Energy Efficient Street lighting

Discussion Paper

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Contents

1. Purpose

The purpose of this discussion paper is to:

- Outline and assess the barriers and opportunities for energy efficient street lighting projects for the Western Australian (WA) Local Government sector.
- Propose main aims for the Association's advocacy in an attempt to remove barriers and promote and create opportunities.
- Collect comments and feedback from the sector about their issues, expectations and recommendations for the Association's next steps.

2. Scope

This discussion paper will investigate the current situation for accessing and retrofitting energy efficient street lighting across all WA Local Governments, including both metropolitan and regional Local Governments. It will investigate the arguments for more competition in the street lighting sector and greater transparency for street lighting tariffs. Additionally, this paper will investigate Local Governments access to Light Emitting Diode (LED) energy efficient street lighting technology specifically.

3. Next Steps

After the release of this discussion paper, these are the proposed next steps and the expected completion dates.

Actions	Expected completion date
Release External Discussion Paper to the Local Government sector.	Friday 7 November 2014
Submission due back from the Local Government sector to the Association.	Monday 12 January 2014
Collate responses and feedback from the sector into a final action plan.	Friday 30 January 2015
Develop a State Council Item for Decision outlining the proposed advocacy strategy main aims. Seek endorsement from State Council.	April 2015
Implement approved advocacy action plan.	Ongoing from April 2015

4. Have your say

To assist the Association's research on the topic of energy efficient street lighting, the following discussion paper has been released for sector consultation. The feedback received will be used to develop advocacy actions for the Association to support the sector's access to energy efficient street lighting options.

Please use the detached template provided on WALGA's Climate Change Management Toolkit to submit your comments to the Association. Editable electronic submissions are preferred (i.e. MS Word and not PDF), where possible.

Options to submit your feedback are:

- Email: cperks@walga.asn.au
- Post: Attention Climate Change Coordinator, Western Australian Local Government Association, 170 Railway Parade, West Leederville WA 6007
- Fax: (08) 9213 2077

5. Introduction

Street lighting is a key consideration for the Western Australian Local Government sector from several perspectives; including environmental, economic and community safety. It can easily be argued that local street lighting is core business for Local Governments.

Local Governments around Australia understand that there are massive energy, cost, and greenhouse savings to be made from changing over street lighting to more energy efficient alternatives[1]. Improving the energy efficiency of street lighting can reduce costs and free up resources for other pressing community needs.

5.1 Increased Costs

According to the Association's conservative estimates, approximately one third of Local Government energy expenditure, estimated at $40 million per annum in Western Australia, goes toward street lighting tariffs.

Street lighting tariffs in Western Australia have increased by over 100 per cent since 2007/08. Additionally, Local Governments are alarmed by the 2014/15 State budget's forecast that street lighting tariffs will increase by 37 per cent in 2015/16 and 8 per cent in 2016/17. The Association estimates that the proposed 2015/16 tariff increase alone will represent an additional cost of $15 million per annum to the Local Government sector.

5.2 Greenhouse Emissions

For most Local Governments, street lighting is the largest source of greenhouse gas emissions. The Association is aware of one particular instance, where street lighting accounted for approximately 44 per cent of a Local Government's total greenhouse emissions. The Shire of Capel calculated that their street lighting emissions were almost as great as the emissions from electricity use at the Shire's facilities, and all emissions from fuel use in Shire's fleet combined[2]. This is a substantial amount of emissions for individual Local Governments.

[1] Ironbark Sustainability. 2012. *LED Street Lights: Separating Myths from Fact.* Last Accessed 19 August 2014 from http://www.ironbarksustainability.com.au/newsletter-articles/led-street-lights-separating-myths-from-facts/.
[2] South West Country Zone. 2014. *Agenda- June 2014.*

For these important reasons, the Association is developing an advocacy strategy and an action plan to support and work towards availability of energy efficient street lighting for the Local Government sector.

Discussion Questions

1. What is the annual cost of street lighting energy use for your Local Government?
2. If your Local Government measures its annual greenhouse gas emissions, can you determine the amount that relates to street lighting? If so, what is it?
3. Does your Local Government support the Association developing an advocacy strategy and action plan to support availability of energy efficient street lighting for the Local Government sector?

6. Background

Local Governments are legally responsible for providing street lighting in Western Australia and paying for the energy use and maintenance of minor road and residential street lighting. Of these street lights, the majority are owned and maintained by the electricity distribution utilities[3]. Main Roads WA pays 50 per cent of the street lighting costs on highways and other state roads and for all lighting on controlled access highways and freeways.

In WA, the relevant utilities are Western Power and Horizon Power (see Appendix 4). According to Ironbark Sustainability's recent calculations, there are 221,495 street lights in WA. There are 16,338 street lights in the Horizon Power area and the remainder, 205,157 lights, in Western Power's area[4].

The current arrangement between Local Governments and WA utilities in regards to street lighting has continued to provide barriers to energy efficient street lighting (see Appendix 4). Due to this, there has been a range of work undertaken by the Association to support the sector's concerns. This is demonstrated clearly within Appendix 2, with the Association's earliest policy position of street lighting endorsed in 2003.

6.1 Western Power

Western Power operates in the South West Interconnected System (SWIS) areas of Western Australia and they control 90 per cent of public lighting in Western Australia[5].

In 2011, Western Power, after significant advocacy from the Association and the Local Government sector, introduced a 42W Compact Fluorescent Lamps (CFL), a more sustainable alternative, into its lighting options. This allowed Local Governments access to 42W CFL technology. The capital cost burden of the infrastructure upgrade (luminaire) to accommodate the new lamps was to be borne by Local Government except where the existing luminaire is no longer serviceable or new lights were being installed as part of the State Underground Power Program.

There has been no substantial take up of CFL technology by Local Governments to date. It could be argued that there were two main reasons for this:

- that the CFL tariff was not cost comparative with existing technologies; and

[3] ACELG. 2014. *LED Street Lights save money, Carbon Emissions and Lives.* Last Accessed 1 September 2014 from http://www.acelg.org.au/news/led-street-lights-save-money-carbon-emissions-and-lives
[4] Ironbark Sustainability. 2013. *Energy Efficient Street Lighting Opportunity, a National Perspective*.
[5] WALGA. 2011. *A Sustainable Street Lighting Project Proposal for Western Australia.* Last Accessed 17 September 2014 from http://www.walgaclimatechange.com.au/announcements/sustainable-street-lighting-project-for-western-australia

- the capital cost of the infrastructure upgrade (luminaire) to accommodate the new lamps was to be borne entirely by the Local Government.

For these reasons, retrofitting CFLs did not provide a reasonable pay-back period, which limited the uptake of CFL technology by Local Government.

This highlights why it is important for the Association to take action to support a transition to energy efficient street lighting, in particular, to support transparent and competitive tariffs and investigate and promote funding opportunities for bulk scale replacement. If the Association is successful in achieving the outlined main aims within this paper, then the barriers for Local Government to transition to sustainable and cost effective street lighting should be lessened.

6.2 SWIS bulk replacement project

In early 2012, the Association developed a Sustainable Local Government Street Lighting Feasibility Study and Business Case. This project aimed to facilitate a bulk replacement of street lights in the SWIS with CFL technology.

This project sought funding from the Federal Community Energy Efficiency Program (CEEP) and the WA State Government. Unfortunately, the Association was not successful in receiving funding for the SWIS Sustainable Street lighting Bulk Replacement Project[6].

Regardless, Western Power has been replacing street lights with CFL technology as part of the rolling State Underground Power Project. By the end of 2013, around 40,000 42W CFLs had been installed to replace the existing 80W Mercury Vapour (MV) lighting. It is expected that Western Power will continue this replacement program at a rate of around 10,000-15,000 luminaries each year. The State Undergrounding Project is currently funded until July 2018[7]. To underground the remaining electricity distribution network in the Perth metropolitan area will take around 40 years at the current rate of investment.

