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Attachments:

   A - Project Energy Efficiency Improvements
   B - Calculation of Energy Efficiency Outcomes
   C - Evaluation Report
   D - Postcodes of Suburbs Lighting Changeover
   E - Declaration Page
1. Executive summary

The Western Sydney Light Years Ahead project was a community energy efficiency project on a major scale that saw 13,951 high emission mercury vapour street lights replaced with modern, energy efficient light emitting diodes (LEDs).

This project has been – by a significant margin – the largest energy reduction project in Western Sydney’s history; it was implemented across nine local councils, with lights being replaced in 136 suburbs. The total cost of the upgrade was $7,891,792 with $5.2 million in grant funding from the Australian Government’s Department of Industry, Innovation and Science, and $2.6 contributed by the participating councils: Blacktown, Blue Mountains, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and The Hills Shire.

Each light changed represents a 77 per cent reduction in electricity costs. These are savings that have started to flow through to the councils, ratepayers and the broader community.

The Light Years Ahead project has reduced the energy usage of participating councils by over 4.4 million kWh a year, which will result in $18.30 million in energy savings and a reduce greenhouse gas emissions by over 85 thousand tonnes over the next 20 years.

In addition to offering lower costs, lower energy consumption, and lower greenhouse gas emissions, the new lights provide better lighting outcomes for the community, including a greater uniformity of light; better colour rendering and visibility; less depreciation of the light output over time; and lower glare.

The project’s core capital replacement work was supported by a range of communication and engagement activities. The flow-on benefits from these activities proved to be crucial to the wider program.

The communications effort helped to raise awareness of energy efficiency within the Western Sydney community and stimulated active consideration of implementing energy efficient products and practices within households.

"I've never had anything to do with WSROC before. It's been a great experience. You feel like you're not chipping away on your own.”

- Project Stakeholder
Photo credit: Jay La. Project Launch (Mayor Kim Ford (Hawkesbury), Fiona Scott MP (Lindsay), WSROC President Cllr Tony Hadchiti, Mayor Greg Cummings (Holroyd), Louise Markus MP (Macquarie), Hon Karen Andrews MP (Parliamentary Secretary to the Minister for Industry and Science), Mayor Ross Fowler OAM (Penrith) [left to right]
2. Project objectives

The project aimed to address the objectives as outlined in this section.

The Australian Government’s Department of Industry, Innovation and Science’s objectives (as listed under its Community Energy Efficiency Program) included:

• Support a range of local councils and community organisations to increase the energy efficiency of different types of non-residential council and community-use buildings, facilities and lighting; particularly where this would benefit low socio-economic and other disadvantaged communities or support energy efficiency in regional and rural councils.

• Demonstrate and encourage the adoption of improved energy management practices within councils, organisations and the broader community.

The Light Years Ahead project objectives were to:

• Deliver energy efficiency improvements to Western Sydney councils’ public street lighting which leads to carbon emission reduction and cost saving.

• Develop and implement educational and engagement tools and materials to ensure that key stakeholders and the Western Sydney community benefit and learn from the project activities during the project and beyond.

• Showcase the Western Sydney region as a frontrunner on energy efficiency.

• Set an example to our residents to change to low emission light bulbs.

• Advocate on behalf of our councils to ensure they have some control over their energy usage.

From the onset, and as stated in the initial project plan, the Light Years Ahead project aimed to replace 12,770 inefficient street lights with more energy efficient models, achieving 66 per cent energy reduction.

Due to improvements in technology and price negotiations by WSROC, an updated business case was developed, including latest available technology and data, lower capital costs and more energy efficient options.

From then onwards, the project aimed for higher outcomes, replacing 13,000 lights and achieving a 77 per cent energy reduction.¹

The lighting installation was supported by a communication and marketing program to promote the project and to increase the community’s knowledge of energy efficiency.

¹ For reporting purposes – project outcomes will be evaluated against the initial project plan outcomes (12,770 lights to be replaced and 66 per cent energy reduction achieved).

“Our kids were engaged and interested. I think the messages the students got were about sustainability and particularly about energy saving.”

- School teacher who attended the Light Years Ahead workshop at the Youth Eco Summit
The project was further guided by the following requirements:

- Maximisation of energy savings within project budget;
- Maximisation of greenhouse gas reduction;
- Reduction in council electricity costs;
- Sharing the learnings and promoting energy efficiency with the community;
- The use of approved, safe and thoroughly assessed lighting technologies;
- Requirement of safe and efficient work practices;
- Design based on Australian Standards (AS/NZS 1158);
- Considering above-standard lighting in areas of crime and public safety concern;
- Community information and education that aims to:
  - Communicate information on the benefits of the project to residents in saving energy and reducing greenhouse emissions; and
  - Engage with industry (in particular the Distribution Network Service Provider, Endeavour Energy and lighting manufacturers) by demonstrating how these projects can be successful.
Photo credit: Endeavour Energy. Endeavour Energy crew installing the first street lights of the project
3. Project energy efficiency activities

The project involved the replacement of a minimum of 13,300 inefficient 80 Watt mercury vapour (MV) lamps to 18 Watt LEDs in Category P (residential) streets throughout Western Sydney.

Nine Western Sydney Councils participated in the Light Years Ahead project: Blacktown, Blue Mountains, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and The Hills.

3.1 LED technology

LED technology has developed rapidly over the last five years. From a position where the upfront costs were prohibitively expensive, costs have now reduced dramatically and the size and reliability of savings have improved significantly.

In their landmark 2012 report, Lighting the way: Perspectives on the global lighting market, McKinsey & Co predicted that the price of LEDs would reduce by around 14% per year between 2010 and 2015.

Indeed, over the last four years, costs have fallen even faster than expected and by 2020, LED streetlights are expected to reach cost parity with legacy technologies, making their benefits to costs immediately positive. Furthermore, with many countries rapidly urbanising and in need of improved street lighting infrastructure, this has created an enormous market opportunity. Between 2015 and 2025, LED street lighting investment is projected to cumulatively reach $57.8 billion\(^2\) of global investment pipelines which has already resulted in improved technology and cost reductions.

The key reasons for the decrease in prices are technology advancement and increased competition. Firstly, LED lighting is considerably more efficient than traditional lighting technology, which means that consumers can significantly reduce energy use.

This is expected to continue with key international bodies\(^3\) stating that while it can be difficult to predict the speed at which the technology will develop, LEDs are predicted to increase in efficiency over the coming decade.

Prices are also falling through market forces. All large lighting manufacturers are spending significant money and resources on research and development and marketing of their LEDs. As competition increases, prices are decreasing. Through WSROC, nine councils in Western Sydney have joined forces to reap the benefits of this technology development, which has seen large reduction in capital costs.

Finally, LED technology is also considerably better from an on-going maintenance perspective. The life of LED luminaires (10-20 years) are substantially longer than MV lamp (3-4 years)\(^4\).

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\(^3\) For example, the US Department of Energy.

\(^4\) Note that High-Intensity Discharge (HID) sources such as MV have readily replaceable lamps while the luminaires can last 20 years or longer. For LEDs, typically the entire luminaire is replaced (at 10 to 20 years).

Photo credit: Jay La. WSROC President Cllr Tony Hadchiti speaks at the Parramatta City Council project launch.
Photo credit: Jay La. 18W LED light as used for the program
3.2 Implementation

The lights were installed by Endeavour Energy, a state-owned electricity infrastructure company that owns, maintains and operates the electrical distribution networks for greater Western Sydney and the Illawarra region of NSW, Australia. Endeavour Energy was responsible for both supply and installation of the new lights.

Installation was uncomplicated with the exception of minor disruptions (see below). From a technological point of view this is one of the most straightforward projects a council, funding organisation or distributor can implement. It is simply changing one type of light to another 13,951 times. It's as easy as 1-2-3 (see figure 1).

Site and technology specific problems

Overall the installation was a success and the project was implemented very smoothly. There were a few minor issues, which are to be expected in a project of this size and scale:

- Severe storms in January 2016 halted work. This put the installation crew slightly behind schedule. However, since the project was ahead of schedule by 7 weeks, this did not delay the overall delivery of the project.
- Less than ten complaints were received during the course of the project. This is a very low number considering the scale of the project and can be attributed to the extensive communications efforts the project implemented. The main complaints were about the brightness of the new lights (either too bright or not bright enough) and lighting spill onto private property. All complaints were handled promptly and effectively by the respective councils. WSROC and its technical consultant provided support when required. A formal complaints procedure suite of templates was developed by WSROC at the start of the project for councils to use.
- It was initially difficult to find a contractor that would collect and recycle plastics from the old 80 W MVs. In September 2015, Endeavour Energy managed to contract Plastic Industrial Company Pty (PIC) to collect and recycle the plastics at PIC’s recycling plant. In total, the project ensured that 5,040 tonnes of waste was diverted from landfill.
Photo credit: Jay La. Students at the Youth Eco Summit displaying their sustainable house designs.
4. Project demonstration and communications activities

The project team worked closely with the participating councils in driving and championing communication with stakeholders and the Western Sydney community. WSROC was the lead organisation for all communication activities, which ensured that the project’s communication and messaging was consistent at all times.

The effective stakeholder relationship with its councils enabled WSROC to leverage existing council communication channels and education activities such as annual events, media opportunities and community newsletters.

The WSROC project team worked closely with the following council teams: environmental sustainability, media and communications, engineering and asset management, events and communications.

The drivers behind all communications activities were to:

- Demonstrate the project’s results;
- Raise awareness of energy efficiency through the project;
- Raise the profile of WSROC, councils, and Federal Government within the Western Sydney community. With the project considered as a showcase or case study;
- Engage with target stakeholders to share knowledge, experiences and lessons learnt;
- Ensure the widest dissemination of knowledge from the project;
- To encourage widespread changes in attitudes and behaviour in the community with regard to efficient use of energy; and
- To develop stronger community awareness of the link between energy efficiency, energy efficient technologies and renewable energy sources.

4.1 Communication audiences

The project communications activities had a strong focus on 1) stakeholder communications and 2) Western Sydney resident communications.

An overview of the project’s key stakeholders is listed in figure 2.

“You’ve got to have support from the leadership for these sorts of initiatives. All the consultation and coordination made sure that this happened.”

- Project Stakeholder
Figure 2: Project Stakeholders

WSROC PROJECT TEAM

- Consultants
- WSROC General Managers
- Endeavour Energy
- Lighting suppliers
- Media
- Community stakeholder groups e.g. environmental organisations
- Community - at events and consuming media
- Project Reference Group
- Other government departments, Ministers & MPs (State & Federal)
- Participating council staff - sustainability, media and communications, mayoral offices
- Education providers - Western Sydney University and TAFE
- Department of Industry, Innovation and Science

THE WESTERN SYDNEY ENERGY EFFICIENT STREET LIGHTING PROJECT 15
THE WESTERN SYDNEY ENERGY EFFICIENT STREET LIGHTING PROJECT

Photo credit: Serge Golikov. WSROC President Cllr Tony Hadchiti next to a newly installed LED light.
## 4.2 Communication outputs

An overview of key project communication outputs is listed below:

<table>
<thead>
<tr>
<th>Communication platforms</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WSROC website</strong></td>
<td><a href="http://www.wsroc.com.au">www.wsroc.com.au</a> – various locations within site</td>
</tr>
<tr>
<td><strong>Project e-newsletter</strong></td>
<td>4 issues (edition 5 in progress), 89 subscribers</td>
</tr>
<tr>
<td><strong>WSROC e-newsletter</strong></td>
<td>15 editions (16th edition in development), 834 subscribers</td>
</tr>
<tr>
<td><strong>Social media</strong></td>
<td>On WSROC Facebook, Twitter, Instagram, Flickr, Google+ (2 pages), LinkedIn company page</td>
</tr>
<tr>
<td><strong>Council channels</strong></td>
<td>Disseminated information on participating council channels including web, e-news, social media, community newsletters, reception foyer TV screens and more.</td>
</tr>
<tr>
<td><strong>Imagery and photography</strong></td>
<td>Created project image library with existing and new photography and images. Photography included project events and activities and a series of night photography.</td>
</tr>
<tr>
<td><strong>Case study document</strong></td>
<td>Case study document celebrating the project</td>
</tr>
</tbody>
</table>

**Marketing and branding**

| **Branding**                     | Developed campaign branding and mascots. Distributed design elements to council media and communications teams. |
| **Marketing collateral**         | Brochures, flyers and posters developed including translated materials. Resident FAQ documents for nine councils and Endeavour Energy installation crews to use in case of questions from residents. Event materials including pull up banners, event signage, team vests for events, energy saver kit showbags, colouring-in competition templates. Ongoing social media and web branded images. |

