This activity received funding from the Australian Government.
## Contents

Executive Summary .................................................................................................................. 2  
Project Objectives .................................................................................................................. 3  
Project Energy Efficiency Activities ....................................................................................... 3  
  Details of energy efficiency upgrade ..................................................................................... 3  
  Choice of technology ........................................................................................................... 3  
  Activity issues .................................................................................................................... 4  
Project Demonstration and Communications Activities ....................................................... 4  
  Target audience and stakeholders ....................................................................................... 4  
  Key Communication Messages ........................................................................................... 5  
  Communications Activity ................................................................................................... 6  
Outcomes and benefits of the Project .................................................................................... 7  
  Overcoming Issues and Lessons Learnt ............................................................................... 7  
  Energy efficiency results ..................................................................................................... 8  
  Community and Other Benefits .......................................................................................... 9  
Budget .................................................................................................................................... 10  
Project operation, mechanisms and processes ................................................................... 12  
  MAV Procurement ............................................................................................................. 12  
  Economies of Scale .......................................................................................................... 13  
  Internal Resources and Lessons .......................................................................................... 13  
Conclusion ............................................................................................................................ 14  
Declaration ............................................................................................................................. 14
**Executive Summary**

As part of the Green Street Lighting project a total of 1,340 street lights were upgraded to more efficient technologies. These replacements are predicted to reduce Council’s electricity use by 378,030 kWh per year and annual emissions by more than 400 tonnes. The upgrade will save Council approximately $70,000 in the first year and $3.5 million over the life of the lights (15 years).

The lights were implemented in two stages. Between September 2013 and March 2014, 1,238 mercury vapour streetlights were replaced with energy efficient T5 fluorescent equivalents on local roads across the Shire. In June 2014, Council utilised remaining funds from the program to replace 80 decorative mercury vapour street lights with energy efficient compact fluorescent equivalents in some heritage areas in Leongatha, Korumburra and Poowong. During the same period a further 22 mercury vapour streetlights in car parks and parks across the shire were replaced with efficient T5 fluorescents.

Community interest in the Green Street Lighting project has been high with project benefits being promoted throughout the life of the project. Based on the readership of local papers it is estimated that approximately 5,500 people or 20% of the population of South Gippsland Shire have been reached through the engagement activities of the Green Street Lighting Project. This has led to the South Gippsland Shire Council being seen as a sustainability leader and illustrates the importance of saving energy and reducing greenhouse gas emissions to the community.

The Green Street Lighting project was achieved under the original projected budget. Original total project costs were estimated to be $606,821 with $172,812 (one third) being contributed by the Australian Government. At the conclusion of the project the total project costs were $534,221, resulting in a saving of $72,600. This activity was funded jointly by Council and the Australian Government. The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.
**Project Objectives**

The South Gippsland Green Street Lighting Project aimed to replace a large number of inefficient street lights with more efficient alternatives. The objectives that this upgrade aimed to achieve were;

- Maximisation of energy savings within the project budget
- Maximisation of greenhouse gas reduction
- Reduction in Council electricity costs
- Improved quality of street lighting to benefit the community
- Compliance with proper procurement processes (as per the requirements of the Local Government Act)
- Use of approved, safe and thoroughly assessed lighting technologies
- Communication of information on the benefits of the project to residents, businesses and community organisations about saving energy and reducing greenhouse gas emissions
- Engagement of industry (in particular the Distribution Network Service Provider, SP Ausnet and lighting manufacturers) by demonstrating how these projects can be successful

**Project Energy Efficiency Activities**

South Gippsland Shire Council has improved the energy efficiency of its street lights in residential streets (Category P lights) covering approximately 1,850 km of road network by completing a bulk upgrade to a more efficient technology.

**Details of energy efficiency upgrade**

In total, 1,260 80W mercury vapour fixtures were replaced with 2x14W T5 fixtures and 80 decorative mercury vapour fixtures were replaced with decorative 42W compact fluorescent fixtures. 22 of the upgraded lights were in Council parks and car parks with the rest being throughout Council’s local roads network. See Attachment 1 for a list of the roads and suburbs where lights have been upgraded.

The energy efficient technology options were somewhat limited with this project due to the fact that they were being installed on the network owned by SP Ausnet and therefore had to be an approved distribution business street light. There were two options at the time of hardware purchase (LED lighting has since been approved for use on the network) for replacing inefficient 80W MV lights. These were the T5 linear fluorescent and the compact fluorescent. Both fittings had obtained technical approval from distribution businesses, and were a suitable replacement for 80W MV lights at standard heights and spacing.

**Choice of technology**

The 2x14W light was chosen for the bulk of the lighting replacements due to the higher level of energy reduction achieved from the light compared to the CFL (30.2 Watts, compared to 36.6 Watts). This therefore leads to a better energy efficiency outcome for the project and also higher cost savings for Council. The 42W compact fluorescent lights were used for the replacement of the decorative style lights only, as the shape of the T5 light is not suitable for a decorative fitting.
Aesthetic considerations were also taken into account when choosing the technology to install. The compact fluorescent luminaire is roughly the same size and shape as the old MV luminaires, whereas the T5 has a slimmer and more linear appearance. Even though the T5 lights look slightly different from the old lights it was decided that the additional energy savings had priority over aesthetics. The general population rarely notices the appearance of street lighting, as lights are typically mounted at a height of 7.5 metres. From such a height, and in the context of poles, wires and other pole mounted infrastructure, lights appear insignificant.