Case study 1: Warrnambool City Council

Warrnambool City Council is Australia's first to use highly efficient LED technology for a bulk changeover of residential street lighting. The council of the Victorian coastal city is set to replace around 2,000 Mercury Vapour (MV) street lamps with LEDs, following the approval of the technology by local network provider Powercor – a move that will slash its street lighting costs by almost 70 per cent. The Clean Energy Financing Corporation, which provided approximately $600,000 towards the project, has backed street lighting upgrades for several other councils, and says that in Victoria alone, the street lighting upgrade opportunities represent an investment of more than $100 million.[1]

6.3 Horizon Power

Horizon Power services communities in the Pilbara, Kimberley, Gascoyne, Mid-West and southern Goldfields (Esperance) regions, dispersed across an area of approximately 2.3 million square kilometres.

Horizon Power has included LED technology in their preferred lighting options, due to its robust nature in remote locations. The cost of maintaining these is lower than other light types and the great distances involved mean this is very cost effective.

[6] WALGA. 2012. *Sustainable Street Lighting Project for Western Australia.* Last Accessed on 1 September 2014 from http://www.walgaclimatechange.com.au/announcements/sustainable-street-lighting-project-for-western-australia
[7] WALGA. 2012. *Streetlighting Bulk Replacement Program, Business Case*. Last Accessed 1 September 2014 from http://www.walgaclimatechange.com.au/announcements/sustainable-street-lighting-project-for-western-australia

6.4 Pilbara Street lighting Retrofit Project

Horizon Power has also partnered with the Association on a project to retrofit LEDs into four towns in the Pilbara. This project, funded through the CEEP, aims to; reduce energy costs, reduce maintenance costs, cut emissions for the four relevant towns and complements Horizon Power's Pilbara Undergrounding Power Project (PUPP).

This project can now be utilised as a WA case study for similar bulk replacement projects. It replaced a range of technologies including High Pressure Sodium (HPS) and MV with LED technology across three Local Governments.

Case study 2: City of Sydney

The City of Sydney is in the process of replacing 6,500 conventional lights with LEDs in central Sydney, Glebe, Darlinghurst, Zetland, Pyrmont, Kings Cross, Newtown and Redfern. More than 2600 street and park LED lights have already been installed.

The City announced in August 2013 that it had saved almost $300,000 and reduced energy use by more than 25 per cent since March 2012. Public lighting accounts for one-third of the City's annual electricity bill and a large part of its greenhouse gas emissions.
Importantly, more than 90 per cent of people surveyed by the City said they found the new lights appealing and three-quarters said the LEDs' white light (cool colour temperature) improved visibility.
The NSW Government is following the City's lead by encouraging 41 councils across Sydney, the Central Coast and the Hunter regions to work with Ausgrid to implement similar LED lighting projects.[8]

[8] Sustainability Matters. 2014. *LEDs set to improve sustainability of Australia's street lighting*. Last Accessed 31 July 2014 from http://www.sustainabilitymatters.net.au/articles/67522-LEDs-set-to-improve-sustainability-of-Australia-39-s-street-lighting

7. Street lighting Advocacy – The Association's Role

As an industry association, advocacy is a key part of the relationship that the Association has with its membership, the Local Government sector. As outlined in the Association's strategic plan, the Association exists to provide representation and services that deliver value to member Local Governments.

The Association will deliver these benefits by:

- Providing strong representation for Local Government;
- Providing effective leadership for Local Government;
- Building a positive profile for Local Government; and
- Enhancing the capacity of Local Government to deliver services[9].

Street lighting has been an ongoing issue for the WA Local Government Association and has been the focus of a number of projects undertaken and motions passed by the Association (see Appendix 2).

This street lighting discussion paper has a broader focus than previous work and proposes four main aims for the Association. This discussion paper also investigates specific actions for the Association and the sector to undertake, to advocate and support Local Governments' access and transition to energy efficient street lighting.

Case study 3: City of Los Angeles

In one of the largest solid-state lighting retrofit installations in the world to date, the Los Angeles LED Conversion Program replaced over 141,000 street light fixtures with LED units over a four-year period.

The expected savings of the new lights has exceeded the initial program goals. Energy use has been reduced by 63 per cent and carbon emissions by 47,583 metric tonnes a year. This proposal has generated savings in energy and maintenance costs that will pay for the estimated loan amount in seven years.
Ed Ebrahimian, Director of the Bureau of Street Lighting at the City of Los Angeles, recently commented: "The importance of the LED Conversion Program cannot be overstated. It is a shining example of how green technology can be both environmentally responsible and cost effective. With the LED program, we have transformed the night landscape of the City of Los Angeles, made our city safer and pedestrian friendly."

[9] WALGA. 2010. *Association's Strategic Plan 2010- 2015.* Last Accessed 17 September 2014 from http://www.walga.asn.au/AboutWALGA/WALGADetailsContacts/StrategicPlan20102015.aspx

8. Main aims

The proposed main aims for the Association to achieve are:

8.1 Transparent and competitive street lighting tariffs (existing and proposed) including:

- Greater clarity and reasoning on proposed tariff increases;
- Transparent information concerning the components of the tariff for each type of street light provided to Local Government within power utility invoices;
- Benchmarking street lighting tariffs nationally across power utilities; and
- Strengthening the role of the Economic Regulation Authority (ERA) in setting tariffs for monopoly suppliers.

8.2 Greater competition in the street lighting sector:

- Access for other energy providers, infrastructure providers and maintenance providers to the street lighting market;
- Provide feedback to the Public Utilities Offices (PUO) Electricity Market Review within the public consultation;
- Promote the Association's relevant preferred supplier panel to Local Governments as an effective procurement medium; and
- Explore potential business development opportunities for the Association in the development of integrated supply solutions and alternative supply structures for public lighting and related services.

8.3 Network operators to offer energy efficient street lighting options, including LED technology:

- Encourage the release of Western Power's business case for energy efficient street lighting; and
- Improve Local Government access to energy efficient street light technology.

8.4 Large scale bulk replacement of energy efficient street lighting in Western Australia:

- Seek and highlight State and Federal Government funding for large scale bulk replacement project funding opportunities;
- Explore other methods of financing bulk replacement projects, including loans from the WA Treasury Corporation;
- Reduce the barriers to energy efficient street lighting so that Local Governments can access funding when it becomes available;
- Develop a business case to provide the sound basis for investment by Local Government and electricity distributors; and
- Measure and articulate the value of the environmental, sustainable and social benefits achieved through a bulk replacement program.

Discussion Questions

4. Do you think the listed aims sufficiently cover the main issues in relation to energy efficient street lighting? If not, what are the gaps?
5. Are there any additional aims that you would like the Association to include within an advocacy strategy? If so, please provide details?

9. Key Barriers to Action

There are a number of key barriers to achieving the four key aims outlined in the above section. It is important that the Association considers these key barriers.

9.1 Regulatory environment

Currently Western Power owns, operates and maintains approximately 90 per cent of Western Australia's public lighting infrastructure[10]. Local Government pays the provider and operator of public lighting infrastructure for the maintenance and energy consumption of this infrastructure.

Given this situation, there are limited alternatives for Local Government in Western Australia's SWIS to address their energy and emissions issues other than to work with Western Power in pursuing energy, environmental and financial efficiencies in street lighting.

Horizon Power's arrangement with regional Local Governments is similar to Western Powers. Horizon Power owns, operates and maintains street lighting infrastructure, and Local Governments pay for the maintenance and energy consumption.

Horizon Power's regulatory environment is different from Western Power's, in that they already included LED technology to their street light range and on the 1 September 2013 they gazetted three LED street light types to the ERA. Horizon Power's 56W and 112W LED technology is currently being installed within the aforementioned Pilbara Street lighting Retrofit Project.