**Internal communication resources**

<p>| <strong>Internal FAQ guide</strong>           | In-depth internal reference document answering frequently asked questions, summarising key messages and statistics, and providing an overview of WSROC support and contacts. |
| <strong>Presentation</strong>                 | Generic PowerPoint for council staff to use in council foyers on television screens. |
| <strong>Key message documents and communication</strong> | Developed and disseminated key media messages documents according to the phase of the project. |
| <strong>Complaint and enquiry handling</strong> | Created and disseminated complaint handling guides and protocols including draft response letters. Ongoing enquiry log to track conversations and responses. |
| <strong>Advocacy document</strong>            | Outlining key advocacy issues on public lighting for local government. |</p>
<table>
<thead>
<tr>
<th>PR and Media</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Media management and liaison</strong></td>
</tr>
<tr>
<td>Liaison with and monitoring of local, metro and niche media.</td>
</tr>
<tr>
<td><strong>Media releases and stories</strong></td>
</tr>
<tr>
<td>Development and pitching of media stories.</td>
</tr>
<tr>
<td><strong>Media kit resources</strong></td>
</tr>
<tr>
<td>Key statistics document. Dropbox repository with photos, facts and media releases.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Events and education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community events</strong></td>
</tr>
<tr>
<td>10 community events attended with project event stall.</td>
</tr>
<tr>
<td><strong>Media launches</strong></td>
</tr>
<tr>
<td>Nine media launches delivered; one for each participating council.</td>
</tr>
<tr>
<td><strong>Event resource kit</strong></td>
</tr>
<tr>
<td>Event kit developed including educational resources and marketing materials for residents.</td>
</tr>
<tr>
<td><strong>Colouring in competition</strong></td>
</tr>
<tr>
<td>Colouring in competition delivered, targeting school age children.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reporting and stakeholder communications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reporting with key stakeholders</strong></td>
</tr>
<tr>
<td>Ongoing reporting to and liaising with key stakeholders including the Australian Government and participating councils.</td>
</tr>
<tr>
<td><strong>Stakeholder communications</strong></td>
</tr>
<tr>
<td>Ongoing communication following general enquiries e.g. lighting suppliers, councils around Australia, other government departments (including NSW Office of Environment and Heritage).</td>
</tr>
</tbody>
</table>
Photo credit: Serge Golikov. Newly installed LED streetlights at Bligh Park, Hawkesbury City Council
5. Outcomes and benefits of the program

An overview of project achievements and how they relate to project outcomes and objectives is included below. A more detailed description of calculations is listed in sections 5.2 and 5.3.

5.1 Project outcomes overview

<table>
<thead>
<tr>
<th>OUTCOME 1 – exceeded ✓</th>
<th>Evidence and assessment of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predicted</strong></td>
<td>Replacement of 12,770 obsolete, end of economic life street lights with retrofitted energy efficient types which consume up to 60 per cent less electricity in nine Western Sydney Local Government Areas.</td>
</tr>
<tr>
<td><strong>Evidence and assessment of achievement</strong></td>
<td>Total of 13,951 lights replaced across nine Western Sydney Local Government Areas. Lights are 77 per cent more energy efficient.</td>
</tr>
<tr>
<td><strong>Objective/s addressed</strong></td>
<td><strong>LYA objective 1:</strong> Deliver energy efficiency improvements to Western Sydney councils’ public street lighting leading to a reduction in carbon emissions and increased cost savings.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTCOME 2 – exceeded ✓</th>
<th>Evidence and assessment of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predicted</strong></td>
<td>Reduce Western Sydney’s energy consumption by 66 per cent.</td>
</tr>
<tr>
<td><strong>Evidence and assessment of achievement</strong></td>
<td>The new street lights are 77 per cent more energy efficient.</td>
</tr>
<tr>
<td><strong>Objective/s addressed</strong></td>
<td><strong>LYA objective 1:</strong> Deliver energy efficiency improvements to Western Sydney councils’ public street lighting leading to a reduction in carbon emissions and increased cost savings.</td>
</tr>
</tbody>
</table>

**CEEP objective 1:** Support a range of local councils and community organisations to increase the energy efficiency of different types of non-residential council and community-use buildings, facilities and lighting; particularly where this would benefit low socio-economic and other disadvantaged communities or support energy efficiency in regional and rural councils.
## OUTCOME 3 – exceeded ✓

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Evidence and assessment of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing Western Sydney’s greenhouse gas emissions by almost 70,000 tonnes of CO2-e over the life of the asset (20 years).</td>
<td>The LYA project will lead to a reduction of around 4,000 tonnes of CO2-e per annum or 85,000 tonnes of CO2-e over the life of the asset (20 years). See section 5.2 for more detail</td>
</tr>
</tbody>
</table>

### Objective/s addressed

**LYA objective 1:** Deliver energy efficiency improvements to Western Sydney councils’ public street lighting leading to a reduction in carbon emissions and increased cost savings.

**CEEP objective 1:** Support a range of local councils and community organisations to increase the energy efficiency of different types of non-residential council and community-use buildings, facilities and lighting; particularly where this would benefit low socio-economic and other disadvantaged communities or support energy efficiency in regional and rural councils.

## OUTCOME 4 – under achieved

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Evidence and assessment of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce energy costs to the Western Sydney community by over $20 million over the life of the asset (20 years) at current electricity prices.</td>
<td>Cost savings of the LED lights will be an average of around $915,000 per annum or $18.30 million over the life of the asset (20 years). See section 5.2 for more detail</td>
</tr>
</tbody>
</table>

### Objective/s addressed

**LYA objective 1:** Deliver energy efficiency improvements to Western Sydney councils’ public street lighting leading to a reduction in carbon emissions and increased cost savings.

**LYA objective 5:** Advocate on behalf of our councils to ensure they have some control over their energy usage.

**CEEP objective 1:** Support a range of local councils and community organisations to increase the energy efficiency of different types of non-residential council and community-use buildings, facilities and lighting; particularly where this would benefit low socio-economic and other disadvantaged communities or support energy efficiency in regional and rural councils.
## OUTCOME 5 – achieved √

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Evidence and assessment of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved community knowledge of energy efficiency and climate change.</td>
<td>One in five people (21 per cent) in Western Sydney were aware of the LYA program by its completion – with similar levels of awareness among people from low, middle and high household income groups.</td>
</tr>
<tr>
<td></td>
<td>Based on the survey research, 10 per cent of all people in Western Sydney had considered making some changes in their household as a result of learning about Light Years Ahead and one per cent had actually made some change.</td>
</tr>
<tr>
<td></td>
<td>Based on a small survey of those who attended the LYA booth at community events two thirds of visitors reported having made some change in their household, most commonly the use of LED lights.</td>
</tr>
<tr>
<td></td>
<td>See section 5.3 for more detail</td>
</tr>
</tbody>
</table>

### Objective/s addressed

- **LYA objective 2:** Develop and implement educational and engagement tools and materials to ensure that key stakeholders and the Western Sydney community benefit and learn from the project activities during the project and beyond.
- **LYA objective 3:** Showcase the Western Sydney region as a frontrunner on energy efficiency.
- **LYA objective 4:** Set an example for our residents by changing to low emission light bulbs.
- **CEEP objective 2:** Demonstrate and encourage the adoption of improved energy management practices within councils, organisations and the broader community.

## OUTCOME 6 – achieved √

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Evidence and assessment of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of community support for sustainable street lighting and other energy efficiency practices.</td>
<td>The results of the community survey show strong and widespread community support for the LYA program.</td>
</tr>
<tr>
<td></td>
<td>A large majority (over 80% per cent) of people agreed that, among other things, they personally supported the program, thought it was important for Western Sydney and that governments should be doing more of these sorts of things.</td>
</tr>
<tr>
<td></td>
<td><em>See section 5.3 for more detail</em></td>
</tr>
</tbody>
</table>

### Objective/s addressed

- **LYA objective 2:** Develop and implement educational and engagement tools and materials to ensure that key stakeholders and the Western Sydney community benefit and learn from the project activities during the project and beyond.
- **LYA objective 3:** Showcase the Western Sydney region as a frontrunner on energy efficiency.
- **LYA objective 4:** Set an example to our residents by changing to low emission light bulbs.
- **CEEP objective 2:** Demonstrate and encourage the adoption of improved energy management practices within councils, organisations and the broader community.
**OUTCOME 7 – achieved ✓**

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Evidence and assessment of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved energy management practices by Western Sydney local councils, business and communities.</td>
<td>The results of the stakeholder interviews show that the project has helped to develop support for sustainability initiatives within councils. The clear financial business case, along with the clear environmental benefits ensured a high degree of buy-in from all areas within a council. Most of the councils interviewed had already noticed significant savings and were widely publicising this outcome. It was thought that future sustainability initiatives might be given more consideration in future, given the success of the LYA program. <em>See section 5.2 for more detail</em></td>
</tr>
</tbody>
</table>

**Objective/s addressed**

**LYA objective 2:** Develop and implement educational and engagement tools and materials to ensure that key stakeholders and the Western Sydney community benefit and learn from the project activities during the project and beyond.

**LYA objective 3:** Showcase the Western Sydney region as a frontrunner on energy efficiency.

**LYA objective 5:** Advocate on behalf of our councils to ensure they have some control over their energy usage.

**CEEP objective 2:** Demonstrate and encourage the adoption of improved energy management practices within councils, organisations and the broader community.
Photo credit: WSROC - Recycling of the plastic visors.
5.2 Energy efficiency outcomes

The observed technical project outcomes were slightly different than expected, as indicated in the table below:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Expected</th>
<th>Achieved (to date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lights changed to LED</td>
<td>12,770</td>
<td>13,951</td>
</tr>
<tr>
<td>Energy reduction per year (kWh)</td>
<td>3,227,204</td>
<td>4,451,715</td>
</tr>
<tr>
<td>Energy reduction over life of asset (kWh)</td>
<td>64,544,080</td>
<td>89,034,307</td>
</tr>
<tr>
<td>GHG emissions saved per year (tonnes)</td>
<td>3,295</td>
<td>4,274</td>
</tr>
<tr>
<td>GHG emissions saved over life of assets (tonnes)</td>
<td>65,909</td>
<td>85,473</td>
</tr>
<tr>
<td>Financial savings over life of assets</td>
<td>$20.74 million$</td>
<td>$18.30 million$</td>
</tr>
</tbody>
</table>

The breakdown of financial savings based on current assumptions are as below:

<table>
<thead>
<tr>
<th>Savings</th>
<th>To Date (April 2016)</th>
<th>Final (May 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Savings</td>
<td>$21.26 million</td>
<td>$22.58 million</td>
</tr>
<tr>
<td>SLUOS Savings</td>
<td>-$2.95 million</td>
<td>-$3.2 million</td>
</tr>
<tr>
<td>Total Savings</td>
<td>$18.30 million</td>
<td>$19.38 million</td>
</tr>
</tbody>
</table>

The differences between the expected and final figures arose for several reasons:

- **Increased energy and GHG reductions**
  
  Firstly, when the project was being planned, there were no LED luminaires approved for the Endeavour Energy networks. The initial modelled scenario was based on replacing the existing 80W MV lights with 25W LED lights. In mid-2014, 18W LED lights were approved as replacements for 80W MV lights. The project plan was therefore amended to allow all lights to be changed to 18W LEDs. The relative benefits offered by fluorescent (CFL), T5 and LED technologies were also assessed and it was determined that while LED luminaires incurred a higher initial capital cost, there were sufficient whole-of-life operational benefits to justify using LED luminaires for the bulk conversion project. For example, the LED has 20 per cent energy efficiency over the current fluorescent lighting options (T5 or CFL).

- **Reduction in expected financial savings**
  
  Assumptions used to calculate the expected financial savings have changed since the original project plan was created. This is mainly due to the fact that electricity prices have not been growing at the rates anticipated in 2013 and SLUOS charges have risen quite significantly - the model has been updated to reflect this.

- **Increase in number of lights being changed over**
  
  Due to the reduction in capital costs for LEDs, the project was able to change 1,181 additional lights. This has resulted in further energy emission reduction.

Please see Appendix B for an overview of calculations used for energy efficiency outcomes.

