

which specified that EA would “keep the lamps and all appliances...efficient and reasonably in accordance with the latest improvements”<sup>9</sup> and statements that EA “has been exercising a close control over all aspects of costs with a view to minimising price increases.”<sup>10</sup> Councils have had every reason to expect that EA makes appropriate technology choices.

- **EA technology practices fell far below industry norms** – For some decades, there has been long-standing acceptance and use of superior alternative approaches by other utilities, including those in NSW. The proposed alternative approaches are commercially available and well demonstrated. It is particularly notable that the TF2x20W and TF1x40W fixtures have long been recognised as obsolete by virtually all other utilities in Australia. In contrast with EA, which has continued to install these obsolete fixtures right up until 2004, other utilities generally ceased installing them in the 1980s, with some even undertaking active campaigns to accelerate their replacement. Similarly, with respect to main roads, most utilities in Australia and in other parts of the developed world began phasing out mercury vapour lighting up to 20 years ago, generally replacing it with high pressure sodium lighting.
- **Councils have had no input on lighting technology in use across the large majority of existing lighting assets and practices.** With respect to luminaires, the large majority of existing assets in EA's territory involve replacement of failed units. In the case of luminaire replacements, the technology choice has typically been made unilaterally by EA without any council consultation. With respect to lamp selection (e.g., use of short life halophosphor lamps), again, the choice has been made unilaterally by EA without reference to council, as one element of its maintenance activity.
- **On those occasions in which some council input was involved, councils generally requested and relied on EA advice – and we now know that advice was typically incorrect and incomplete.** For example, councils have regularly received requests from the public for additional lighting to be installed. In those cases, the normal practice was for the council to refer the request to EA, seeking advice as to whether and what type of new luminaire would be appropriate. EA regularly recommended use of additional TF2x20s.<sup>11</sup> Furthermore, it should be noted that EA also continued to encourage the use of TF2x20s through prices which were lower than those for the better performing mercury luminaires widely used by other utilities, and indicating that such cost differences were cost-reflective.<sup>12</sup> The pricing, based on poor cost analyses, continually and inappropriately encouraged councils to accept TF2x20s.

Thank you again for the opportunity to make this submission. The SLI Program would be pleased to answer any questions you have related to the matters raised.

Yours sincerely

Graham Mawer  
Program Manager

<sup>9</sup> PBA “Streetlighting Cost to Serve” 16 October 2003, which cites that council contracts from the 1970s specified that EA shall “keep the lamps and appliances...efficient and reasonably in accordance with the latest improvements.” p. 28.

<sup>10</sup> Sydney Electricity letter to councils, 27 June 1991.

<sup>11</sup> See, e.g., a general design guidance provided in a letter from EnergyAustralia to Sutherland Shire Council, 16 April 1997; and numerous specific examples, e.g., EnergyAustralia, letter to Burwood Council, 8 September 2003.

<sup>12</sup> See, e.g., Sydney Electricity, letter to Marrickville Council, 12 May 1995 in response to a query regarding the most cost efficient and lowest cost lighting solution for residential streets.

## Introduction to Draft Decision Cost Build-up Model

September 2003. The charges established within the model were used to undertake the analysis of the three most common (Mercury Vapour 80 watt, Sodium High Pressure 150 and 250 watt lights). The charges established within the model are the result of the use of the model and a assumptions analysis. Following the review of the Commission's Draft Decision Paper as published and available on the Commission's web site ([www.esc.vic.gov.au](http://www.esc.vic.gov.au)).