9.1.1 Non-contestability

Services for street lighting in WA are currently non-contestable as each street light is considered a separate connection and consumes less electricity than the threshold for contestable energy supply. In eastern Australia, while a monopoly electricity distributor operates in each geographic area, the existence of a number of (private sector) distributors and a much stronger role for the economic regulator means that there are more elements conducive to a competitive market.

In WA, Western Power owns the majority of public lighting assets and is responsible for the maintenance and capital works[11]. As Western Power will not allow others to attach street lights to poles it owns, only new public lighting assets where separate poles are being used are able to be owned and operated by an organisation other than Western Power.

As outlined within a letter to the Association from the Minister for Energy; Citizenship and Multicultural Interests, "extending contestability to street lights requires amendment of the *Electricity Corporations Act 2005* to provide ministerial discretion in exempting classes of exit points.[12]"

Legislative change to enable contestable provision of street lighting, as occurs in some other Australian jurisdictions, remains the policy of the Association, as such the Association has developed a submission to the Electricity Market Review recommending the required legislative change and will continue to engage in this review process.

9.1.2 Transparency

Local Governments have no visibility of what contributes to the cost of providing street lights as a service in each luminaire class. This is a key issue that need to be addressed to ensure transparent and cost reflective tariffs and to encourage contestability.

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[10] WALGA. 2011. *A Sustainable Street Lighting Project Proposal for Western Australia.* Last Accessed 17 September 2014 from http://www.walgaclimatechange.com.au/announcements/sustainable-street-lighting-project-for-western-australia

[11] PricewaterhouseCoopers (PwC). 2011. *Barriers to Energy Efficient Street Lighting.* Last Accessed 13 August 2014 from http://www.energyrating.gov.au/wp-content/uploads/Energy_Rating_Documents/Library/Lighting/Street_Lighting/PWC-2011-barriers-street-lighting.pdf

[12] Letter from Dr Mike Nahan MLA. 2014. *Contestability of Streetlight Energy Supply*

In WA, there is no direct regulation that compels Western Power or Horizon Power to make the street light tariff price transparent and readily available to the public. However, in Victoria the Australian Energy Regulator (AER) developed a calculator for their Distribution Network Service Providers (DNSP) to utilise. This detailed breakdown of all tariffs is then made publically available on the AER website when tariffs are open for public consultation.

The key reasons for advocating for additional transparency for street lighting tariffs are:

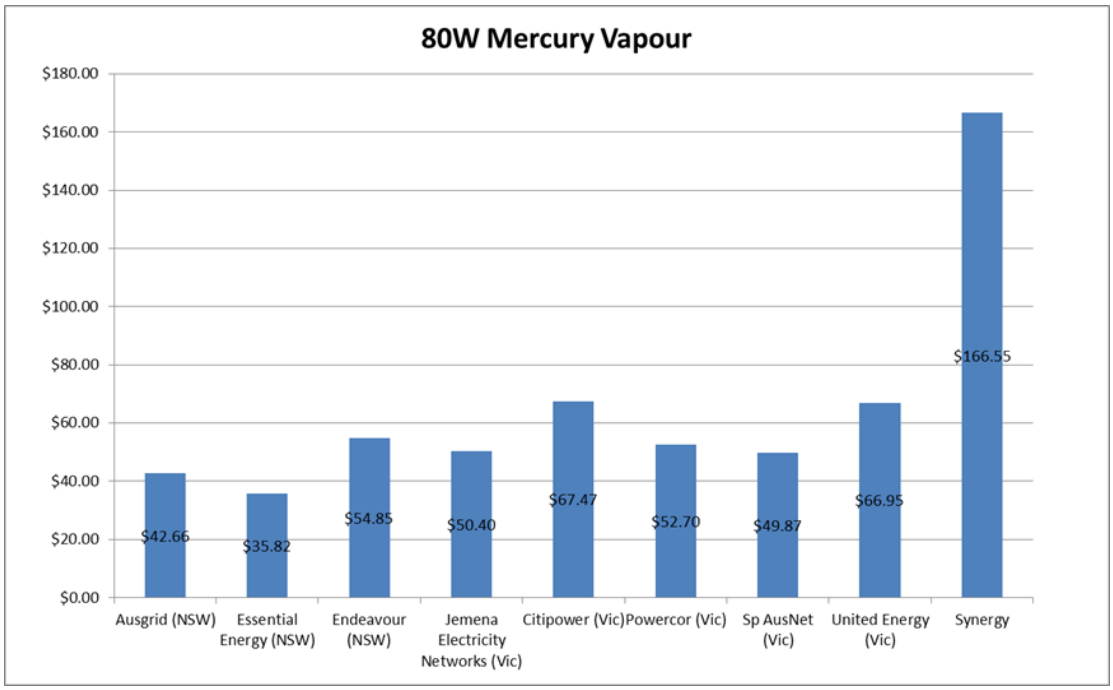
1) provide greater clarity and reasoning on proposed tariff increases;
2) to allow for benchmarking across possible suppliers that may enter the market;
3) to ensure that Local Governments have detailed information to improve their decision making for projects involving retrofitting street light with different technologies; and
4) to ensure tariffs developed for newly available technology (i.e. LED) are fair and can create competition against older technology tariffs.

9.1.2.1 Tariff comparison with other distributors

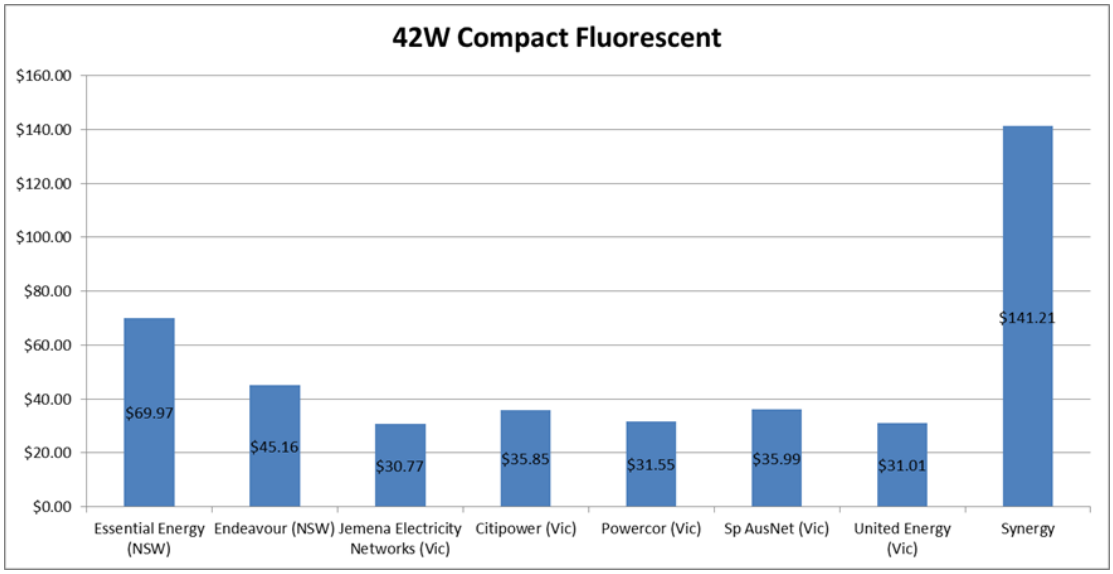
The two graphs below highlight the street light tariff comparisons between WA and the major electricity distributors operating in the National Electricity Market (NEM). The NEM interconnects five regional market jurisdictions (Queensland, New South Wales, Victoria, South Australia and Tasmania)[13].

The electricity generator and retailer in WA is Synergy. Synergy provides the billing services for the street lighting energy usage and service charges between Western Power and Local Governments.

These graphs depict the tariff (for MV and CFL) per lamp per year. It is clearly highlighted that the tariff utilised within Western Australia is much higher than in other states.