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5 The expected outcome figures reflect those provided in the original project plan – replacing to 25W LED lamps. This plan was subsequently amended to use 18W LED technology, with approval from the Australian Government.
5.2.1 Ongoing works

On top of the reported outcomes above, councils have invested more funding to continue the works (outside of the scope of the CEEP program). An additional 1,000 lights are currently being installed and will be completed by the end of May 2016. The anticipated outcomes including the May installations are listed below. Note, these are unaudited outcomes.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Expected</th>
<th>Anticipated Outcomes (May 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lights changed to LED</td>
<td>12,770</td>
<td>14,951</td>
</tr>
<tr>
<td>Energy reduction per year (kWh)</td>
<td>3,227,204</td>
<td>4,771,622</td>
</tr>
<tr>
<td>Energy reduction over life of asset (kWh)</td>
<td>64,544,080</td>
<td>95,416,237</td>
</tr>
<tr>
<td>GHG emissions saved per year (tonnes)</td>
<td>3,295</td>
<td>4,289</td>
</tr>
<tr>
<td>GHG emissions saved over life of assets (tonnes)</td>
<td>65,909</td>
<td>85,773</td>
</tr>
<tr>
<td>Financial savings over life of assets</td>
<td>$20.74 million</td>
<td>$19.37 million</td>
</tr>
</tbody>
</table>

Breakdown of financial savings:

<table>
<thead>
<tr>
<th>Savings</th>
<th>Anticipated outcomes (May 2016) Amount ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Savings</td>
<td>$22.58 million</td>
</tr>
<tr>
<td>SLUOS Savings</td>
<td>-$3.2 million</td>
</tr>
<tr>
<td>Total Savings</td>
<td>$19.38 million</td>
</tr>
</tbody>
</table>

6 These are anticipated outcomes, but at this stage unaudited.
5.2.2 Ancillary benefits - safety

As well as requiring less maintenance – and the obvious energy efficiency benefits – there are a number of other positive outcomes associated with LED lighting particularly relating to safety, social and environmental benefits.

With regards to safety, lighting is considered to be ‘safe’ when it maintains a consistent level of light throughout a space. Safe lighting provides light that is spread evenly onto roads and public spaces, and avoids patches of dark and light, which are common with old lighting technologies such as MV.

Safe lighting also allows objects (both moving and stationary) to be more easily identified by the human eye. This property of lighting is measured via the Colour Rendering Index (CRI) and relates to the colour of the light emitted. Broadly speaking, a whiter or ‘cooler’ light improves facial recognition and helps motorists and pedestrians react quicker, thereby reducing the chances of accidents. In contrast, a more yellow or “warmer” light reduces the ability to accurately perceive objects.

This is also an important consideration where CCTV is deployed as a safety measure, again, to assist with facial recognition. This aspect of lighting is also linked to what is known as colour temperature (measured in degrees kelvin).

Whiter or “cooler” lights are in the range 4,000-6,000°K (above 5,000°K start to appear bluish), whereas more yellow or “warmer” lights are generally below 3,000°K.

There is also balance to be struck between energy efficiency (i.e. higher temperatures in the blue range (above 5,000°K are more efficient) and the ability of drivers to see pedestrians (too blue or too yellow (below 3,000°K) results in lighting where it is hard to see colour and contrast). International trends are towards a mid-range colour temperature of 4,000°K (neutral white).

In Figure 3 we can again see “before” (HPS) and “after” (LED) images of an LED retrofit in Los Angeles. Results from the LED changeover in Los Angeles demonstrated a measurable reduction in street crime and vandalism after LED street lighting was introduced.

LEDs also minimise glare, thereby increasing visual comfort for people with certain kinds of vision impairment. Reduced glare also assists NSW Police and other law enforcement agencies, because less glare is clearer for cameras that require clear contrast.

Figure 3: Hoover Street, Los Angeles, before and after LED deployment on main road
The light output of the old MV lights was maintained by a process of periodic visor cleaning and lamp replacements throughout their service life. While the design of street lights will factor-in dirt build up on visors and reduction in light output of the primary light source over time, the light output from the old MV would drop off very quickly, resulting in a big difference in light output at the start of its service life compared to the end of its service life.

This resulted in significant differences in light output between lights at the beginning and end of their service life, and from light to light in a given street. The Light Years Ahead project’s new LED lights maintain a more consistent light output over time, which minimises fluctuation in illumination from light to light, and street to street.

Along with the technical parameters outlined above, public perceptions of safety are also an important consideration, and are often directly linked to the lighting of public spaces. Even though improved lighting should not be viewed in isolation as the answer to all crime and accident-related issues, improved illumination can play a role in addressing public perceptions of a lack of security or safety.

LEDs can also reduce other environmental impacts. The old MV lights were manufactured using harmful substances like lead and mercury. These substances risk being introduced into the environment during a light’s service life, and must be carefully disposed of when a light is retired.

Note that the Light Years Ahead street lighting project included stringent waste and recycling practices that were carried out by the installer. These processes were closely monitored by WSROC and technical consultant Ironbark Sustainability.

5.2.3 Opportunities for local industry

Throughout the course of the project several opportunities have arisen for local organisations, industry and business. The project engaged the following local contractors and/or suppliers:

- NSW Energy Distributer, Endeavour Energy (Western Sydney based)
- Waste disposal, Plastic Industrial Company Pty (Western Sydney based)
- Technical consultant, Ironbark Sustainability (Melbourne based)
- Evaluation consultant, Inca Consulting (Sydney based)
- Graphic Design Agencies, Metro Graphics (Sydney based), Kathie Nad (Western Sydney based)
- Print company, Clickprint (Western Sydney based)
- Photographers; Mr Jay La and Mr Serge Golikov (Western Sydney based)
- Consultants to develop event education resources, Wintelboff (Western Sydney based)
- Catering, Vibes Catering (Western Sydney based)
5.3 Evaluation communications activities

As the largest LED street lighting project in Western Sydney’s history, the project attracted a high level of media attention, with the project demonstrating to the community the importance of energy efficiency and reducing greenhouse emissions.

WSROC engaged independent evaluation consultant INCA Consulting to evaluate the project’s achievements.

The following research and data collection activities were undertaken during the project:

- Ongoing consultation with WSROC and partner council officers (including those working in asset management, engineering, sustainability programs, marketing and communications).
- Formal in-depth interviews with council officers, Endeavour Energy and other consultants engaged by WSROC – a total of 19 interviews.
- An online survey of 15 visitors to the LYA booth at community events, using 67 email addresses harvested during the visit. (People were offered a household energy savings kit if they participated, but the response of only 15 was disappointing).
- Collection of the observations of those staffing the community event booth.
- An online survey of a randomised sample of 217 householders in the participating LGAs, using a commercially available panel of willing research participants. The survey provided a good cross section of the Western Sydney community.
- Interviews with the teachers from seven schools that attended the Light Years Ahead seminar at the Youth Eco Summit.

5.3.1 Reach of communication platforms

As outlined in section 4.2, WSROC produced content on a number of platforms. A summary of the campaign reach is listed below. Figures correct at 28 April 2016 and are from 8 September 2014 (the date the project media and communications officer started at WSROC) unless otherwise stated.

Project website

A dedicated website www.lightyearsahead.com.au was developed which has been visited by 4,716 users to date, with a total of 6,263 visits. On average, users spent 1:36 minutes on the site. The website achieved 10,708 page views, with 1.71 page views per session. The bounce rate for the website was 75.30 per cent. The most visited pages after the Home Page were the Lighting Roll Out, the Events and the About pages.

WSROC website

The WSROC website was used to promote the project. A dedicated project website was set up which has received 4,001 hits to date. The project further published 26 Light Years Ahead media and news stories on the WSROC website. Below is an overview of the media releases and news stories published on the WSROC website:
### Social media

The project used the existing WSROC social media platforms and shared content with pages of participating councils who have greater audiences. An overview of social media platforms and impressions is listed below.

- **Facebook:** 613 likes
- **Twitter:** 486 followers
- **Instagram:** 38 followers
- **Google plus:** 103,641 views
- **LinkedIn:** 181 followers, 7,434 impressions in the last 6 months

### E-newsletters

A dedicated project e-newsletter was developed and attracted 89 subscribers, mainly project stakeholders. Over the duration of the project, five editions were circulated. The project was also frequently promoted in the WSROC corporate e-newsletter that had 16 editions over the course of the project, with 834 subscribers.

## Name of story

<table>
<thead>
<tr>
<th>Name of story</th>
<th>Hits to date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Sydney councils celebrate end of street lighting project</td>
<td>55</td>
</tr>
<tr>
<td>LED street lighting halfway mark</td>
<td>243</td>
</tr>
<tr>
<td>Holroyd City Council sees the (LED) light</td>
<td>222</td>
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<tr>
<td>Liverpool Council flicks switch on energy efficiency</td>
<td>581</td>
</tr>
<tr>
<td>Hawkesbury City Council switches on the (LED) lights</td>
<td>218</td>
</tr>
<tr>
<td>Fairfield City Council forging “Light Years Ahead”</td>
<td>598</td>
</tr>
<tr>
<td>LED lighting saves millions</td>
<td>574</td>
</tr>
<tr>
<td>Parramatta City Council switches on the (LED) lights</td>
<td>909</td>
</tr>
<tr>
<td>Western Sydney councils see the (LED) light</td>
<td>1705</td>
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</table>

## News stories

<table>
<thead>
<tr>
<th>Name of story</th>
<th>Hits to date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Sydney councils celebrate end of street lighting project</td>
<td>31</td>
</tr>
<tr>
<td>Hawkesbury Show lights up</td>
<td>72</td>
</tr>
<tr>
<td>Light Years Ahead Jan roll-out update</td>
<td>50</td>
</tr>
<tr>
<td>Light Years Ahead on Australia Day</td>
<td>186</td>
</tr>
<tr>
<td>Light Years Ahead - The final count down</td>
<td>252</td>
</tr>
<tr>
<td>Australia Day around Western Sydney</td>
<td>373</td>
</tr>
<tr>
<td>Summer tips to reduce energy</td>
<td>151</td>
</tr>
<tr>
<td>Light Years Ahead helps Lights for Kids</td>
<td>193</td>
</tr>
<tr>
<td>Light Years Ahead reaches half-way point</td>
<td>345</td>
</tr>
<tr>
<td>Light Years Ahead colouring comp closing soon</td>
<td>527</td>
</tr>
<tr>
<td>Spring has sprung, events season has begun</td>
<td>326</td>
</tr>
<tr>
<td>Light Years Ahead update</td>
<td>328</td>
</tr>
<tr>
<td>Western Sydney suburbs named for new LED street lights</td>
<td>1152</td>
</tr>
<tr>
<td>Lighting up Western Sydney</td>
<td>543</td>
</tr>
<tr>
<td>Councils can be leaders says Tim Flannery</td>
<td>511</td>
</tr>
<tr>
<td>Council staff design lighting roll out</td>
<td>921</td>
</tr>
<tr>
<td>Western Sydney moving Light Years Ahead</td>
<td>1163</td>
</tr>
</tbody>
</table>
5.3.2 Impact of communications activities

Key findings from the evaluation report are included below:

- Communications ‘products’ were widely adopted by partner councils.
- There was significant media interest in the program with 82 print articles written and included in over 20 publications.
- There was strong visitation to the LYA website (4,716 visits), strong visitation to other websites carrying LYA content and extensive social media activity (for example, 613 Facebook ‘likes’ and 486 Twitter followers).
- There was engagement with around 3,000 people via the Light Years Ahead booth at nine community events across Western Sydney, including people from low, middle and high household income groups.
- There was engagement with 273 students from nine schools via the workshops delivered at the Youth Eco Summit that resulted in further attention given to energy efficiency back in the classroom.
- One in five people (21 per cent) in Western Sydney were aware of the LYA program by the program’s completion – with similar levels of awareness among people from low, middle and high household income groups.
- Based on the survey research, 10 per cent of all people in Western Sydney had considered making some changes in their household as a result of learning about Light Years Ahead and one per cent had actually made some change.
- Based on a small survey of those who attended the LYA booth at community events two thirds of visitors reported having made some change in their household, most commonly the use of LED lights.
- A large majority of people in Western Sydney supported the project – 81 per cent personally supported it and thought that ‘governments should be doing more of this sort of thing’.

Please refer to Attachment C for the full evaluation report.
Photo credit: Jay La. The Light years Ahead project manager Michelle Playford at the Hawkesbury Show.
6. Budget

The Light Years Ahead project was delivered on time and within budget. Due to successful negotiations with the energy provider, capital replacement costs were lower than originally budgeted for, which allowed the project to change over an additional 1,000 lights.

There were some variations to line items as a result from cost savings in some line items (communications and administration) and maximising the project outcomes by redirecting those funds to another budget post (supply and installation of additional lights).