## Input parameters

### Inputs - all lamps

|  |        |  |
|--|--------|--|
| Material premium for rural areas             | 5%     |  |
| Labour rate (per hour)                       | \$60   |  |
| Labour rate (per hour) for night patrol      | \$69   | changed in final determination from \$60 |
| Elevated platform vehicle for m80 (per hour) | \$35   |  |
| elevated platform vehicle per hour for hps   | \$45   | changed in final determination from \$35 |
| Patrol vehicle (per hour)                    | \$10   |  |
| Number of hours in a day                     | 8.33   |  |
| Rate of return (per annum)                   | 9.50%  |  |
| Indirect overheads (exc CitiPower)           | 25.00% |  |
| Indirect overheads - CitiPower               | 33.00% |  |
| Number of years from 1 January 2001          | 4.00   |  |

### Inputs - MV80

|   |          |                                     |
|---|----------|-------------------------------------|
| Depreciation period                                   | 20 years |                                     |
| Lamps - bulk change                                   | 4 years  |                                     |
| PE cells - bulk change                                | 8 years  |                                     |
| Proportion of lamps that fail between bulk change     | 15%      |                                     |
| Unit cost - lamp                                      | \$4.57   |                                     |
| Unit cost - PE cell                                   | \$18.45  |                                     |
| Unit cost - luminaire                                 | \$158.55 | changed in final detn from \$168.19 |
| Unit cost - miscellaneous materials in fault repairs  | \$10.00  | changed in final detn from \$2      |
| Unit cost - misc materials for bulk replacement       | \$1.00   | changed in final detn from \$2      |
| Number of men in crew                                 | 2        |                                     |
| Number of bulk lamp changes in 8 1/3 hour day - urban | 90       | changed in final detn from 100      |
| Number of bulk lamp changes in 8 1/3 hour day - rural | 75       | changed in final detn from 80       |
| Number of repairs in 8 1/3 hour day - urban           | 30       |                                     |
| Number of repairs in 8 1/3 hour day - rural           | 25       |                                     |
| Number of luminaires replaced per day - urban         | 16       | changed in final detn from 20       |
| Number of luminaires replaced per day - rural         | 13       | changed in final detn from 16       |

### Inputs - S-HP150

|                                     |          |                                    |
|-------------------------------------|----------|------------------------------------|
| Depreciation period                 | 20 years |                                    |
| Number of patrols per year          | 3        |                                    |
| Lamps - frequency of replacement    | 5 years  |                                    |
| PE cells - frequency of replacement | 10 years |                                    |
| Unit cost - lamp                    | \$33.05  | changed in final detn from \$38.79 |
| Unit cost - PE cell                 | \$17.95  |                                    |
| Unit cost - luminaire               | \$187.64 |                                    |

|   |        |                               |
|---|--------|-------------------------------|
| Unit cost - miscellaneous materials             | \$2.00 |                               |
| Number of men in crew - road patrols            | 2      |                               |
| Number of men in crew - repairs (exc CitiPower) | 2      |                               |
| Number of men in crew - repairs (CitiPower)     | 2.5    |                               |
| Number of lamps patrolled in 1 day - urban      | 3,000  |                               |
| Number of lamps patrolled in 1 day - rural      | 2,000  |                               |
| Number of repairs in 8 1/3 hour day - urban     | 20     |                               |
| Number of repairs in 8 1/3 hour day - rural     | 16     |                               |
| Number of luminaires replaced per day - urban   | 16     | changed in final detn from 20 |
| Number of luminaires replaced per day - rural   | 13     | changed in final detn from 16 |

### Inputs - S-HP250

|   |          |                                    |
|---|----------|------------------------------------|
| Depreciation period                             | 20years  |                                    |
| Number of patrols per year                      | 3        |                                    |
| Lamps - frequency of replacement                | 5years   |                                    |
| PE cells - frequency of replacement             | 10years  |                                    |
| Unit cost - lamp                                | \$33.21  | changed in final detn from \$44.31 |
| Unit cost - PE cell                             | \$17.95  |                                    |
| Unit cost - luminaire                           | \$190.44 |                                    |
| Unit cost - miscellaneous materials             | \$2.00   |                                    |
| Number of men in crew - road patrols            | 2        |                                    |
| Number of men in crew - repairs (exc CitiPower) | 2        |                                    |
| Number of men in crew - repairs (CitiPower)     | 2.5      |                                    |
| Number of lamps patrolled in 1 day - urban      | 3,000    |                                    |
| Number of lamps patrolled in 1 day - rural      | 2,000    |                                    |
| Number of repairs in 8 1/3 hour day - urban     | 20       |                                    |
| Number of repairs in 8 1/3 hour day - rural     | 16       |                                    |
| Number of luminaires replaced per day - urban   | 16       | changed in final detn from 20      |
| Number of luminaires replaced per day - rural   | 13       | changed in final detn from 16      |