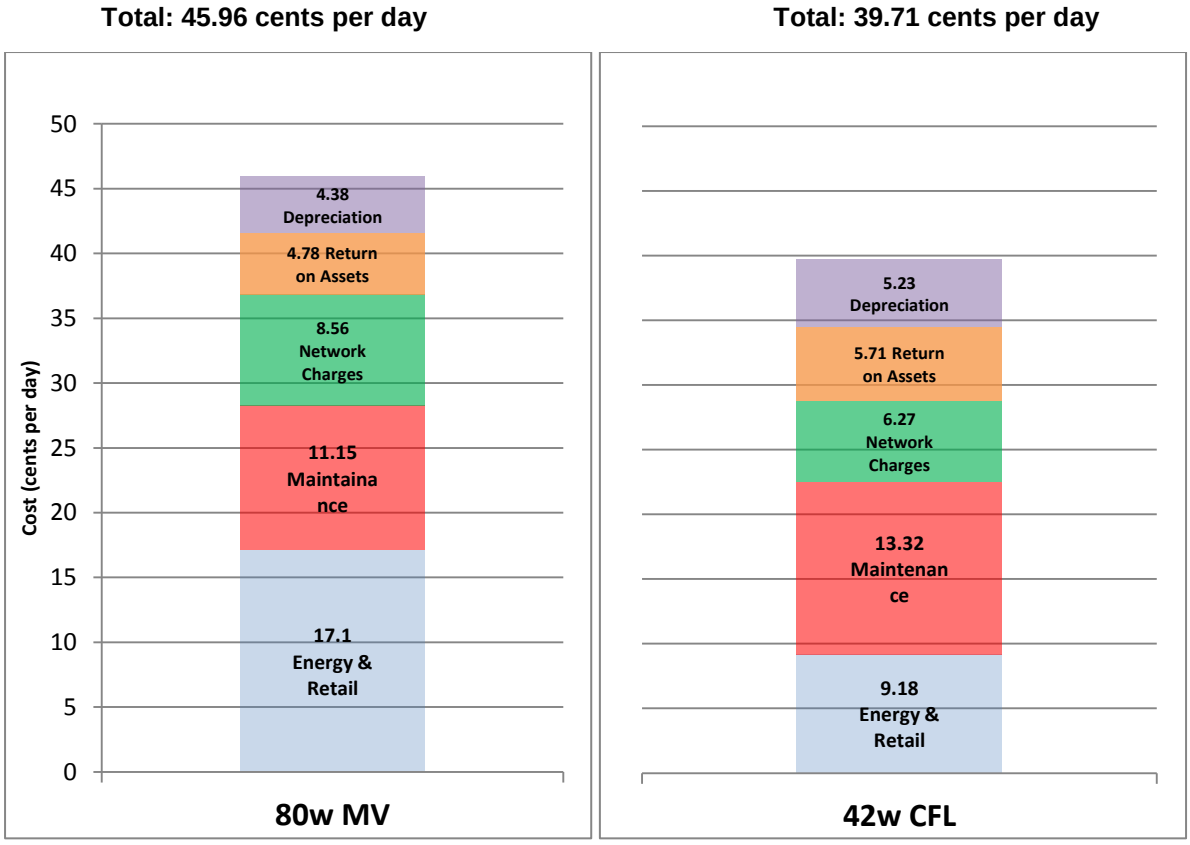
[13] AEMO. Nd. *National Electricity Market (NEM).* Last Accessed 1 September 2014 from http://www.aemo.com.au/About-the-Industry/Energy-Markets/National-Electricity-Market



9.1.2.2 WA tariff breakdown

The below information was specifically requested by the Association from Western Power in 2012/13. This breakdown does not provide adequate transparency and raised additional questions regarding price breakdown and the reasoning behind it.

The below graph indicates a 2012/13 price breakdown of the two different technologies, MV and CFL.



These graphs help to demonstrate the lack of transparency as it relates to the calculation of each element that contributes to the total overall cost. These graphs indicate that there is an increased maintenance cost, return of asset cost and an increased depreciation for CFL in comparison to the 80W MV. However, there is no explanation to why these elements are costed higher for CFL technology.

The Association has indicated within the key aims of the street lighting advocacy strategy that there could be a stronger role for the ERA in setting tariffs and ensuring greater transparency for monopoly suppliers, as undertaken by the economic regulator in other jurisdictions

9.2 Institutional

9.2.1 Australian road lighting standard

It is imperative that all street light installations comply with clear policies and standards for lighting installations and designs. The current Australian Standard for street lighting is AS/NZ 1158.6 'Lighting for roads and public spaces Part 6: Luminaires' does not currently provide for LED technology.

The prescriptive nature of the Australian Standards has created a barrier to improving street lighting energy efficiency in Australia using innovative technologies[14].

In an attempt to redress the prescriptive nature of AS/NZ 1158.6, the Standards Australia committee LG-002 is now updating the Standard. The first stage will see some reduction in the prescriptive elements and, importantly, the inclusion of LEDs. The second stage of the reform process will take longer and is expected to result in a standard that more closely reflects the international standard IEC 60598-2-3 'Luminaires for road and street lighting'.

The Association will advocate for Standards Australia to update the existing standard to include LED technology and will begin this advocacy by requesting a progress update from Standard Australia.

Discussion Question

6. Does your Local Government believe that the Association should undertake any additional advocacy actions to support changes to the current Australian Standard? If so, please provide details of your suggestion.

9.3 Funding

For Local Governments looking to retrofit or replace existing street lights with energy efficient technology, it can currently be a costly and resource intensive exercise. The cost of undertaking a street lighting bulk changeover can run into the millions of dollars[15].

In 2011, Ironbark Sustainability (Ironbark) released a Draft Street lighting Strategy that highlighted financial costs as clearly the biggest barrier for improved energy efficiency in street lighting from the

[14] Ironbark Sustainability. 2013. *Big News on LEDs and Australian Standards*. Last Accessed 10 September 2014 from http://www.ironbarksustainability.com.au/newsletter-articles/leds-and-australian-standards/

[15] Ironbark Sustainability. 2014. *Barriers Overcome: Five Stages to Change your Street Lights.* Last Accessed 19 August 2014 from http://www.ironbarksustainability.com.au/resources/news/article/barriers-overcome-five-stages-to-change-your-street-lights/?utm_source=Ironbark+Sustainability+Mailing+List&utm_campaign=53a1096b3a-Street+Lighting+Special+August+2014+%28Aus+wide%29&utm_medium=email&utm_term=0_63605c1ab8-53a1096b3a-325371049

surveyed Local Governments. Around 20 per cent of the surveyed Local Governments specifically added comments regarding upfront or capital costs being a key barrier[16].

Over the last couple of years, dozens of Local Governments across Australia were successful in receiving funding through the previous Federal Government's competitive CEEP. On top of this, funding is available through the Clean Energy Financing Corporation. Please see section 10 of this discussion paper for additional information on specific funding opportunities.

Additional to grants and individual financing options, there are two additional options available to the Local Government sector:

- large scale bulk replacement of energy efficient street lighting, and
- centralised procurement of energy efficient street lighting services and products.

Both of these options have been undertaken in Victoria. Victoria's large scale bulk replacement program has been very successful and the case study of bulk procurement of materials in Victoria shows that MAV's Street Lighting Program has seen costs come down dramatically. It has been estimated that savings from the centralised procurement of lighting products for MAV's Street Lighting Program was approximately $40 million.[17]

9.3.1 Tax recovery on gifted assets

Tax on gifted assets is an important consideration for Local Governments seeking to fund street lighting projects. Capital contributions, both cash contributions and assets that are gifted to either Western Power or Horizon Power, are treated as assessable income under Australian accounting standards. This has implications for these corporations' tax equivalent payments to the State Government and therefore adds a significant extra cost to street lighting and other projects.