### INCOME

<table>
<thead>
<tr>
<th></th>
<th>Budget (excl GST)</th>
<th>Actual (excl GST)</th>
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</thead>
<tbody>
<tr>
<td>CEEP grant</td>
<td>$ 5,261,070</td>
<td>$ 5,261,070</td>
</tr>
<tr>
<td>Other contribution</td>
<td>$ 2,630,722</td>
<td>$ 2,630,722</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$ 7,891,792</strong></td>
<td><strong>$ 7,891,792</strong></td>
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### EXPENDITURE

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<th>Item</th>
<th>Budget (excl GST)</th>
<th>Actual (excl GST)</th>
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<tbody>
<tr>
<td>Capital replacement costs</td>
<td>$ 6,895,800</td>
<td>$ 7,187,666</td>
<td>To maximise the number of lights changed over, the savings from other line items was used to change over additional lights. As per approval by the Department.</td>
</tr>
<tr>
<td>Consultants</td>
<td>$ 412,021</td>
<td>$ 380,734</td>
<td>Under budget</td>
</tr>
<tr>
<td>Initial energy audit</td>
<td>$ 48,000</td>
<td>$ 51,230</td>
<td>Over budget</td>
</tr>
<tr>
<td>Administration</td>
<td>$ 100,000</td>
<td>$ 47,038</td>
<td>Under budget</td>
</tr>
<tr>
<td>Communications</td>
<td>$ 352,971</td>
<td>$ 225,123</td>
<td>Under budget</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$ 7,891,792</strong></td>
<td><strong>$ 7,891,792</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Balance</strong></td>
<td><strong>$ 0</strong></td>
<td><strong>$ 0</strong></td>
<td>Project came in on budget</td>
</tr>
</tbody>
</table>
7. Project operation, mechanisms and processes

This project was managed by WSROC on behalf of nine local councils in Western Sydney.

7.1 Project structure

The core WSROC project team consisted of a project director (WSROC CEO), project coordinator (WSROC staff), project manager (contract position) and a media and communication officer (contract position). The team was supported where needed by other WSROC staff, such as the procurement manager, executive assistant and others. The project team reported regularly to the Department and councils.

The project team engaged consultancy Ironbark Sustainability who assisted with technical project management. WSROC and Ironbark held weekly progress meetings to discuss any project issues and handle ad hoc issues. A good and efficient working relationship with Endeavour Energy was also developed during the course of the project.

Monthly meetings were held to track the progress and update the risks and issues registers. The project team was further supported by a reference group, made up of council staff in the fields of asset management, engineering and sustainability. This made for a great source of knowledge and expertise.

**WSROC was responsible for all project reporting, including:**

- Milestone reporting to the Federal Government
- Bi-monthly reporting to WSROC General Managers
- Bi-monthly reporting to WSROC Board.
- Regular reporting to project Reference Group

Photo credit: Jay La. The Project Reference Group.
Figure 4: Project implementation structure

- WSROC Board
- WSROC GMs
- Funding Body DOI&S

Project Team:
- Project Director
- Project Coordinator
- Project Manager
- Project Communication and Media Officer

Project Advisory / Implementation:
- Project Technical Consultants (for project management, supply and installation, evaluation)
- Project Reference Group
- Project Working Groups (Communications, ESO, WSEEN, etc)
8. Key challenges and learnings

Public street lighting is a major cost to local government. It accounts for approximately 55 per cent of WSROC councils’ energy costs and around 5 per cent of total budget expenditure.

The WSROC councils have been investigating options for a street lighting “bulk change” for nearly a decade. However, the high up front cost and associated long payback times were substantial barriers. This project could not have happened without CEEP funding.

Nevertheless, there were components which were complex mainly due to the project involving a large number of diverse stakeholders; the fact that councils do not own the assets they were seeking to change; multiple funding streams; and the relative size of the project.

Key challenges along the way were:

- Street lighting is a complex issue; utilities own the street lights (the assets) but councils have responsibility for the service. The main issues councils face with the current street lighting model is the lack of clear governance and pricing transparency. During the course of the project, Endeavour Energy increased its maintenance (SLUOS) charges for LEDs, which drastically impacted the projected project savings. It is WSROC’s view that these SLUOS charges are disproportionately high, and WSROC will continue to advocate for lower SLUOS charges and greater transparency in pricing and governance in public lighting.

- Regional Organisations of Councils (ROCs), such as WSROC, are ideally placed to implement projects such as Light Years Ahead, ensuring regional implementation and maximisation of outcomes. However, consideration should be given by the funding body for such organisations, which may need to source external resources to deliver the program. For Light Years Ahead this proved challenging early on when a project plan was to be developed before the organisation was allowed to engage a project manager. WSROC urges the Australian Government to ensure that future funding programs take into consideration the type of organisation it funds and allow for flexibility if needed.

- Due to the change of government in 2013, the execution of the contract for the project was delayed by nearly six months. However, the end date for the project remained the same, which resulted in the project timeframe being condensed considerably.

The program achieved some substantial value added (and sometimes unexpected) outcomes, which were reported through the project evaluation:

- Key learning through this project is that greater financial and resource efficiencies are achieved through regional projects, and grouping councils together. It was also clear that the collective of councils ensured a stronger negotiation position with the energy provider.

- The project has helped to develop support for sustainability initiatives within councils. The clear financial business case, along with the clear environmental benefits ensured a high degree of buy-in from all areas within a council. It was thought that future sustainability initiatives might be given more consideration, given the success of the LYA program.

“Very progressive thinking towards sustainability and budget saving.”
- Resident response to community survey
• The project has allowed staff within councils to work more closely with their colleagues in other sections, and to work collaboratively with their peers in other councils. It was reported that stronger working relationships and more information sharing has resulted from the project.

• It was reported that councils have developed a greater understanding of the commercial dynamics involved with purchasing energy and paying maintenance costs. Councils reportedly developed more confidence in their ability to negotiate with the distributor and to work in partnership in order to achieve a particular financial outcome.

• It was noted that many local councils, including those outside of the participating project councils, were looking to WSROC and the Light Years Ahead project as a model of good practice and were eager to emulate it in their own LGA or region.

• Stakeholder requests throughout the project showed that the program communications alerted a variety of external entities to the existence of the program. It also shows that various actors across the sector have looked to Light Years Ahead as an example of good practice in driving energy efficiency in local communities.

The Australian Government’s Community Energy Efficiency Program has truly kick-started a series of energy efficiency programs in Western Sydney. A particularly good outcome from the project is that WSROC is currently working with its councils to expand the street light bulk replacement program (Light Years Ahead stage 2), which is looking to replace more than 20,000 lights across the region.

Another flow on effect from the project is that it has put energy efficiency firmly on the agenda for councils again. As a result, WSROC is currently working on setting up a major extended energy efficiency program for its councils (in addition to the abovementioned Light Years Ahead stage 2 program, which includes building upgrades, solar power, fleet management and more.)

Photo credit: Jay La. Project launch at Liverpool City Council Project Manager Michelle Playford, Communications Officer Nicole Miller, Liverpool Mayor Cllr Ned Mannoun, Craig Kelly, MP (Hughes), WSROC Procurement Manager Nic Pasternatsky, Executive Assistant Shina Khan, Project Coordinator Judith Bruisma [left to right].
9. Conclusion

LED streetlights have begun transforming cities and councils across the globe and this will continue over the next decade. LED streetlights lead the way when combining factors such as lamp life, lamp life efficacy and the potential for smart lighting controls and remote monitoring systems.

It is a mature technology ready for mass deployment as demonstrated by the growing number of jurisdictions around the world that have upgraded to LEDs – a list that now includes the Western Sydney councils.

The Light Years Ahead project has resulted in the successful replacement of 13,951 mercury vapour street lights with modern and energy efficient LEDs.

This has been an extremely successful project and WSROC is thrilled with the outcome. More importantly, participant councils are already starting to see the massive cost and energy savings that flow through with lights that require 77 per cent less electricity and cost less to maintain.

The flow-on benefits from the community promotion and education component of the project has been far and wide and proved crucial to the wider program. It can be viewed as the ‘glue’ that held the partnership together providing the basis for ongoing collaboration between Western Sydney councils around sustainability issues.

The communications effort has helped to raise awareness of energy efficiency within the Western Sydney community and to stimulate active consideration of implementing energy efficient products and practices within households.

The communications strategy has also attracted the interest of community members and representatives in other geographic areas.

The Light Years Ahead project has also built on and improved partnerships and relationships within and between Western Sydney councils. The benefits of this project will flow into the future for the entire community.

WSROC would like to thank the Australian Government for providing the funding for this program. It has not only assisted Western Sydney councils in delivering the largest street light replacement program in the region, it has also kick-started further conversations about energy efficiency.

WSROC and its member councils are currently in the process of setting up a program to 1) continue the roll out of more LED street lights in the region; and 2) establish a Western Sydney energy efficiency program which looks at building upgrades and renewable energy for council assets.
Photo credit: Jay La. The LYA project gave away energy saver packs at the Westmead Children’s Hospital Christmas Appeal. WSROC president Cllr Tony Hadchiti with Westmead mascot Bandage Bear.
## Attachment A: Project Energy Efficiency Improvement

<table>
<thead>
<tr>
<th>PROJECT TITLE</th>
<th>Light Years Ahead</th>
<th>PROJECT ID</th>
<th>CEEP2109</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNDING RECIPIENT</td>
<td>Western Sydney Regional Organisation of Councils Limited</td>
<td>DATE</td>
<td>15 April 2016</td>
</tr>
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</table>

### Building, Facility or Site 1

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site 1</th>
<th>Blacktown City Council</th>
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</thead>
<tbody>
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<td>Location (address)</td>
<td>The project included streets in the suburbs of Blacktown, Riverstone, Shalvey, Arndell Park, Schofields, Willmot, Minchinbury, Ropes Crossing, Eastern Creek, The Ponds, Bungarribee, Vineyard, Quakers Hill, Lethbridge Park, Emerton, Tregear, Whalan, Doonside, Lalor Park, Prospect, Huntingwood, Rouse Hill, Marsden Park, Mount Druitt, Kings Langley, Seven Hills and Stanhope Gardens</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of building, facility or site</th>
<th>Public Street Lighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of Street Lighting</td>
</tr>
</tbody>
</table>

### Energy Efficiency Estimate Method

Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights.

The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated.

There are:

- 2,442 x 80W Mercury Vapour Lights (wattage 95.8w)

To calculate baseline energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

Baseline Energy Usage: 1,010,157 kWh per annum

Baseline Energy Efficiency:
- 2x14 W T5 = 320,636 kWh per annum
- 42W Compact Fluorescent = 458,374 kWh per annum
- LED 25W = 279,992 kWh per annum

The above baseline energy efficiencies were the figures submitted for
the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by Endeavour Energy, therefore, these scenarios were submitted pending confirmation from WSROC’s technical advisor.

Energy Efficiency Improvement

Energy savings from street lighting are very easy to predict because the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above).

The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality 2,442 x 18W “LEDs” (wattage 21.9w)

To calculate new energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

The new energy use is 230,923 kWh per year.

This project will save 779,234 kWh per year (2,805,241 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

Reporting Data (Measuring Energy Efficiency and Additional Data)

Percentage of the day lights are operational: 49.3%

Assumptions

- Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.
- SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016
- All savings and cost figures are GST Exclusive;
- Operating hours of lights are 11.83 hours per day in NSW

Cost of Activity $1,177,127
Estimated Cost Savings $3.22 million over 20 years or an average of $161,013 per year.
<table>
<thead>
<tr>
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<td>Name of Building, Facility or Site 2</td>
<td>The project included streets in the suburbs of Katoomba, Leura, Linden, Faulconbridge, Springwood, Valley heights, Winmalee and Yellow Rock</td>
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<tr>
<td>Location (address)</td>
<td></td>
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<tr>
<td>Type of building, facility or site</td>
<td>Public Street Lighting</td>
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<td>Activity Type and Measure</td>
<td>Upgrade of Street Lighting</td>
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</tbody>
</table>
| Energy Efficiency Estimate Method | Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights. The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated. There are:
662 x 80W Mercury Vapour Lights (wattage 95.8w)
To calculate baseline energy use the calculation is:
Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).
Baseline Energy Usage | 273,843 kWh per annum |
| Baseline Energy Efficiency | |
| | • 2x14 W T5 = 93,720 kWh per annum
• 42W Compact Fluorescent = 133,980 kWh per annum
• LED 25W = 81,840 kWh per annum
The above baseline energy efficiencies were the figures submitted for the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by Endeavour Energy, therefore, these scenarios were submitted pending confirmation from WSROC’s technical advisor. |
| Energy Efficiency Improvement | Energy savings from street lighting are very easy to predict because the exact number and type of lights and their operating conditions are |
well known, and do not change as it is regulated by AEMO (see above).
The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality.