### Dedicated street lighting poles

|  |           |                               |
|--|-----------|-------------------------------|
| Period of inspection                                     | 5years    |                               |
| Pole inspection and repair rate                          | 75per day | changed in final detn from 24 |
| Depreciation of dedicated street lighting pole & bracket | 35years   |                               |
| Cost of pole & bracket                                   | \$500     |                               |
| Number of poles & brackets replaced per day              | 4         |                               |
| Cost of bracket  | \$40      |                               |
| Number of brackets replaced per day                      | 20        | changed in final detn from 30 |

### Other direct costs

|                        |        |                              |
|------------------------|--------|------------------------------|
| Call centre            |        |                              |
| AGL                    | 60000  | 6,000 calls @ \$10 per call  |
| CitiPower              | 60000  | 6,000 calls @ \$10 per call  |
| Powercor               | 10000  | 10,000 calls @ \$10 per call |
| TXU                    | 10000  | 10,000 calls @ \$10 per call |
| United Energy          | 10000  | 10,000 calls @ \$10 per call |
| GIS and other          | 100000 |                              |
| Complaints handling    | 30000  |                              |
| Total number of lights |        |                              |
| AGL                    | 62944  |                              |
| CitiPower              | 50934  |                              |

Powercor  
TXU  
United Energy

120319  
102409  
116960



analysis of the three most common standard light types  
established with the preliminary model were based on  
as Draft Decision Paper published on 28 April 2003

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### **SLI Program Notes:**

#### **1) Source of Victoria Draft Decision Cost Build-Up Model:**

<http://www.esc.vic.gov.au/apps/>

**2) The SLI Program updated the  
Victoria Draft Decision Cost Build  
Model to incorporate changes in  
ESC Final Determination model,  
shown in blue.**

**3) The SLI Program made  
modifications to the model for  
consistency with NSW regulator  
issues, as shown in green.**

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call costs changed in final detn from \$12 to \$10







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**Mercury Vapour 80 Watt Standard Light Type -  
Cost build-up**

Additional assumptions

Proportion of lights that will fail before bulk change 15%  
 Proportion of lights that will fail before bulk change (per year) 3.8%  
 Overheads are applied to material and labour components  
 All costs and charges are exclusive of GST

|                                 | Unit rate | Number | Hours |
|---------------------------------|-----------|--------|-------|
| <b>MV80 - Urban</b>             |           |        |       |
| Materials - bulk lamp change    |           |        |       |
| Lamp                            | \$4.57    | 90     |       |
| PE cell                         | \$18.45   | 45     |       |
| Miscellaneous                   | \$1.00    | 90     |       |
| Materials - repair of faults    |           |        |       |
| Lamp                            | \$4.57    | 60%    |       |
| PE cell                         | \$18.45   | 50%    |       |
| Miscellaneous                   | \$10.00   | 10%    |       |
| Labour - bulk lamp change       |           |        |       |
| Crew costs                      | \$60      | 2      | 8.33  |
| Elevated platform vehicle costs | \$35      | 1      | 8.33  |
| Labour - repair of faults       |           |        |       |
| Crew costs                      | \$60      | 2      | 8.33  |
| Elevated platform vehicle costs | \$35      | 1      | 8.33  |
| Overheads                       | 25.00%    |        |       |
| Luminaires                      |           |        |       |
| Material & misc                 | \$168.55  | 16     |       |
| Crew costs                      | \$60      | 2      | 8.33  |
| Elevated platform vehicle costs | \$35      | 1      | 8.33  |
| Luminaire - depreciation        |           |        |       |
| Luminaire - return on           |           |        |       |
| Dedicated poles - inspection    |           |        |       |
| Dedicated poles & bracket       |           |        |       |
| Brackets                        |           |        |       |
| Material                        | \$40      | 20     |       |
| Crew costs                      | \$60      | 2      | 8.33  |
| Elevated platform vehicle costs | \$35      | 1      | 8.33  |
| Brackets - depreciation         |           |        |       |
| Brackets - return on            |           |        |       |