As a State Government owned corporation, Western Power does not pay company tax. However, due to the competitive neutrality principles of the National Tax Equivalents Regime (NTER), Western Power must make a payment to the State Government that is equivalent to the company tax it would have incurred had the corporation been privately owned. Such arrangements are intended to ensure Government owned companies do not have a competitive advantage relative to privately owned companies.

Capital contributions increase Western Power's revenue and consequently increase the corporation's NTER liability to the State Government. The ERA made a ruling in 2012 that Western Power must recover this tax liability from the contributor. Earlier in 2014 Western Power stated they would recover this liability through a 13.9 per cent tax recovery charge on capital contributions[18]. However, soon afterwards Western Power withdrew the tax recovery charge policy and the Energy Minister is currently considering whether this policy should be implemented. Until the State Government's policy position is announced, it is unclear as to what this means for Local Governments within Western Power's network.

Horizon Power currently has a tax recovery charge in place (at a rate of 27.6 per cent) which is paid by the customer requesting customer funded works. Horizon Power has indicated that they will not

[16] Ironbark Sustainability. 2011. *Draft Street Lighting Strategy*. Last Accessed 18 August 2014 from http://www.energyrating.gov.au/wp-content/uploads/Energy_Rating_Documents/Library/Lighting/Street_Lighting/Draft-streetlight-Strategy.pdf

[17] Ironbark Sustainability. 2014. *Barriers Overcome: Five Stages to Change your Street Lights.* Last Accessed 19 August 2014 from http://www.ironbarksustainability.com.au/resources/news/article/barriers-overcome-five-stages-to-change-your-street-lights/?utm_source=Ironbark+Sustainability+Mailing+List&utm_campaign=53a1096b3a-Street+Lighting+Special+August+2014+%28Aus+wide%29&utm_medium=email&utm_term=0_63605c1ab8-53a1096b3a-325371049

[18] Western Power. 2014. *Recovering tax cost on capital contributions.* Last Accessed 20 October 2014 from http://www.westernpower.com.au/corporate-information-recovering-tax-cost-on-capital-contributions.html

absorb this tax liability as this is an established policy. This means that Local Governments on Horizon's network that utilise grant funding to assist with street lighting projects will have to consider this tax liability within the context of a project's budget. It is important to note that funds to pay for the gifted asset tax may not be included within the criteria of grant funding programs.

Discussion Question

7. Does your Local Government consider that the Association should undertake advocacy regarding tax recovery on gifted assets and the impact that it may have on future Local Government street lighting projects? If so, please provide details of your suggestion.

9.4 Access to LED technology

Ironbark's discussion paper outlines the importance of opening up the choice of lighting types[19]. Ironbark outlines this as a critical issue, as the 42W CFL is deemed to be the least efficient of several common choices of new lighting types. Western Power is installing 42W CFLs at around 10,000 to 15,000 units per annum[20].

Unlike regional Local Governments, Local Governments within the SWIS do not currently have access to LED technology. However, Western Power have highlighted previously that they are keen to investigate new energy efficient technologies, including LED technology.

The Association recently wrote to Western Power to request a progress update on the internal business case for the inclusion of LED lamps into Western Power's street light range. Western Power replied on the 19 August 2014, with an estimated timeframe for the next four stages in their process of making LED street lights available. These are:

- Undertaking technical analysis;
- Developing an Internal Business Case;
- Undertaking Supplier Tendering; and
- Establishing a LED Tariff.

Technical analysis

Within Western Power's response to the Association, they outlined the need to complete a technical analysis of the technology to ensure that the technology meets Western Power's standards. They stated that they have been working closely with their current suppliers to do this. Western Power completed this testing in mid-October 2014 and indicated that the testing confirmed LED street lights do meet their standards.

Internal business case

The second phase is the formal approval of the internal LED business case. This is dependent on the outcome of the technical testing. If there is a successful outcome from the testing, the business case can be approved shortly thereafter.

Supplier tendering

[19] Ironbark Sustainability. 2011. *Draft Street Lighting Strategy*. Last Accessed 18 August 2014 from http://www.energyrating.gov.au/wp-content/uploads/Energy_Rating_Documents/Library/Lighting/Street_Lighting/Draft-streetlight-Strategy.pdf

[20] Ironbark Sustainability. 2013. *Energy Efficient Street Lighting Opportunity, a National Perspective*.

Once the business case is approved, Western Power will conduct a competitive sourcing process for potential suppliers, with addition to the Street Light Product Range expected in April 2015.

Western Power's main supplier is Gerard Professional Solutions, previously known as Sylvania. Gerard Professional Solutions reportedly has LED capabilities. However, Western Power has indicated that they will still be undertaking a tendering process for suppliers.

LED tariff

Finally, a new LED street lighting tariff will have to be established. Western Power has been concurrently engaging with Synergy regarding the development of the tariff. This new tariff will need to be approved by the ERA. It is unsure whether this tariff will relate to the already existing LED tariff in Horizon Power's regional network.

The Association will continue to monitor the progress of the internal business case for LED lighting, and will provide updates to the sector as they become available.

Discussion Question

8. Would your Local Government consider a project to retrofit LED street lighting technology, if it was made available to the sector with a reasonable associated tariff?
9. Does your Local Government believe that the Association should undertake any advocacy actions to assist Western Power to provide access to LED technology for Local Government in the SWIS? If so, please provide details of your suggestion.

9.5 Access to expertise

One key barrier for Local Governments considering street lighting projects is access to technical specialist to assist with these projects. This has now been alleviated with the development of a number of the Association's Preferred Supplier Panels.

The Association's Preferred Supplier Panel now provides a solution to requiring all technical expertise to be housed internally in Local Governments. Each Preferred Supplier on the Association Panel has had their product independently tested and certified to relevant Australian Standards.

Relevant panels include LED Luminaries, Environmental Consulting and Sustainability Services and Energy: Sustainable Energy Infrastructure, which includes a category for Street Lighting Infrastructure.

The Association's current panel of suppliers for LED Luminaires comes to term in June 2015 with extension options. The Association will review its next panel term in context of the Western Power activity and broader market development to facilitate Local Government direct purchasing of street lighting infrastructure, where appropriate.

For more information or to view all of the Association's Preferred Supplier Panels please visit http://walga.asn.au/ProductsandServices.aspx.

Discussion Questions

10. Is your Local Government aware of the Association's Preferred Supplier Panels?
11. If so, has your Local Government accessed this service for street lighting projects?

Discussion Questions

12. Can you identify any additional barriers to Local Governments accessing energy efficient street lighting technology? If so, please include details.
13. Has your Local Governments attempted an energy efficient street lighting project? If so, what were the barriers that you faced?

Case study 4: Seattle

Seattle's publicly owned utility, Seattle City Light, is converting its residential street lights from high-pressure sodium lights to LEDs. The decision was made after thorough evaluation and positive results from pilot projects. Seattle City Light has characterised the benefits of LED conversions as:

- Approximately 48 per cent to 62 per cent lower energy consumptions;
- High-pressure sodium luminaires, installed in the mid-1980s, are at the end of their useful lives and are failing. LEDs will provide better service reliability and lower maintenance costs;
- Reduction in greenhouse gas emissions: in manufacturing, when LEDs are in use, and fewer service vehicle trips for repairs will mean a reduction of about 20,000 tonnes of carbon each year;
- Replacement of luminaires with LED fixtures will provide three to four times longer field life than high-pressure sodium;
- LEDs are not affected by truck and roadway structure vibration;
- Better light quality (whiter/cooler colour rendering);
- Light quality improves safety because of depth of field and peripheral vision enhancement without distorting colours.

The utility has estimated the simple payback for LED conversion of residential lights at 7.7 years. Once all residential fixtures have been replaced, they will save the City an estimated $2.4 million in annual energy and maintenance costs.

10. Funding Opportunities

There are a number of funding opportunities that could be utilised for Local Government LED street lighting projects, once the barriers of accessing the technology are removed. Some of the most prominent funding opportunities for the Local Government sector are listed below.