662 x 18W “LEDs” (wattage 21.9w)

To calculate new energy use the calculation is:
Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).
The new energy use is 62,601 kWh per year.
This project will save 211,242 kWh per year (760,471 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

<table>
<thead>
<tr>
<th>Reporting Data (Measuring Energy Efficiency and Additional Data)</th>
<th>Percentage of the day lights are operational: 49.3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumptions</td>
<td>• Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.</td>
</tr>
<tr>
<td></td>
<td>• SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016</td>
</tr>
<tr>
<td></td>
<td>• All savings and cost figures are GST Exclusive;</td>
</tr>
<tr>
<td></td>
<td>• Operating hours of lights are 11.83 hours per day in NSW</td>
</tr>
</tbody>
</table>

<p>| Cost of Activity | $319,150 |
| Estimated Cost Savings | $0.87 million over 20 years or an average of $43,653 per year. |</p>
<table>
<thead>
<tr>
<th><strong>PROJECT TITLE</strong></th>
<th>Light Years Ahead</th>
<th><strong>PROJECT ID</strong></th>
<th>CEEP2109</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FUNDING RECIPIENT</strong></td>
<td>Western Sydney Regional Organisation of Councils Limited</td>
<td><strong>DATE</strong></td>
<td>15 April 2016</td>
</tr>
</tbody>
</table>

**Building, Facility or Site 3**

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site 3</th>
<th>Fairfield City Council</th>
</tr>
</thead>
</table>

| Location (address) | The project included streets in the suburbs of Bonnyrigg Heights, Edensor Park, Bonnyrigg, Greenfield Park, Bossley Park, Wetherill Park, Smithfield, Prairiewood, St Johns Park, Wakeley, Canley Heights Canley Vale and Bonnyrigg Heights |

<table>
<thead>
<tr>
<th>Type of building, facility or site</th>
<th>Public Street Lighting</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Activity Type and Measure</th>
<th>Upgrade of Street Lighting</th>
</tr>
</thead>
</table>

**Energy Efficiency Estimate Method**

Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights.

The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated. There are:

1,214 x 80W Mercury Vapour Lights (wattage 95.8w)

To calculate baseline energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

**Baseline Energy Usage**

| 502,183 kWh per annum |

**Baseline Energy Efficiency**

- 2x14 W T5 = 620,950 kWh per annum
- 42W Compact Fluorescent = 483,212 kWh per annum
- LED 25W = 661,594 kWh per annum

The above baseline energy efficiencies were the figures submitted for the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by Endeavour Energy, therefore, these scenarios were submitted pending confirmation from WSROC’s technical advisor.

**Energy Efficiency Improvement**

Energy savings from street lighting are very easy to predict because
the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above). The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality

| 1,214 x 18W “LEDs” (wattage 21.9w) |

To calculate new energy use the calculation is:

| Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh). |

The new energy use is 114,800 kWh per year. This project will save 387,383 kWh per year (1,394,579 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

### Reporting Data (Measuring Energy Efficiency and Additional Data)

- **Percentage of the day lights are operational:** 49.3%
- **Assumptions**
  - Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.
  - SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016
  - All savings and cost figures are GST Exclusive;
  - Operating hours of lights are 11.83 hours per day in NSW

### Cost of Activity

| $588,820 |

### Estimated Cost Savings

<p>| $1.60 million over 20 years or an average of $79,926 per year. |</p>
<table>
<thead>
<tr>
<th>Building, Facility or Site 4</th>
<th>Hawkesbury City Council</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Building, Facility or Site 4</td>
<td>Hawksbury City Council</td>
</tr>
<tr>
<td>Location (address)</td>
<td>The project included streets in the suburbs of Wilberforce, Pitt Town, Windsor, South Windsor, Clarendon, Bligh Park, Oakville, Vineyard, Cornwallis, Windsor Downs and Freemans Reach</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Public Street Lighting</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of Street Lighting</td>
</tr>
</tbody>
</table>

**Energy Efficiency Estimate Method**

Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights.

The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated. There are:

- 562 x 80W Mercury Vapour Lights (wattage 95.8w)
- To calculate baseline energy use the calculation is: Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

**Baseline Energy Usage** 232,477 kWh per annum

**Baseline Energy Efficiency**

- 2x14 W T5 = 2,982 kWh per annum
- 42W Compact Fluorescent = 4,263 kWh per annum
- LED 25W = 2,604 kWh per annum

The above baseline energy efficiencies were the figures submitted for the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by Endeavour Energy, therefore, these scenarios were submitted pending confirmation from WSROC’s technical advisor.

**Energy Efficiency Improvement**

Energy savings from street lighting are very easy to predict because
the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above).

The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality

562 x 18W “LEDs” (wattage 21.9w)

To calculate new energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

The new energy use is 53,144 kWh per year.

This project will save 179,332 kWh per year (645,596 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

<table>
<thead>
<tr>
<th>Reporting Data (Measuring Energy Efficiency and Additional Data)</th>
<th>Percentage of the day lights are operational: 49.3%</th>
</tr>
</thead>
</table>
| Assumptions | • Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.  
• SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016  
• All savings and cost figures are GST Exclusive;  
• Operating hours of lights are 11.83 hours per day in NSW |

<p>| Cost of Activity | $272,621 |
| Estimated Cost Savings | $0.74 million over 20 years or an average of $36,946 per year. |</p>
<table>
<thead>
<tr>
<th>Building, Facility or Site 5</th>
<th>Holroyd City Council</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Building, Facility or Site 5</td>
<td>Holroyd City Council</td>
</tr>
<tr>
<td>Location (address)</td>
<td>The project included streets in the suburbs of Merrylands, Merrylands West, South Wentworthville, Wentworthville, Smithfield, Woodpark, Guildford West, Greystanes, Mays Hill and Pendle Hill</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Public Street Lighting</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of Street Lighting</td>
</tr>
</tbody>
</table>

**Energy Efficiency Estimate Method**

Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straightforward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights.

The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated. There are:

- 940 x 80W Mercury Vapour Lights (wattage 95.8w)

To calculate baseline energy use the calculation is:

\[
\text{Number of Lights} \times \text{Wattage} \times 365 \times 11.83 \div 1000
\]

Baseline Energy Usage: 388,840 kWh per annum

Baseline Energy Efficiency:

- 2x14 W T5 = 109,766 kWh per annum
- 42W Compact Fluorescent = 156,919 kWh per annum
- LED 25W = 95,852 kWh per annum

The above baseline energy efficiencies were the figures submitted for the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by Endeavour Energy, therefore, these scenarios were submitted pending confirmation from WSROC’s technical advisor.

Energy Efficiency Improvement:

Energy savings from street lighting are very easy to predict because
the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above).

The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality.

940 x 18W “LEDs” (wattage 21.9w)

To calculate new energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

The new energy use is 88,889 kWh per year.

This project will save 299,951 per year (1,079,823 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

<table>
<thead>
<tr>
<th>Reporting Data (Measuring Energy Efficiency and Additional Data)</th>
<th>Percentage of the day lights are operational: 49.3%</th>
</tr>
</thead>
</table>
| Assumptions | • Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.  
• SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016  
• All savings and cost figures are GST Exclusive;  
• Operating hours of lights are 11.83 hours per day in NSW |

| Cost of Activity | $453,866 |
| Estimated Cost Savings | $1.24 million over 20 years or an average of $62,041 per year. |
The project included streets in the suburbs of Cecil Hills, Green Valley, Hinchinbrook, Busby, Heckenberg, Miller, Cartwright, Hoxton Park, West Hoxton, Carnes Hill, Edmondson Park, Rossmore, Denham Court, Bardia, Prestons, Casula, Wattle Grove, Holsworthy, Voyager Point, Pleasure Point, Moorebank, Lurnea, Liverpool, Warwick Farm, Chipping Norton, and Hornsby Park.

<table>
<thead>
<tr>
<th>Energy Efficiency Estimate Method</th>
</tr>
</thead>
</table>
| Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights. The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated. There are:

3,718 x 80W Mercury Vapour Lights (wattage 95.8w)

To calculate baseline energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

Baseline Energy Usage

1,537,986 kWh per annum

Baseline Energy Efficiency

- 2x14 W T5 = 527,246 kWh per annum
- 42W Compact Fluorescent = 753,739 kWh per annum
- LED 25W = 460,412 kWh per annum

The above baseline energy efficiencies were the figures submitted for the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by
Endeavour Energy, therefore, these scenarios were submitted pending confirmation from WSROC’s technical advisor.

**Energy Efficiency Improvement**

Energy savings from street lighting are very easy to predict because the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above).

The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality.

3,718 x 18W “LEDs” (wattage 21.9w)

To calculate new energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

The new energy use is 351,586 kWh per year.

This project will save 1,186,401 per year (4,271,043 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

**Reporting Data (Measuring Energy Efficiency and Additional Data)**

Percentage of the day lights are operational: 49.3%

Assumptions

- Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.
- SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016
- All savings and cost figures are GST Exclusive;
- Operating hours of lights are 11.83 hours per day in NSW

**Cost of Activity**

$1,889,423

**Estimated Cost Savings**

$4.84 million over 20 years or an average of $241,858 per year.
<table>
<thead>
<tr>
<th>Building, Facility or Site 7</th>
<th>Parramatta City Council</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Building, Facility or Site 7</td>
<td>The project included streets in the suburbs of Toongabbie, Parramatta, North Parramatta, Merrylands, Rydalmere, Pendle Hill, Old Toongabbie, Carlingford, Epping, Northmead, Constitution Hill, Wentworthville, Granville NSW, Ermington, Melrose Park, Dundas Valley, Eastwood, Dundas and Guildford</td>
</tr>
<tr>
<td>Location (address)</td>
<td>Public Street Lighting</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of Street Lighting</td>
</tr>
</tbody>
</table>

**Energy Efficiency Estimate Method**

Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights. The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated. There are:

- 966 x 80W Mercury Vapour Lights (wattage 95.8w)

  To calculate baseline energy use the calculation is:

  \[
  \text{Number of Lights} \times \text{Wattage} \times 365 \times 11.83 \div 1000
  \]

  \[
  966 \times 80W \text{ Mercury Vapour Lights (wattage 95.8w)}
  \]

  \[
  \text{To calculate baseline energy use the calculation is:}
  \]

  \[
  \text{Number of Lights} \times \text{Wattage} \times 365 \times 11.83 \div 1000 \text{ (to get to kWh)}
  \]

**Baseline Energy Usage**

- 399,595 kWh per annum

**Baseline Energy Efficiency**

- 2x14 W T5 = 130,924 kWh per annum
- 42W Compact Fluorescent = 187,166 kWh per annum
- LED 25W = 114,328 kWh per annum

The above baseline energy efficiencies were the figures submitted for the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by Endeavour Energy, therefore, these scenarios were submitted.
| **Energy Efficiency Improvement** | Energy savings from street lighting are very easy to predict because the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above).

The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality 966 x 18W “LEDs” (wattage 21.9w)

To calculate new energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

The new energy use is 399,595 kWh per year.

This project will save 308,247 per year (1,109,690 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced. |
| **Reporting Data (Measuring Energy Efficiency and Additional Data)** | Percentage of the day lights are operational: 49.3%

Assumptions

- Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.
- SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016
- All savings and cost figures are GST Exclusive;
- Operating hours of lights are 11.83 hours per day in NSW |
<p>| <strong>Cost of Activity</strong> | $466,607 |
| <strong>Estimated Cost Savings</strong> | $1.28 million over 20 years or an average of $63,768 per year. |</p>
<table>
<thead>
<tr>
<th><strong>Building, Facility or Site 8</strong></th>
<th><strong>Name of Building, Facility or Site 8</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location (address)</strong></td>
<td>Penrith City Council</td>
</tr>
<tr>
<td><strong>Type of building, facility or site</strong></td>
<td>Upgrade of Street Lighting</td>
</tr>
<tr>
<td><strong>Activity Type and Measure</strong></td>
<td>Upgrade of Street Lighting</td>
</tr>
<tr>
<td><strong>Energy Efficiency Estimate Method</strong></td>
<td>Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights. The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated. There are: 1,816 x 80W Mercury Vapour Lights (wattage 95.8w) To calculate baseline energy use the calculation is: Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).</td>
</tr>
</tbody>
</table>
**Energy Efficiency Improvement**

Energy savings from street lighting are very easy to predict because the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above).

The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality.

1,816 x 18W “LEDs” (wattage 21.9w)

To calculate new energy use the calculation is:

Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).

The new energy use is 171,727 kWh per year.