**NOTE: EA proposed pricing for M80, including luminaire, lamp, & bracket based on 27.34% real increase on current pricing, is:**

**\$63.43**

**Percent by which EA's proposed pricing exceeds costs based on ESC's analysis:**

**44%**







| Cost         | Annualised cost | Annualised unit cost |
|--------------|-----------------|----------------------|
| \$ 411.30    | \$ 82.26        | \$ 2.96              |
| \$ 830.25    | \$ 166.05       |                      |
| \$ 90.00     | \$ 18.00        |                      |
| \$ 2.74      | \$ 12.97        | \$ 0.49              |
| \$ 9.23      |                 |                      |
| \$ 1.00      |                 |                      |
| \$ 999.60    | \$ 299.88       | \$ 4.30              |
| \$ 291.55    | \$ 87.47        |                      |
| \$ 999.60    | \$ 43.04        | \$ 1.61              |
| \$ 291.55    |                 | \$ 2.34              |
| \$ 2,696.80  | \$ 249.25       |                      |
| \$ 999.60    |                 | \$ 12.46             |
| \$ 291.55    |                 | \$ 11.84             |
| \$ 800.00    | \$ 104.56       |                      |
| \$ 999.60    |                 | \$ 2.99              |
| \$ 291.55    |                 | \$ 4.97              |
| <b>TOTAL</b> |                 | <b>\$ 43.96</b>      |

Final det'n revised to not include BLR in year 20

Final det'n revised the frequency of repairs as follows: 60% need new lamp

Final det'n revised the frequency of repairs as follows: 60% need new lamp

Final det'n revised to not include BLR in year 20

Revised cell G31 and G32 consistent with 100% of luminaires being funded

Dedicated pole costs omitted, to allow like-for-like comparison of lamp+lum

Revised cell G39 and G40 consistent with 100% of luminaires being funded





## Sodium High Pressure 150 Watt Standard Light Type - Cost build-up

### Additional assumptions

Overheads are applied to material and labour components

All costs and charges are exclusive of GST

|                                     | Unit rate | Number | Hours | Cost       |
|-------------------------------------|-----------|--------|-------|------------|
| <b>S-HP 150 - urban</b>             |           |        |       |            |
| <b>Materials</b>                    |           |        |       |            |
| Lamp                                | \$33.05   | 60%    |       | \$ 19.83   |
| PE cell                             | \$17.95   | 50%    |       | \$ 8.98    |
| Miscellaneous                       | \$2.00    | 10%    |       | \$ 0.20    |
| <b>Labour - Patrol</b>              |           |        |       |            |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Vehicle costs                       | \$10      | 1      | 8.33  | \$ 83.30   |
| <b>Labour - Repair of faults</b>    |           |        |       |            |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Elevated platform vehicle costs     | \$45      | 1      | 8.33  | \$ 374.85  |
| Overheads                           | 25%       |        |       |            |
| <b>Luminaires</b>                   |           |        |       |            |
| Material & misc                     | \$189.64  | 16     |       | \$3,034.24 |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Elevated platform vehicle costs     | \$45      | 1      | 8.33  | \$ 374.85  |
| Luminaire - depreciation            |           |        |       |            |
| Luminaire - return on               |           |        |       |            |
| <b>Dedicated poles - inspection</b> |           |        |       |            |
| <b>Dedicated poles</b>              |           |        |       |            |
| <b>Brackets</b>                     |           |        |       |            |
| Material                            | \$40      | 20     |       | \$ 800.00  |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Elevated platform vehicle costs     | \$45      | 1      | 8.33  | \$ 374.85  |
| Brackets - depreciation             |           |        |       |            |
| Brackets - return on                |           |        |       |            |

**NOTE: EA proposed pricing for HPS150, including luminaire, lamp, & bracket based on 27.34% real increase on current pricing, is:**