10.1 Emission Reduction Fund

The main pillar of the Federal Government's Direct Action Plan is the Emission Reduction Fund. Through a reverse auction mechanism, the Emission Reduction Fund aims to provide incentives for emission reduction activities across the Australian economy[21].

This opportunity was a suggestion within the Association's submission to the Emission Reduction Fund – Green Paper. The Federal Government has publicly outlined that aggregated street lighting projects will be suitable for inclusion, if they reduce a specific tonnage of carbon emissions.

The legislation supporting the mechanism for this fund has recently been passed through the Senate with amendments; this amended version will have to be passed again through the House of Representatives. This process is expected to be completed in early 2015. Additionally, a methodology relating to street lighting will need to be developed prior to any projects being approved through the Emission Reduction Fund.

Discussion Questions

14. Is your Local Government aware of the Emission Reduction Fund; if not would you like some additional information on the opportunities that it may present?
15. Does your Local Government believe that there are barriers to engaging with the Emission Reduction Fund?
16. If so, what role can you see the Association playing to improve engagement? Please provide details.

10.2 Co-financing through the Clean Energy Financing Corporation

The Clean Energy Financing Corporation (CEFC) invests using a commercial approach to overcome market barriers and mobilise investment in renewable energy and lower emissions technologies[22].

With access to LED technology, WA Local Governments could access CEFC financing and implement projects that have significant energy and cost savings, as well as reducing greenhouse gas emissions.

One example highlighting this option is the City of Warrnambool in Victoria. Warrnambool is set to become the first Australian Local Government to complete a bulk changeover of residential street lighting to LEDs, using financing from the CEFC. The city is set to reduce its street lighting costs by almost 70 per cent by replacing about 2,000 MV lamps with LEDs following the recent approval of the technology by local network provider Powercor[23].

[21] Department of the Environment. 2014. *Emission Reduction Fund.* Last Accessed 17 September 2014 from http://www.environment.gov.au/climate-change/emissions-reduction-fund
[22] Clean Energy Financing Corporation. 2014. *About us.* Last Accessed 17 September 2014 from http://www.cleanenergyfinancecorp.com.au/about-us.aspx
[23] Clean Energy Financing Corporation. 2014. *Warrnambool saves with street light upgrade*. Last Accessed 17 September 2014 from http://www.cleanenergyfinancecorp.com.au/our-investments/case-studies/council-saves-on-street-lighting-costs.aspx

10.3 State Underground Power Project (SUPP)

The SUPP is a State Government initiative administered by the PUO at the Department of Finance[24].

Local Governments can nominate areas to be converted to underground power. Each nomination is assessed against social, economic and technical criteria by the SUPP Steering Committee[25]. Within this project the State Government and Western Power will fund 50 per cent, whilst the other 50 per cent is covered by the Local Government.

Western Power has been replacing lighting as part of the SUPP. By the end of 2013, around 40,000 42W CFLs had been installed to replace the existing 80W MV lighting. It is expected that they will continue at a rate of around 10,000 -15,000 luminaries each year[26].

There is currently no understanding that LED lights will be installed within SUPP if they become available, only that CFL will be installed as the street lights are replaced. However, it is possible that if LED technology does become available, that this may be a potential opportunity.

Discussion Questions

17. Would your Local Government be interested in participating in the State Government's SUPP project in the future?

10.4 Ad hoc retrofits by individual Local Governments

There are other additional funding methods available to Local Governments. This can include gaining access to funding through other measures, such as revolving energy funds.

It has been highlighted to the Association, that some Local Governments have developed revolving sustainability funds. These funds can generate one-off funding for a project like retrofitting street lights. Calculated savings are then reinvested into the fund to finance further projects. If the Association is successful in navigating the main barriers regarding street lighting then this type of project would become an option for councils in this position.

Discussion Questions

18. If your Local Government has developed a revolving energy fund, would you consider it to be successful, and are there any particular learnings that you would share with any Local Governments considering a similar project in the future?

10.5 Debt finance

Another option for Local Governments is the use of debt for street lighting projects. A bulk replacement project for street light luminaires involves significant upfront installation and replacement costs. These costs may include paying out the utility provider's remaining allocation for depreciation on street lighting assets that are being replaced before the end of their useful life. In contrast, the savings from improved street lighting technology are realised over several years in the form of lower tariffs.

[24] Western Power. 2014.*State Undergrounding Power Program (UPP).* Last Accessed 17 September 2014 from http://pdc-cmsdgp02.westernpower.com.au/network-projects-your-community-state-underground-power-program-upp-.html
[25] Western Power. 2014. *State Undergrounding Power Program (UPP)*. Last Accessed 17 September 2014 from http://pdc-cmsdgp02.westernpower.com.au/network-projects-your-community-state-underground-power-program-upp-.html
[26] Ironbark Sustainability. 2013. *Energy Efficient Street Lighting Opportunity, a National Perspective*.

The use of debt can ameliorate the effects of such 'lumpy' infrastructure expenditure by spreading the project costs over time. A Local Government's borrowings for a street lighting replacement project could then (notionally) be serviced by the savings made from lower tariffs. However, the reduction in tariffs needs to be carefully assessed to ensure that a debt financed street light replacement project will deliver net benefits to Local Governments, i.e., the overall saving in tariff costs needs to at least fully fund loan repayments (including interest).

Furthermore, there is the also the issue of which costs a Local Government should be liable for in a bulk replacement process. While the utility provider could reasonably be expected to be compensated for retiring assets ahead of schedule, other capital costs – such as replacing housings and control mechanisms to accommodate new luminaires – may be more contentious. Arguably, such costs should be included in the tariff for the new street lighting technology rather than being included in the upfront charges to Local Governments. This is because the utility provider would probably incur these costs anyway when the old street lights were replaced at the end of their useful life.

Finance for street light replacement projects could be provided by the WA Treasury Corporation (WATC). The WATC are the main lender to WA Local Governments for infrastructure projects. Local Governments have often used loans from the WATC to finance their portion of SUPP project costs.

Discussion Questions

19. Would your Local Government consider utilising debt financing for future street lighting projects?
20. Would you like the Association to provide additional information on debt financing to the Local Government sector?

Discussion Questions

21. Was your Local Government previously aware of any of the funding opportunities outlined in the above section?
22. Are you aware of any additional funding opportunities that could be utilised to undertake an energy efficient street lighting project? If so, please include details.
23. Is there a particular model of funding that your Local Government suggests that the Association should advocate for at a State Government level? If so, please provide details.

11. Draft Action Plan

To support the main aims outlined in this discussion paper, the Association aims to develop an action plan. The Association would like to gather feedback from the Local Government sector on the development of advocacy actions.

Please note that the below list of action items, are a suggested way forward only. Actual actions for the Association will be decided and finalised after the consultation period with the Local Government sector.

Draft Actions
Policy Development
The Association develop a policy position on energy efficient street lighting, to be endorsed by State Council, with the four key aims of this paper outlined.
The Association develop an Energy Efficient Street Lighting Advocacy Action Plan to support the agreed main aims of this discussion paper.
The Association liaise with the Australian Local Government Association (ALGA) to advocate for the development of a street lighting methodology for the Emission Reduction Fund.
The Association develop a Community Engagement Strategy to inform the sector of the current status of energy efficient street lighting and encourage sectorial participation in advocacy actions outlined as appropriate.
Information/ Research
The Association write to Australian Standards requesting a timeframe for their updates to the standard to include LED technology.
The Association write to Western Power to request information on the progress of the LED internal business case and the supplier tendering process.
The Association write to the Public Utilities Office (PUO) requesting information on costs related to retrofitting LEDs within future installations associated with the SUPP.
Communication
The Association continue to promote and communicate available funding opportunities to the sector as they arise.
The Association's Climate Change Coordinator update the Climate Change Management Toolkit to include a: - dedicated page to energy efficient street lighting; and - a Local Government LED street lighting retrofit case study with detailed information on the process and the potential financial savings.
The Association utilise their Preferred Supplier Panels to provide information on emerging technology and alternative solutions regarding energy efficiency into an information booklet to be released to the sector.
The Association host a policy forum/street lighting workshop for the sector to discuss: - progress of action items; - bulk scale replacement opportunities; - case studies including CEFC Warrnambool;[27] and - possible exhibitor opportunities
Collaboration
The Association meet with relevant industry agencies such as IPWEA, Sustainable Energy Association (SEA) and Ironbark Sustainability to discuss this discussion paper and explore future opportunities for collaboration.