This project will save 579,479 per year (2,086,125 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

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**Reporting Data (Measuring Energy Efficiency and Additional Data)**

Percentage of the day lights are operational: 49.3%

**Assumptions**

- Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.
- SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016
- All savings and cost figures are GST Exclusive;
- Operating hours of lights are 11.83 hours per day in NSW

**Cost of Activity**

$873,889

**Estimated Cost Savings**

$2.39 million over 20 years or an average of $119,720 per year.
# Light Years Ahead

**FUNDING RECIPIENT:** Western Sydney Regional Organisation of Councils Limited  
**DATE:** 15 April 2016

## Building, Facility or Site 9

<table>
<thead>
<tr>
<th>Name of Building, Facility or Site 9</th>
<th>The Hills Shire Council</th>
</tr>
</thead>
</table>

### Location (address)

The project included streets in the suburbs of West Pennant Hills, Baulkham Hills, Castle Hill, Glenhaven, Kellyville, Beaumont Hills, Rouse Hill, Box Hill and Annangrove.

### Type of building, facility or site

Public Street Lighting

### Activity Type and Measure

Upgrade of Street Lighting

### Energy Efficiency Estimate Method

Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W Mercury Vapour to 18W LED lights) it is very simple to determine savings. Energy Use was calculated by street lighting experts Ironbark Sustainability. Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light and Ironbark have provided the following information from their independent financial analysis of Council’s street lights.

The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the Australian Energy Market Operator (AEMO). The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests. The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other, relevant parties. The results are then presented and published in load tables managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of bulbs for each council so that costs can be appropriately allocated.

There are:

- **1,631 x 80W Mercury Vapour Lights** (wattage 95.8w)

To calculate baseline energy use the calculation is:

\[
\text{Number of Lights} \times \text{Wattage} \times 365 \text{ (days/year)} \times 11.83 \text{ (hours operational per day based on the regulations cited above)} / 1000 \text{ (to get to kWh)}.
\]

### Baseline Energy Usage

674,679 kWh per annum

### Baseline Energy Efficiency

- 2x14 W T5 = 201,640 kWh per annum
- 42W Compact Fluorescent = 288,260 kWh per annum
- LED 25W = 176,080 kWh per annum

The above baseline energy efficiencies were the figures submitted for the original CEEP application. At the time the above three scenarios were modelled, 18W LED lights were yet to be approved by Endeavour Energy, therefore, these scenarios were submitted pending confirmation from WSROC’s technical advisor.

### Energy Efficiency Improvement

Energy savings from street lighting are very easy to predict because...
the exact number and type of lights and their operating conditions are well known, and do not change as it is regulated by AEMO (see above).
The new lights will be predominantly 18W LEDs (wattage 21.9w) in Category P (residential) streets throughout the municipality.
1,631 x 18W “LEDs” (wattage 21.9w)
To calculate new energy use the calculation is:
Number of Lights x Wattage x 365 (days/year) x 11.83 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).
The new energy use is 154,232 kWh per year.
This project will save 520,446 per year (1,873,601 MJ), which amounts to a saving of 77% relative to the existing lights that would be replaced.

<table>
<thead>
<tr>
<th>Reporting Data (Measuring Energy Efficiency and Additional Data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of the day lights are operational: 49.3%</td>
</tr>
</tbody>
</table>

Assumptions
- Energy price increases by 1.1% per year from 2014 to 2021, then increases by 6.75% per year for 10 years, then increases by 3.51% per year subsequently.
- SLUOS prices are as stipulated in Endeavour Energy’s Public Lighting Price List 2015-2016
- All savings and cost figures are GST Exclusive;
- Operating hours of lights are 11.83 hours per day in NSW

<table>
<thead>
<tr>
<th>Cost of Activity</th>
<th>$769,852</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Cost Savings</td>
<td>$2.12 million over 20 years or an average of $106,176 per year.</td>
</tr>
</tbody>
</table>
Attachment B: Calculation of Energy Efficiency Outcomes

Determining the energy efficiency and cost savings for street lighting projects is straightforward. Street lighting is an “unmetered load” with energy usage managed by the Australian Energy Market Operator (AEMO). The lights are all “standard”, all the same model and wattage, and all un-metered. So the procedure for determining the energy consumption is specified in Parts A and B of the National Electricity Market (NEM) Metrology Procedures. This means that the electricity use of the old and new technology and the energy efficiency savings are known in advance and guaranteed.

Methodology

The methodology for the calculation of energy volumes for such unmetered supplies is set out in the National Energy Market (NEM) Metrology Procedures, which are managed by the AEMO. The methodology relies upon knowledge of the energy consumption of each type of approved load at an unmetered connection point. The values for assumed energy consumption are obtained from power consumption tests.

The outcomes of these tests are agreed upon by AEMO, responsible persons, Registered Participants and other relevant parties. The results are then presented and published in “load tables” managed by AEMO. The load tables must be updated whenever a new unmetered device comes into use. It is from these load tables that retailers and network service providers are able to calculate energy use from unmetered supplies. This is undertaken by maintaining an inventory of lights for each council so that costs can be appropriately allocated.

AEMO provides a list of unmetered loads for each state under its jurisdiction. These loads are then used by the electricity distribution business to calculate energy usage for each load type. Endeavour Energy multiplies the load by the sunset to sunrise hours in that region over the relevant time in order to calculate total kWh.

Baseline energy usage

After WSROC received CEEP funding approval in 2014, WSROC has been working closely with Ironbark Sustainability on energy efficient street lighting planning and development. Over the last 2 years this has also involved liaison with the 9 participating councils and Endeavour Energy to assist with project managing the changing of street lights.

Baseline energy usage and efficiency outcomes have been calculated using the same methods and factors used by Endeavour Energy and by Ironbark Sustainability. These were reality checked against power and maintenance bills.
Inputs are very straight-forward – the number of lights (from council electricity bills) multiplied by wattage of each light. To calculate baseline energy use the calculation is:

\[
\text{Number of Lights} \times \text{Wattage} \times 365 \text{ (days/year)} \times 11.83 \text{ (hours operational per day based on the regulations cited above)} / 1000 \text{ (to get to kWh)}.
\]

To convert to MJ, multiply by 3.6

<table>
<thead>
<tr>
<th>Number of 80W MV Lights changed</th>
<th>13,951</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wattage of 80W MV</td>
<td>95.8</td>
</tr>
<tr>
<td>Operating hours of lights in NSW</td>
<td>11.83</td>
</tr>
<tr>
<td>Baseline energy use per annum (kWh)</td>
<td>5,770,965</td>
</tr>
<tr>
<td>Baseline energy use per annum (MJ)</td>
<td>20,775,475</td>
</tr>
</tbody>
</table>

For full information and data please refer to *Attachment A: Project Energy Efficiency Improvement Template*.

Figures are based on real street light data – bills and number of lights. The lighting stock that was replaced comprised solely of 80 Watt MV lights.

**Projected efficiency improvements**

Energy savings from street lighting are very easy to predict because the exact number and type of lights and their operating conditions are well known and do not change. The new lights are 18 Watt LEDs and to calculate new energy use the calculation is:

\[
\text{Number of Lights} \times \text{Wattage} \times 365 \text{ (days/year)} \times 11.94 \text{ (hours operational per day based on the regulations cited above)} / 1000 \text{ (to get to kWh)}.
\]

Multiply by 3.6 to convert to MJ

<table>
<thead>
<tr>
<th>Number of new LEDs</th>
<th>13,951</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wattage of new LEDs</td>
<td>21.9</td>
</tr>
<tr>
<td>Operating hours of lights in Victoria</td>
<td>11.83</td>
</tr>
<tr>
<td>New energy use per annum (kWh)</td>
<td>1,319,250</td>
</tr>
<tr>
<td>New energy use per annum (MJ)</td>
<td>4,749,300</td>
</tr>
</tbody>
</table>

This project will save 4,451,715 kWh per year (16,026,175 MJ), which amounts to a saving of 77% relative to old inefficient lights that have been replaced.

**Projected financial savings**

The ongoing cost savings generated after breakeven of the proposed retrofitting would deliver WSROC councils with an ongoing annual reduction in their expenses which could potentially be redirected to redress the needs of the WSROC low Socio Economic and disadvantaged communities.
The savings are significant. A total of $18.30 million will be saved over the 20-year period through reduced energy and maintenance costs. This amounts to an average expected saving of around $915,000 per year. These funds will be reinvested into the community and will improve economic output for councils and the country. The payback period is around 10 years.
THE ‘LIGHT YEARS AHEAD’ COMMUNITY ENGAGEMENT PROGRAM

Evaluation Report

Prepared for: Western Sydney Regional Organisation of Councils (WSROC)
May 2016
P09290
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1. INTRODUCTION AND OBJECTIVES

1.1 Introduction – Light Years Ahead

The Western Sydney Regional Organisation of Councils (WSROC) was funded by the Australian Government’s Department of Industry, Innovation and Science, through their Community Energy Efficiency Program (CEEP), to deliver the Light Years Ahead (LYA) project. The project entailed the replacement of high emission 80W mercury vapour street lights across the Western Sydney region, with low emission LED lighting. The project was delivered in nine Local Government areas, serviced by Endeavour Energy:

- Blacktown
- Blue Mountains
- Fairfield
- Hawkesbury
- Hills Shire
- Holroyd
- Liverpool
- Parramatta
- Penrith

The new lights consume up to 77% less energy compared to the current 80 watt mercury vapour street lights. It was anticipated that approximately 13,000 lights would be replaced. It was estimated that the exercise would reduce Western Sydney’s greenhouse gas emissions by approximately 74,000 tonnes over 20 years and reduce energy costs to the participant councils by approximately $21 million over the same 20 year period (the life of the LED light).

Major projects such as Light Years Ahead provide an excellent opportunity to engage local communities around energy efficiency. While the infrastructure works were intended to deliver significant energy savings, it was envisaged that additional energy savings could be made through associated community information activities. It was also understood that a considered communications effort could demonstrate council leadership in delivering energy efficiency for communities, raise awareness and create behaviour change among residents and others.

The Light Years Ahead communications strategy aimed to:

- Demonstrate the project’s results
- Raise awareness of energy efficiency through this Project
• Raise the profile of WSROC, councils, and the Federal Government within the Western Sydney community, positioning the project as a showcase or case study
• Engage with target stakeholders to share knowledge, experiences and lessons learnt
• Ensure the widest dissemination of knowledge from the project
• Engage, inform and excite the community about the program which is exclusive to their area
• Test different marketing/engagement techniques for a community sustainable energy program and collect data on the effectiveness of techniques
• Encourage widespread changes in attitudes and behaviour in the community with regard to efficient use of energy.

1.2 About the communications strategy

The communications strategy primarily targeted residents who reside in the nine participant council areas, though businesses, schools and others were secondary targets. Other core audiences (internal) targeted by the strategy were the nine participating councils, state and federal government agencies and staff (e.g. Department of Industry, Innovation and Science and the NSW Office of Environment and Heritage) and other local councils. The communications strategy included the following elements:
• Development of the Light Years Ahead Project website and e-newsletter
• Creation of a Light Years Ahead identity on social media (Facebook, Linkedin, Instagram, Twitter)
• Use of WSROC and partner Council websites, e-news and social media
• Development and distribution of fact sheets and posters
• Preparation of media releases and provision of story pitches to media organisations
• A booth featuring information about the LYA program and interactive displays and activities relating to energy efficiency (a purpose built model house, lighting display, power meters and an energy efficiency quiz), placed at ten separate established community events
• Official openings and launches (nine in total – one for each Council)
• Competitions (eg kids colouring competitions)
• Delivery of a seminar for school children at the Youth Eco Summit at Sydney Olympic Park.
• Delivery of a workshop for stakeholders at the NSW Energy Efficiency Conference 2015. The presentation and workshop included of summary the following:
  o Light Years Ahead: practical steps to make the switch to LEDs
  o Driving efficiencies in utility owned street lighting
  o How to build a robust business case for lighting
  o How to build relationships with utilities and other councils to benefit from collaborative efficiencies
  o How to efficiently and effectively implement the change through planning and communication.

WSROC coordinated the project communications on behalf of partner councils, including strategy development, marketing, promotion, internal communications, delivery, administration and reporting. The participating councils contributed to communications by dissemination marketing and information materials, and assisted with promotion of the project through existing council platforms such as websites, e-newsletters, community newsletters and social media. It is important to note that WSROC employed a part time media and communications professional in order to shape and deliver the communications strategy. Other WSROC officers also made important contributions to the communications program.

The strategy included ongoing internal communications with local Council stakeholders to ensure a comprehensive and consistent communications effort. A Light years Ahead brand and style guide has been developed in relation to graphic design elements, along with passages of carefully-worded text about the project, suitable for inclusion in electronic and hard copy resources such as complaints handling information for councils and an internal FAQ document.