**\$154.80**

**Percent by which EA's  
proposed pricing exceeds  
costs based on ESC's  
analysis:**

**147%**

| Annualised cost | Annualised unit cost |
|-----------------|----------------------|
| \$ 29.01        | \$ 5.80              |
| \$ 0.36         | \$ 1.08              |
| \$ 75.59        | \$ 15.12             |
|                 | \$ 5.50              |
| \$ 275.54       |                      |
|                 | \$ 13.78             |
|                 | \$ 13.09             |
| \$ 108.72       |                      |
|                 | \$ 3.11              |
|                 | \$ 5.16              |
| <b>TOTAL</b>    | <b>\$ 62.64</b>      |

Final det'n revised the frequency of repairs as follows: 60% need new lamps; 50% F

Revised cell G26 and G27 consistent with 100% of luminaires being funded by EA,  
Dedicated pole costs omitted, to allow like-for-like comparison of lamp+luminaire+b

Revised cell G34 and G35 consistent with 100% of luminaires being funded by EA,





## Sodium High Pressure 250 Watt Standard Light Type - Cost build-up

### Additional assumptions

Overheads are applied to material and labour components

All costs and charges are exclusive of GST

|                                     | Unit rate | Number | Hours | Cost       |
|-------------------------------------|-----------|--------|-------|------------|
| <b>S-HP 250 - urban</b>             |           |        |       |            |
| <b>Materials</b>                    |           |        |       |            |
| Lamp                                | \$33.21   | 60%    |       | \$ 19.93   |
| PE cell                             | \$17.95   | 50%    |       | \$ 8.98    |
| Miscellaneous                       | \$2.00    | 10%    |       | \$ 0.20    |
| <b>Labour - Patrol</b>              |           |        |       |            |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Vehicle costs                       | \$10      | 1      | 8.33  | \$ 83.30   |
| <b>Labour - Repair of faults</b>    |           |        |       |            |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Elevated platform vehicle costs     | \$45      | 1      | 8.33  | \$ 374.85  |
| Overheads                           | 25.00%    |        |       |            |
| <b>Luminaires</b>                   |           |        |       |            |
| Material & misc                     | \$192.44  | 16     |       | \$3,079.04 |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Elevated platform vehicle costs     | \$45      | 1      | 8.33  | \$ 374.85  |
| Luminaire - depreciation            |           |        |       |            |
| Luminaire - return on               |           |        |       |            |
| <b>Dedicated poles - inspection</b> |           |        |       |            |
| <b>Dedicated poles</b>              |           |        |       |            |
| <b>Brackets</b>                     |           |        |       |            |
| Material                            | \$40      | 20     |       | \$ 800.00  |
| Crew costs                          | \$60      | 2      | 8.33  | \$ 999.60  |
| Elevated platform vehicle costs     | \$45      | 1      | 8.33  | \$ 374.85  |
| Brackets - depreciation             |           |        |       |            |
| Brackets - return on                |           |        |       |            |

**NOTE: EA proposed pricing for HPS250, including luminaire, lamp, & bracket based on 27.34% real increase on current pricing, is:**

**\$155.48**

**Percent by which EA's proposed pricing exceeds costs based on ESC's analysis:**

**140%**

| Annualised cost | Annualised unit cost |
|-----------------|----------------------|
| \$ 29.10        | \$ 5.82              |
| \$ 0.36         | \$ 1.08              |
| \$ 82.47        | \$ 16.49             |
|                 | \$ 5.85              |
| \$ 278.34       |                      |
|                 | \$ 13.92             |
|                 | \$ 13.22             |
| \$ 108.72       |                      |
|                 | \$ 3.11              |
|                 | \$ 5.16              |
| <b>TOTAL</b>    | <b>\$ 64.65</b>      |

Final det'n revised the frequency of repairs as follows: 60% need new lamps; 50%

Revised cell G26 and G27 consistent with 100% of luminaires being funded by E

Dedicated pole costs omitted, to allow like-for-like comparison of lamp+luminaire

Revised cell G34 and G35 consistent with 100% of luminaires being funded by E