[27] Clean Energy Finance Corporation. 2014. *Council saves on street lighting costs.* Last Accessed on 20 August 2014 from http://www.cleanenergyfinancecorp.com.au/our-investments/case-studies/council-saves-on-street-lighting-costs.aspx

The Association meet with Urban Development Institute of Australia (UDIA) to discuss the Gifted Asset Tax and investigate whether there are any ways forward including possible political engagement.
The Association request a meeting with the Minister of Energy to discuss the four key points of this strategy and investigate any possibilities of State Government assistance, partnership or support.

Discussion Questions

24. Do you support the possible action items suggested above?
25. If asked to rate, what would be your preferred five actions?
26. What additional action items would you suggest that the Association undertake to support the main aims of this discussion paper? Please provide details.
27. Can you identify any potential issues with the proposed above actions?
28. Would your Local Government support relevant advocacy actions, if they required specific Local Government support?

12. Conclusion

Managing minor and residential street lighting is core business for the Local Government sector. In recent years, Local Government has become increasingly interested in improving street lighting performance. There is a growing push to improve amenity, control rapidly rising electricity costs and reduce energy consumption and consequent greenhouse gas emissions.

The Association, through this discussion paper, seeks to support the Local Government sector to have access to energy efficient street lighting opportunities.

13. Feedback Template

Please use the detached submission template on WALGA's Climate Change Management Toolkit to provide your feedback to the Association. Editable electronic submissions (i.e. MS word, not PDF) are preferable.

Options to submit your feedback are:

- Email: cperks@walga.asn.au
- Post: Attention - Climate Change Coordinator, Western Australian Local Government Association, ONE70, Level 1, 170 Railway Parade, West Leederville WA 6007
- Fax: (08) 9213 2077

Appendix 1 - Glossary

AER	Australian Energy Regulator
AS/NZS 1158	Australian and New Zealand standards for lighting for roads and public spaces
CEEP	Community Energy Efficiency Program (now closed)
CEFC	Clean Energy Financing Corporation
CFL	Compact fluorescent lamps are a fluorescent lamp designed to replace HID and Incandescent lamps
DNSP	Distribution Network Service Providers
Distributor	A person who holds a distribution licence. In WA, Western Power or Horizon Power
ERA	Economic Regulation Authority
Greenhouse Gas (GHG) Emissions	Typically in tonnes of CO_2 equivalent
HID	High Intensity Discharge (HID) street lighting makes up the majority of Australia's current street lighting inventory. There are three common varieties of HID lamps: High Pressure Sodium (HPS), Metal Halide (MH) and Mercury Vapour (MV). Of these, MV is the most inefficient
HPS	High Pressure Sodium lamp
Lamp	The lamp emits light and is located within the luminaire (lantern)
LED	Light Emitting Diode
Luminaire	A device that distributes, filters or transforms the light emitted by a lamp or lamps and which includes all the items necessary for fixing and protecting these lamps
MH	Metal Halide
MV	Mercury Vapour
NTER	National Tax Equivalents Regime
NEM	National Electricity Market. The NEM interconnects five regional market jurisdictions (Queensland, New South Wales, Victoria, South Australia and Tasmania)[28].
NWIS	North West Interconnected System
PUO	Public Utilities Office
SWIS	South West Interconnected System
T5	A new tubular fluorescent lamp providing lower energy use than most current lamps
WA Treasury Corporation	WA Treasury Corporation

[28] AEMO. Nd. *National Electricity Market (NEM).* Last Accessed 1 September 2014 from http://www.aemo.com.au/About-the-Industry/Energy-Markets/National-Electricity-Market

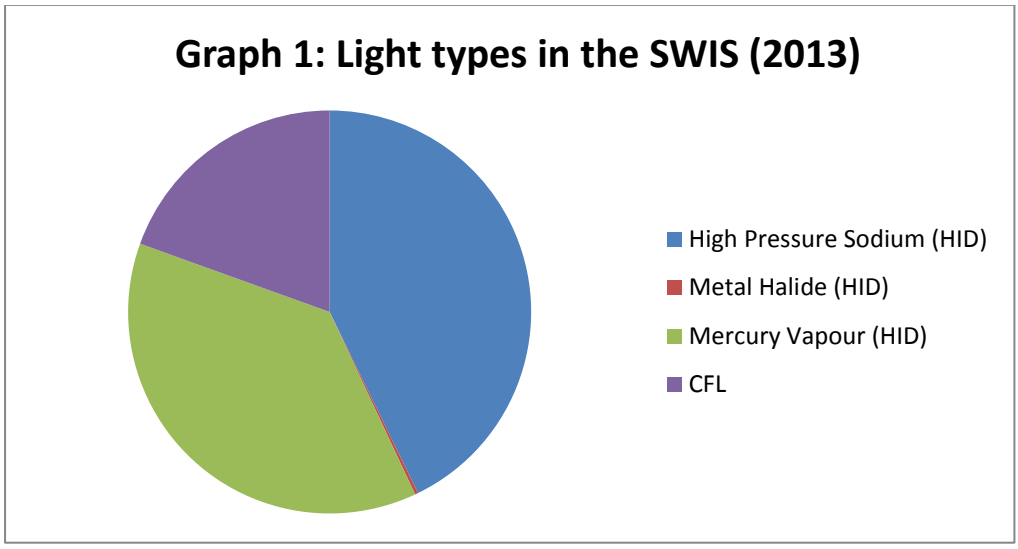
Appendix 2 – The Association's Past Policy Resolutions: Street lighting

Res No	Title	Key Points	Date
Dec 2003	**Improved Street Lighting**	That Improved Street Lighting for Greenhouse and Safety Project conducted in partnership with the Sustainable Energy Development Office (SEDO) be endorsed	Dec 2003
143.6/2006	**Street lighting**	1. the Association continues its strong Advocacy in relation to the contestability of street lighting and request the Minister for Energy: Science and Innovation to ensure that the WALGA is part of the review into the implementation of electricity full retail contestability in 2007 to ensure that street lighting is made a fully contestable item giving possible major savings to Local Government; 2. That the Association continue to raise its concerns with Synergy in relation to the current Street Vision agreements for street lighting and strongly advocate that Western Power assume street lighting assets.	Dec 2006
358.2/2008	**Improved Street lighting Study for Greenhouse and Safety Benefits – LG Recommendations**	That State Council endorse the following recommendations, designed to increase awareness and implementation of sustainable street lighting policy and practice for Local Governments: • the Association encourage Local Governments to adopt AS/NZS 1158 as a policy for technical design of street light networks; • that the Association encourage Western Power and Local Governments to use the more efficient lamp technologies in new and replacement street lights; • that the Association pursue Synergy to provide a price breakdown listing the initial cost of changeover, maintenance, replacement, energy and administrative costs to individual Local Government clients; • that the Association pursue the Office of Energy to encourage energy efficient street lighting for underground power program projects, and specify appropriate AS/NZS 1158 Categories; • the Association request Synergy and Western Power to include fluorescent lamps such as compact fluorescent and T5 fluorescent lamps in the available stock; and • that use of MV lamps at 80m spacing should be phased out in a manner that does not impact on the waste stream.	April 2008

Appendix 3 - Street lighting Technologies

High Intensity Discharge (HID) street lighting makes up the majority of Australia's current street lighting inventory. There are three common varieties of HID lamps: HPS, Metal Halide (MH) and MV. Of these, MV is the most inefficient.