1.3 Evaluation objectives

The evaluation set out to:
• Assess the effectiveness of the communications strategy and its component activities
• Highlight the contribution made by the communications strategy to the wider Light Years Ahead project
• Determine the response of householders and other stakeholders to the Light Years Ahead project – in terms of their support for the project and their level of engagement with communication activities
• Explore the behavioural responses of householders and other stakeholders
• Understand the process issues that enabled or inhibited good outcomes and the effectiveness of individual communications activities and approaches.
2. EVALUATION METHODS

Following is a description of the research and data collection activities that were undertaken:

- Analysis of program information including website statistics, media monitoring, communications log and program documentation.
- Ongoing consultation with WSROC and partner council officers (including those working in asset management, engineering, sustainability programs, marketing and communications).
- Formal in-depth interviews with council officers, Endeavour Energy and other consultants engaged by WSROC – a total of 19 interviews.
- An online survey of 15 visitors to the LYA booth at community events, using 67 email addresses harvested during the visit. People were offered a household energy savings kit if they participated, but the response of only 15 was disappointing.
- Collection of the observations of those staffing the community event booth.
- An online survey of a randomised sample of 217 householders in the participating LGAs, using a commercially available panel of willing research participants. The survey provided a good cross section of the Western Sydney community. Full details of the sample can be seen in the survey results included in Appendix A, however the sample included:
  - residents of all of the nine relevant LGAs
  - all age groups (from under 19s to over 65s)
  - an equal number of males and females
  - low, middle and high income earning households
  - a large number of households where a language other than English is spoken in the home (28%).
- Interviews with the teachers from seven schools that attended the Light Years Ahead seminar at the Youth Eco Summit.

Appendix B includes the various research instruments developed.
3. EVALUATION FINDINGS

3.1 Reach of the communications activity

**Media attention generated**

The following is a summary of the main media generated through the Light Years Ahead media strategy. It shows that there was widespread local newspaper and online news coverage of the project and active community interest in project information available online and via social media. The extent of the media coverage and the potential reach of these communications were noted by a number of stakeholders as a very good outcome and an indicator of the success of the communications program:

- A feature article in the Sydney Morning Herald, NSW News section (May 21, 2015)
- 81 other separate placements in over 20 different western Sydney local newspapers and online news services (with circulations ranging between 1,320 and 53,055)
- Articles in various industry magazines and websites
- 4,716 visitors to the Light Years Ahead website, including 267 views of the energy savings tips page
- 4,001 visits to the WSROC project page for Light Years Ahead
- 613 likes of LYA Facebook posts
- 486 Twitter followers
- 38 Instagram followers
- 181 LinkedIn followers
- 89 subscribers to the Light Years Ahead e-newsletter.

In addition, partner councils incorporated content in their own websites, Facebook pages etc.

It is also noteworthy that Louise Markus MP, Member for Macquarie, mentioned the Light Years Ahead project and WSROC in the Federal Parliament on June 1, 2015.

**Interest from external stakeholders**

WSROC maintaining a log of key stakeholder communication events, including requests made for information about the program. The log shows that the program communications alerted a variety of external entities to the existence of the program. It also shows that various actors across the sector have looked to Light Years Ahead as an example of good practice in driving energy efficiency in local communities. The following enquires were fielded by WSROC:
Seven requests from other Local Councils (and one private developer). The requests were for information and advice about LED technology, price and suppliers, negotiating with distributors and preparing a business case for a similar program. Endeavour Energy reported receiving similar requests.

Five requests for information made by journalists and researchers, including a request made by a researcher investigating the relationship between government and the private sector around sustainability issues.

Five requests for copy and other information, made by partner councils (noting that there was ongoing and more detailed additional communication between WSROC and partner councils).

Three requests from commercial entities that manufacture and/or sell lighting products.

One request for information made by a NSW Government agency.

Community awareness of Light Years Ahead
The media coverage outlined above, along with the attendance at community events and other activities helped to generate strong awareness of the Light Years Ahead project. **21% of those included in the sample survey of western Sydney households were aware of the Light Years Ahead program.** This in itself should be regarded as a good indicator of the success of the communications effort.

Awareness was generated through a variety of means and it was clear that the various elements of the communications strategy worked together to make people in Western Sydney aware of the program. Following are the survey results setting out the reported source of awareness of Light Years Ahead.

**Table 1. Source of awareness of Light Years Ahead**

<table>
<thead>
<tr>
<th>Source of awareness</th>
<th>Proportion of those aware (n=45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newspaper</td>
<td>40%</td>
</tr>
<tr>
<td>Social Media (Facebook or Twitter)</td>
<td>27%</td>
</tr>
<tr>
<td>Online or via a website</td>
<td>24%</td>
</tr>
<tr>
<td>Through friends or family</td>
<td>24%</td>
</tr>
<tr>
<td>Via my local Council</td>
<td>22%</td>
</tr>
<tr>
<td>Via a community event</td>
<td>16%</td>
</tr>
<tr>
<td>Through work</td>
<td>13%</td>
</tr>
<tr>
<td>E-newsletter</td>
<td>11%</td>
</tr>
<tr>
<td>Have seen the work being done to the street lights</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
</tr>
</tbody>
</table>

---

Evaluation of Light Years Ahead communication strategy: evaluation 30-May-16
3.2 Community response to community engagement activity

Community events
As already noted, WSROC staff and representatives of partner councils staffed a Light Years Ahead information display at nine community events across Western Sydney and in each of the participating local government areas. The events were as follows:

- Bicentenary of Penrith Festival
- Cabramatta Moon Festival
- Kings Langley Village Fair
- Rhododendron Festival, Blue Mountains
- PetFest, Holroyd/Merrylands (festival celebrating pets)
- Orange Blossom Festival, Castle Hill
- Springfest, Liverpool
- Australia Day celebrations, Parramatta
- Hawkesbury Agricultural Show (over three days).

At most events, it was estimated that around 200 people visited the display and interacted with the display and/or WSROC/Council staff. It was estimated that 500 people visited the booth at the Parramatta Australia Day event and that 1,200 people visited the booth at the Hawkesbury Show over the event’s three days. In total, close to 3,000 people were reached through the displays at community events.

There were a number of observations made by the WSROC officers who staffed the events:

- The booth attracted a good cross-section of community members.
- There was genuine curiosity on the part of event visitors and people wanted to know more about the LYA program.
- Some of the props (in particular the streetlight, model house and household lighting display) generated particular interest. Other props (eg the pool pump) proved too cumbersome to use and/or attracted less interest.
- People were particularly interested in talking with staff about household lighting choices and wanted information on the cost benefits of LED lighting.
- People also wanted to discuss the current arrangements and cost-benefits for household solar power (rebates, feed-in tariff etc) – while the LYA messages related to energy efficiency, it was clear that the community was also interested in renewables, and household solar in particular.
- The success of the events was somewhat dependent on the weather, the nature of neighbouring stalls and the location of the booth - one event was
deemed less successful due to the booth being placed in a low traffic, noisy area of the site.

- One event was attended by a large number of people with a first language other than English, making them hesitant to interact with WSROC/Council staff – this highlighted for staff the desirability of having a stronger multi-lingual focus in the communications strategy.

Of the people who attended a community event and responded to the survey, 33% said that the LYA display that they had seen was extremely interesting, 53% said that it was very interesting and 13% said that it was fairly interesting. No-one reported that the display was uninteresting.

A large majority of attendees thought that the LYA information and displays that they had seen at a community event provided a good overview of the LYA program and provided some good tips about energy efficiency in the home. The results are set out in the following figure

**Figure 1. Community perceptions of the LYA information and displays at community events**

<table>
<thead>
<tr>
<th>The information and displays provided some good information and tips about energy efficiency in the home</th>
<th>Strongly agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>67%</td>
<td>27%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The information and displays provided a good overview of the Light Years Ahead program</th>
<th>Strongly agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27%</td>
<td>47%</td>
</tr>
</tbody>
</table>

Respondents were asked about what they found interesting at the event booth and a selection of responses is set out below. It was clear that there was a genuine interest in the new street lights and the cost benefits for communities. It was also clear that the friendly and passionate outlook of the people staffing the booth was important in engaging people:

"That someone was actually there spreading the news of energy saving devices and methods was great”.

“The street lights were fascinating”.

“I was surprised how much money will be saved by LED street lamps”.
"Seeing the difference between the bulbs in front of us and the light output not varying much. And showing the actual monetary/financial cost difference was great too. The staff at the stall where friendly and very up beat and passionate about the cause and the messages they where getting across (not just selling some random thing they have been told to sell) they had a real passion for it”.

“Really interesting to see the savings between two different lights some even brighter than the more expensive older technology version. And really shows you the savings between the lights and that you don’t have to give up brightness for energy efficiency you can have both at the same time. All while smiling to the happy lady at the stall"

“Speaking to the lady who we found very informative and a lovely person to speak with”

Youth Eco Summit
The Youth Eco Summit (YES) is a curriculum-based sustainability festival for school students and their teachers. Recognised by the United Nations and the NSW Office of Environment & Heritage, YES promotes student leadership and features student sustainability practices. The annual event, held at Sydney Olympic Park, includes interactive displays and experiences, student and school showcases, and free teaching resources. The 2015 event provided a good opportunity to use Light Years Ahead as a focal point for delivering energy efficiency messages to young people. The event is attended by around 6,000 school students.

WSROC was invited to attend to run an energy efficiency based workshop and to showcase the Light Years Ahead Project to both primary school and high school students over 2 days. Back-to-back education workshops were provided for groups of approx. 20-40 children and their teachers. Activities were mapped to the school curriculum and focused on energy-savings in the home through a sketching activity.

Nine schools participated (approx. 273 students) from the following schools:

- Burwood Girls High School
- Plumpton Public School
- Grose View Public School
- Peninsula Community of Schools
- Bankstown Public School
- Canterbury South Public School
- Baulkham Hills High School
- St Benedicts Catholic College
Seven teachers who accompanied their students to the Youth Eco Summit were asked about aspects of the LYA information sessions that they had attended. All of the teachers interviewed expressed praise for the LYA session. They reported that the session was very well presented, was highly engaging for students and was relevant to the school curriculum. The following quotes were typical:

“It was an interesting topic for our kids and I think they got a lot out of it. Actually it was excellent and they really enjoyed it. They liked designing their own house.”

“It was very good. It was engaging, it got them to design their own sustainable house and taught them how to make it more energy efficient.”

“Our kids were engaged and interested. I think the messages the students got were about sustainability and particularly about energy saving.”

“The presenters were really good. Our kids were in year 10 and though quiet, they were engaged.”

“The speakers were good and they were clear and enthusiastic. The activities were clear too. The kids were engaged. Sometimes I’ve seen better 3D models of house, but overall I have no complaints.”

“Really well delivered. Good presenters Yes the kids were engaged. Nothing could have been done better.”

“It was very good and very effective. The topics were good. It was aimed at a good level, unlike other [Youth Eco Summit presentations] which I felt were aimed too low. Our students were on an accelerated learning program so they are pretty demanding and they all enjoyed it.”

Teachers also reported that attendance at the LYA session had sparked further discussion and activities in the classroom, relating to energy efficiency. This should be regarded as a positive outcome and an indicator of the value of the activity:

“We had a meeting the first week back and we talked about what we had learnt, and the kids wrote a report for the school newsletter.”

“We all went back to school and we did more work on the design of the house.”

“Very relevant to the new curriculum. We had a chat about it afterwards and used it in lessons about how it related to a project we were doing on building a sustainable house.”
3.3 Behavioural responses to engagement with Light Years Ahead messages

The results of the community survey showed that there has been strong community response to the messages communicated through LYA. Just over half of those aware of the program (53%) said that since hearing about LYA, they had thought about making changes to the way they use energy at home. Most (49%) reported that they haven’t made those changes yet. Just 4% of those aware of LYA (or 1% of all households in Western Sydney) said that they had made some energy efficiency improvements in their homes as a result of their exposure to LYA. These results are set out in the following chart.

Figure 2. Awareness of and response to Light Years Ahead

The proportion of all householders in Western Sydney whose behaviour has been influenced may appear low but should be interpreted positively given the nature and scale of the communications effort. It should also be acknowledged that it not easy to create community-wide behaviour change and that reasonable expectations should be set for what could have been achieved. Nonetheless, the results show that a large number of people in Western Sydney have at least contemplated change as a result of the program and this translates to a very large number of households in Australia’s most populous region.

The results of the survey of attendees at community events better shows the potential of the LYA messages and communications approach to influence behaviour. Two-thirds of those surveyed said that they had made some changes in
their homes as a result of attending the LYA display. These actions included the following:

- Installing LED lights in the house (the most common response)
- Turning lights off when not in use
- Improving home insulation.

In addition, people reported that they had learned from their time interacting with the display and talking to the people staffing the booth. Most commonly, people reported that they had learned about the relative efficiency of LED light globes but people also made reference to some other energy-saving measures:

“Ways to improve energy efficiency such as draft excluders and laminate on windows.”

“The difference in the cost of running normal light and energy saving lights.”

“We can all reduce our consumption/usage.”

“I learnt about the new energy saving globes, and how they can save heaps on the power bill compared to the old filament type, and even the swirly energy saver globes.”

“I consider myself to be fairly mindful of the cost of electricity. I don’t leave lights on when no-one is in the room and am currently using compact fluorescent globes that were given out so freely at shopping centres some years ago.”

“I learnt that certain light bulbs cost more money to run than others. I also learnt that by keeping the draft out, I could save on heating and that the solution was so cheap and simple!”

**3.4 Community support for Light Years Ahead**

The results of the community survey show strong and widespread community support for the LYA program. A large majority of people agreed that, among other things, they personally supported the program, thought it was important for Western Sydney and that governments should be doing more of these sorts of things. The results are set out in the chart below.
People who attended the various community events were even more strongly supportive of the LYA initiative. Upwards of two-thirds of respondents strongly agreed with the propositions above.

Survey respondents were asked if they had any concerns about the Light Years Ahead project. Most people simply said that they had no concerns or else used the opportunity to reiterate their support for the program, for example:

“I think it is a great idea and councils should be doing all they can to make our cities more sustainable and environmentally friendly which in turn usually saves money.”

“Very progressive thinking towards sustainability and budget saving.”

“It is good for the environment and would save money to the government.”

“I wish all councils take the same steps not just Western Sydney.”

A few people expressed some concerns relating to the following three issues:

- The impact on traffic whilst lights are being replaced
- Whether the cost of the street light replacement would be passed on to ratepayers (and result in an increase in rates)
- Whether the lights will be the same brightness as existing lights.
3.5 Stakeholder observations

Partner councils and other stakeholders provided a range of comments and observations relating to the communications component and the wider LYA program.

Stakeholders noted the importance of the communications strategy as a component of the wider program. It was seen to have been effective in ensuring a strong ongoing partnership between councils and other stakeholders, to ensure community support for the program, to promote the benefits of the program and the sustainability leadership provided by Local Councils. The coordinating role played by WSROC was seen as enormously valuable. Stakeholders expressed the view that the communications strategy was led in a very professional way and minimised the burden on individual councils. Following are some typical quotes:

“Everyone knew what was going on – there were strong communications. You need that with a program like this.”

“Yeah, really professionally done. They did a great job with it. It really saved us a lot of time and made sure there weren’t conflicting messages out there. It could have been really confusing for the community. We just picked up the stuff [communications materials] and incorporated it into our messages.”

“I wasn’t that close to the communications but from what I could see, it was really good. It was a good opportunity to tell people about what we’re doing and to get them on board.”

Stakeholders were very satisfied with the quality of the information materials produced and made good use of the materials by including them in Council newsletters, putting posters up in libraries and other places and incorporating content into Council websites. The factual basis used for the communications (rather than ‘spin’) was seen as a strength of the materials that were prepared.

Some informants thought that social media could have been used even more effectively and others thought that there could have been more local workshops or a project ambassador used – on balance though, the mix of activity was thought to be ‘about right’

Stakeholders noted the widespread and positive attention given to the project by the media and put this forward as an indicator of the success of the communications and media strategy. According to stakeholders, the project has provided excellent public relations value for councils and other stakeholders and Council leadership has been eager to support and promote the project. The absence of complaints from the community was also put forward as an indicator of the success of the communications effort.
“There were no [community] complaints which is always a good sign.”

“The mayors loved it – well ours did anyway. There were some great photo opportunities and they saw it as a really good-news story.”

“You’ve got to have support from the leadership for these sorts of initiatives. All the consultation and coordination made sure that this happened.”

“Just all the media attention. It seemed like there was always something in the paper.”

The project has reportedly also provided a reason for councils to talk to the community about energy efficiency and general sustainability issues, and to do with some authority. A couple of informants noted that local councils had, for years, been trying to engage with their communities around energy efficiency issues – the Light Years Ahead program reportedly provided a point of interest and made the task much easier.

The project has reportedly helped to develop support for sustainability initiatives within councils. The clear financial business case, along with the clear environmental benefits ensured a high degree of buy in from all areas within council. Most of the councils interviewed had already noticed significant savings and were widely publicising this outcome. It was thought that future sustainability initiatives might be given more consideration in future, given the success of the LYA program. Again, some typical quotes follow:

“It’s such a no brainer. Often sustainability issues are but you’ve got to spell it out in financial terms.”

“We’ve seen a huge saving already. It’s not hard to see the benefits.”

The project has allowed staff within councils to work more closely with their colleagues in other sections, and to work collaboratively with their peers in other councils. It was reported that stronger working relationships and more information sharing has resulted. For some, the program provided the first opportunity to work with WSROC and this was also noted as a positive outcome of the program. As one person said:

“I’ve never had anything to do with WSROC before. It’s been a great experience. You feel like you’re not chipping away on your own.”

It was reported that councils have developed a greater understanding of the commercial dynamics involved with purchasing energy and paying maintenance costs. Councils reportedly developed more confidence in their ability to negotiate
with the distributor and to work in partnership in order to achieve a particular financial outcome.

It was suggested that Endeavour Energy could have played more of a role in distributing information about the project through its customer networks. The Endeavour work crews had information flyers that they could hand out to community members if asked, but it was thought that Endeavour could have more actively promoted the program. It is important to note that an Endeavour Energy representative reported an eagerness to take a more active interest in the communications component of any future iteration of the program.

Stakeholders noted that a particularly good outcome from the project was that Western Sydney councils were in the process of planning an expanded roll-out of the program (Light Years Ahead stage 2). It was noted that this was being pursued without grant funding and purely on the basis of the known return on investment period. Some stakeholders added that creating this ‘legacy’ could have been stipulated as an aim from the outset. As already noted, the collaboration was an important ingredient in the program’s success. It was noted that negotiating with an energy distributor is done much more easily on a regional or collective basis. It was reported that Light Years Ahead provided an extremely good model for coalitions of councils to pursue energy efficiency projects in partnership with their energy distributor. It was noted that many local councils were looking to WSROC and the Light Years Ahead project as a model of good practice and were eager to emulate it in their own LGA or region.
4. SUMMARY AND CONCLUSIONS

The Light Years Ahead communications and community engagement program was a crucial component of the wider street light replacement program. It can be viewed as the ‘glue’ that held the partnership together and that has provided the basis for ongoing collaboration between Western Sydney councils around sustainability issues. With a limited budget, the strategy has clearly and professionally communicated the benefits of the program so as to ensure strong community awareness and support. The communications effort has helped to raise awareness of energy efficiency within the Western Sydney community and to stimulate active consideration of implementing energy efficient products and practices within households. The communications strategy has also attracted the interest of community members and representatives in other geographic areas.

Some key findings from the evaluation provide indicators of the success of the communications strategy:

- Communications ‘products’ were widely adopted by partner councils.
- There was significant media interest in the program with 82 print articles written and included in over 20 publications.
- There was strong visitation to the LYA website (4,716 visits), strong visitation to other websites carrying LYA content and extensive social media activity (for example, 613 Facebook ‘likes’ and 486 Twitter followers).
- There was engagement with around 3,000 people via the Light Years Ahead booth at nine community events across Western Sydney, including people from low, middle and high household income groups.
- There was engagement with 273 students from nine schools via the workshops delivered at the Youth Eco Summit that resulted in further attention given to energy efficiency back in the classroom.
- One in five people (21%) in Western Sydney were aware of the LYA program by the program’s completion – with similar levels of awareness among people from low, middle and high household income groups.
- Based on the survey research, 10% of all people in Western Sydney had considered making some changes in their household as a result of learning about Light Years Ahead and one per cent had actually made some change.
- Based on a small survey of those who attended the LYA booth at community events two thirds of visitors reported having made some change in their household, most commonly the use of LED lights.
- A large majority of people in Western Sydney supported the project – 81% personally supported it and thought that ‘governments should be doing more of this sort of thing’.

The communications strategy effectively targeted low, middle and high income households, as is evidenced by the profile of people attending the LYA at community events and the even level of awareness generated across the income
groups. There was some evidence to suggest that more could have been done (had time and resources allowed) to target people with a first language other than English. There were some missed opportunities to engage with other language groups, at community events for example, brought about by the diverse cultural and spoken language profile in Western Sydney and the limited capacity to provide information in other languages. There also could have been a stronger effort to liaise with ethnic media in order to see the Light Years Ahead messages communicated through those channels.

The mix of communications activities can only be viewed as appropriate. It was clear that the different communications channels used contributed to the high level of community awareness that was observed. Although labour intensive, the information booth at community events appeared to be a particularly effective means of more fully engaging with people. This allowed a deeper conversation about energy efficiency and to provide the stimulus required to initiate some action on the part of householders. Although based on small number, the two thirds of people who attended the booth that made some household changes far exceeds the small percentage of people who made some change after hearing about the LYA program through other means.

The importance of the coordinating role played by WSROC should be reiterated. Central coordination of communications activity has the advantage of ensuring consistent messaging and strong branding. It also minimised the burden on partner councils. Regional bodies (such as WSROC) are clearly well positioned to play this role and should be supported to maintain the capacity required to provide leadership and a professional service to the councils and communities that they represent.
## Attachment D: Postcodes Suburbs Lighting changeover

<table>
<thead>
<tr>
<th>Council</th>
<th>The project included streets in the suburbs of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Mountains City Council</td>
<td>Katoomba 2780, Leura 2780, Linden 2778, Faulconbridge 2776, Springwood 2777, Valley heights, Winmalee 2777 and Yellow Rock 2777</td>
</tr>
<tr>
<td>Parramatta City Council</td>
<td>Toongabbie 2147, Parramatta 2150, North Parramatta 2151, Merrylands 2160, Rydalmer 2116, Pendle Hill 2145, Old Toongabbie 2146, Carlingford 2118, Epping 2121, Northmead 2152, Constitution Hill 2145, Wentworthville 2145, Granville 2142, Ermington 2115, Melrose Park 2114, Dundas Valley 2117, Eastwood 2122, Dundas 2117, Guildford 2161</td>
</tr>
<tr>
<td>Hawkesbury City Council</td>
<td>Wilberforce 2756, Pitt Town 2756, Windsor 2756, South Windsor 2756, Clarendon 2756, Bligh Park 2756, Oakville 2756, Vineyard 2756, Cornwalls 2756, Windsor Downs 2756 and Freemans Reach 2756</td>
</tr>
<tr>
<td>Liverpool City Council</td>
<td>Cecil Hills 2171, Green Valley 2168, Hinchinbrook 2168, Busby 2168, Heckenberg 2168, Miller 2168, Cartwright 2168, Hoxton Park 2171, West Hoxton 2171, Carnes Hill 2170, Edmondson Park 2174, Rossmore 2557, Denham Court 2565, Bardia, Prestons 2170, Casula 2170, Wattle Grove 2173, Holsworthy, Voyager Point 2172, Pleasure Point 2172, Moorebank 2170, Lurnea 2170, Liverpool 2170, Warwick Farm 2170, Chipping Norton 2170, Hornsby Park 2171</td>
</tr>
<tr>
<td>Fairfield City Council</td>
<td>Bonnyrigg Heights 2177, Edensor Park 2176, Bonnyrigg 2177, Greenfield Park 2176, Bossley Park 2176, Wetherill Park 2176, Smithfield 2164, Prairiewood 2176, St Johns Park 2176, Wakeley 2176, Canley Heights 2166 and Canley Vale, 2166, Bonnyrigg Heights 2177</td>
</tr>
<tr>
<td>Holroyd City Council</td>
<td>Merrylands 2160, Merrylands West 2160, South Wentworthville 2145, Wentworthville 2145, Smithfield 2164, Woodpark 2164, Guildford West 2161, Greystanes 2145, Mays Hill 2145 and Pendle Hill 2145</td>
</tr>
<tr>
<td>The Hills Shire Council</td>
<td>West Pennant Hills 2125, Baulkham Hills 2153, Castle Hill 2154, Glenhaven 2156, Kellyville 2155, Beaumont Hills 2155, Rouse Hill 2155, Box Hill 2765 and Annangrove 2156</td>
</tr>
<tr>
<td>Penrith City Council</td>
<td>Orchard Hills 2148, Erskine Park 2759, Cranebrook 2749, Kingswood 2340, Colyton 2760, Werrington County 2747, Llandilo 2747, Penrith 2750, Cambridge Park 2747, Werrington 2747, St Clair 2759, Castlereagh 2749 and Jordan Springs 2747</td>
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</tbody>
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