Graph 1 highlights the breakdown of the different technology used in the Western Australian SWIS, as of December 2013[29].



Australia wide, the majority of the MV residential street lights could be replaced by T5, CFL or LED lamps street lights, which reduce energy usage by 68 per cent, 52 per cent and 77 per cent respectively[30].

LED

Due to longevity, controllability and efficiency, LEDs are now an attractive substitute for convention MV, HPS, metal halide and linear and compact fluorescent technologies used in minor roads and other public spaces. A further major advantage is that LEDs do not contain the toxic substance mercury[31].

Internationally, 27 of the 30 largest LED street lighting implementation projects are owned by Local Governments or are being delivered by a specialist street lighting service provider for a Local Government[32].

Horizon Power has been installing LED lighting in remote communities because of their robust nature. The frequency of maintaining these is lower than other light types and given the great distances travelled to undertake maintenance means this is very cost effective.

[29] Ironbark Sustainability. 2013. *Energy Efficient Street Lighting Opportunity, a National Perspective*.
[30] WALGA. 2012. *Streetlighting Bulk Replacement Program, Business Case*. Last Accessed 1 September 2014 from http://www.walgaclimatechange.com.au/announcements/sustainable-street-lighting-project-for-western-australia
[31] Douglas, B. 2014. *LEDs set to improve sustainability of Australia's street lighting.* Sustainability Matters. Last Accessed 23 October 2014 from http://www.sustainabilitymatters.net.au/articles/67522-LEDs-set-to-improve-sustainability-of-Australia-39-s-street-lighting .
[32] IPWEA. 2014. *Towards More Sustainable Street Lighting.* Last Accessed 24 October 2014 from http://info.ipwea.org/towards-more-sustainable-street-lighting.

CFL

CFL's utilise the same technology as traditional linear fluorescent tubes. Their size to light output ratio is much higher, allowing them to be used in more conventional sized light fixtures. In many case, they can be retrofitted into existing HID lights.

T5

The basic technology behind T5 Linear Fluorescent lamps is really no different to the typical fluorescent lamps that have been around for decades. T5 technology has allowed for fluorescent lamps to be made small enough and energy efficient enough to be able to out-compete MV lights.

The 'Greenstreet T5' provides an alternative (and more energy efficient) option to the CFL. There are now three alternative T5 products. T5s are currently the energy efficient replacement option of choice in Victoria (around 80-90 per cent of installations over the past few years).

Table 1 - WA energy saving opportunities minor road lighting

The below table outlines the energy savings for replacing minor road lighting in 2013, also known as residential street lighting[33].

Light type	W	Capital cost to replace		Greenhouse savings (tCO_2-e, 20 years)			Cost of abatement ($/$tCO_2$-e saved)		
		T5/CFL	LED	T5	CFL	LED	T5	CFL	LED
High Pressure Sodium	70	$49,245	$62,391	489	370	548	$101	$133	$114
	100	$569,400	$721,396	5,650	4,280	6,335	$101	$133	$114
Mercury Vapour	50	$127,721	$161,814	1,267	960	1,421	$101	$133	$114
	80	$39,326,146	$49,823,885	390,214	295,617	437,513	$101	$133	$114
	125	$3,059,685	$3,876,438	30,360	23,000	34,040	$101	$133	$114
Approx. Totals		**$43,132,197**	**$54,645,925**	**427,980**	**324,227**	**479,856,000**	**$101**	**$133**	**$114**

Efficient Controls - Dimming

Dimming can offer energy savings and reduction of greenhouse gas emissions. While dimming does reduce the amount of light on the road, the intent is to dim road lighting when activity levels are low.

Dimming is most effective on the high wattage lamps used to light major roads. Energy savings of up to 50 per cent appear possible with dimming of road lighting[34].

The best candidate luminaires for diming are the high power luminaires, particularly the 250W HPS. Sage Consulting continues that "it is a better investment to replace the 80W MV luminaires with 42W CFL than to consider dimming.[35]"

[33] Ironbark Sustainability. 2013. *Energy Efficient Street Lighting Opportunity, a National Perspective*.
[34] Sage Consulting. 2012. *Report on Dimming of Road Lighting*

Appendix 4 – Key Stakeholders

Western Power

Western Power's purpose is "connecting people with electricity."[36] However it does not generate electricity and/or retail electricity (like Synergy). Western Power operates in SWIS areas of Western Australia. Over 227,000 street lights are managed by Western Power and therefore they control 90 per cent of public lighting in Western Australia.

Western Power mainly owns the street lighting assets in a Local Government area (unless some street lights are owned specifically by the council, which is limited) and undertakes the maintenance of these assets.

Horizon Power

Horizon Power is a State Government-owned, commercial-focused corporation. It is responsible for generating, procuring, distributing and retailing electricity supplies.

Horizon Power manages 38 systems: the North West Interconnected System (NWIS) in the Pilbara and the connected network between Kununurra, Wyndham and Lake Argyle, and 24 stand-alone systems in regional towns and remote communities.

Local Government

Local Governments are legally responsible for providing street lighting in Australia (on minor roads) and paying for the energy use and maintenance of street lighting, however the majority of street lights are owned and maintained by the electricity distribution utilities[37].

Emissions from street lights are reported to account for up to 50 per cent of Local Government's total greenhouse gas emissions. Generally, Australian Local Governments allocate approximately 50 per cent of their energy budgets to minor road street lighting[38].

Public Utilities Office (PUO)

The Department of Finance – PUO provides a range of services on energy matters to the Minister for Energy, the Western Australian Government, the energy sector and the Western Australian community.

Initially with responsibility for energy policy, the Public Utilities Officer will, through economies of scale, provide a focuses service for Government and enhance an industry wide perspective.[39]

Economic Regulation Authority (ERA)

[35] Sage Consulting. 2012. *Report on Dimming of Road Lighting*
[36] Western Power. 2014. *About us*. Last Accessed 1 September 2014 from http://www.westernpower.com.au/aboutus/aboutus.html
[37] ACELG. 2014. *LED Street Lights save money, Carbon Emissions and Lives.* Last Accessed 1 September 2014 from http://www.acelg.org.au/news/led-street-lights-save-money-carbon-emissions-and-lives
[38] WALGA. 2012. *Streetlighting Bulk Replacement Program, Business Case*. Last Accessed 1 September 2014 from http://www.walgaclimatechange.com.au/announcements/sustainable-street-lighting-project-for-western-australia
[39] Department of Finance. 2014. *About us.* Last Accessed 13 August 2014 from http://www.finance.wa.gov.au/cms/content.aspx?id=13633

The work of the ERA is important to ensure that WA has a fair, competitive and efficient environment for consumers and businesses. The ERA also undertakes inquiries with the aim of improving the performance and productivity of the economy and provides independent advice to the State Government.

"An economic regulator is especially important in Western Australia because our state is isolated and we have a relatively small population spread over a large area. This means that for several essential services, real competition is not economically viable so the suppliers in these areas effectively operate as monopolies."[40]

The ERA aims to reduce compliance costs and promote efficiency to benefit all parts of the community in the long and short term.

Synergy

Synergy is a corporation owned by the Government of Western Australia. Synergy is an electricity generator and retailer in WA's SWIS and provides the billing services for the street lighting energy usage and service charges between Western Power and Local Governments[41].

[40] Economic Regulation Authority. 2014. *About us.* Last Accessed 13 August 2014 from http://www.erawa.com.au/about-us
[41] Western Power. 2010. *Streetlights Bulletin*. Last Accessed 6 October 2014 from https://services.westernpower.com.au/online/streetlights/factsheets/Streetlights_Bulletin_Issue_3_January_2010.pdf;jsessionid=5564e70b0966c021f890329867d7:5OPr