Activity issues

Overall the energy efficient lights installed have been very successful. Some lights were found to be faulty at the point of installation. As the issue was identified before they were installed, the faulty lights were immediately replaced by the supplier. There have been no faulty lights identified since installation.

There has been a handful of (approximately 5) resident complaints about the new lights being too bright. This is most likely due to the fact that the old lights were not operating at the standard deemed necessary as they were overdue for an upgrade. The new lights also direct more light towards the ground where it is needed instead of spilling it upwards. Council compiled a letter of response for any residents who had this complaint – see Attachment 2 for a copy of this letter.

Project Demonstration and Communications Activities

The Green Street Lighting project presented Council with a great opportunity to inform residents of our commitment to reducing greenhouse gas emissions and helped to solidify Council’s role as a leader in the community around issues relating to sustainability and combatting climate change.

Communications with project partners (SP Ausnet, third party contractors and the Department of Industry) during the works was another important consideration to ensure there were clear lines of communication, clarity regarding specific roles and that reporting requirements were completed as required.

Target audience and stakeholders

The target audience and stakeholders involved in this project can be split into two broad target audience areas.

1. The community
   - South Gippsland residents
   - Other Local Government bodies
   - Council Staff
   - Local Environmental Groups
   - Local commercial and industrial businesses
   - Local Media Outlets
   - Other government departments and agencies (such as Department of Environment and Primary Industries (DEPI), Sustainability Victoria (SV) and Department of Planning and Community Development (DPCD)
2. Project partners
- Executive Leadership Team (ELT)
- Councillors
- Council Administrators
- SP Ausnet
- Department of Industry
- Municipal Association of Victoria (MAV) Procurement
- Ironbark Sustainability

**Key Communication Messages**

The Green Street Lighting project is a good-news story.

The key message is around the benefits of energy efficiency and how it positively contributes to mitigating climate change, transitioning to a low carbon future and reducing operating costs.

The messages were kept clear and simple.
Overall messages:

- Energy efficiency is a key element to reducing greenhouse gas emissions
- South Gippsland Shire Council are leading the way in reducing greenhouse emissions and responding to climate change
- Energy efficiency reduces living and operating expenses
- Energy efficiency is securing a low carbon Australia for future generations
- The Green Street Lighting project is the single largest project council can implement to reduce electricity costs
- The reduction in energy costs can allow councils to direct more resources into other public amenities

The project involves:
- Replacing approximately 1,300 street lights with energy efficient alternatives

The project will:
- Reduce annual greenhouse gas emissions by at least 400 tonnes (equivalent to approximately 100 cars)
- Reduce energy use by approx. 60%
- Save at least $60,000 per year
- Achieve cost savings over the life of the assets of around $3.5 million
- Meet all Australian Standards in regards to safety and light levels
- Align with councils’ environmental sustainability strategies

The new lights will have:
- Greater uniformity of light across and along the street
- Better colour rendering and visibility
- Less depreciation of the light output over time, and
- Lower glare
Communications Activity

A number of tools were used throughout the life of the project to communicate the key messages of the project to the community and project partners.

The table below lists the communications activities chronologically throughout the project - please see the relevant attachments for details.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Primary Audience</th>
<th>Date</th>
<th>Attachment #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation – Information on opportunities</td>
<td>Council officers – Gippsland Climate Change Network</td>
<td>15/12/2011</td>
<td>3</td>
</tr>
<tr>
<td>Briefing paper – introduction of project idea</td>
<td>ELT</td>
<td>01/03/2012</td>
<td>4</td>
</tr>
<tr>
<td>Presentation – introduction of project idea</td>
<td>ELT</td>
<td>01/03/2012</td>
<td>5</td>
</tr>
<tr>
<td>Briefing paper – introduction of project idea</td>
<td>Councillors</td>
<td>07/03/2012</td>
<td>6</td>
</tr>
<tr>
<td>Presentation – introduction of project idea</td>
<td>Councillors</td>
<td>07/03/2012</td>
<td>7</td>
</tr>
<tr>
<td>Report – introduction of project idea</td>
<td>Councillors</td>
<td>28/03/2012</td>
<td>8</td>
</tr>
<tr>
<td>Briefing paper – Update re change of funding opps (no State grant)</td>
<td>ELT</td>
<td>11/05/2012</td>
<td>9</td>
</tr>
<tr>
<td>Briefing paper – financial considerations in light of change in funding opps</td>
<td>ELT</td>
<td>28/06/2012</td>
<td>10</td>
</tr>
<tr>
<td>Briefing paper – Council contribution options</td>
<td>Councillors</td>
<td>18/07/2012</td>
<td>Confidential report so not attached</td>
</tr>
<tr>
<td>Presentation – Council contribution options</td>
<td>Councillors</td>
<td>18/07/2012</td>
<td>Confidential so not attached</td>
</tr>
<tr>
<td>Report – Council decision on contribution</td>
<td>Councillors</td>
<td>25/07/2012</td>
<td>11</td>
</tr>
<tr>
<td>Article – Sustainability Network newsletter</td>
<td>Environmental Groups</td>
<td>1/08/2012</td>
<td>12</td>
</tr>
<tr>
<td>Press release</td>
<td>South Gippsland residents</td>
<td>1/08/2012</td>
<td>13</td>
</tr>
<tr>
<td>Report – approval of procurement process</td>
<td>Councillors</td>
<td>19/12/2012</td>
<td>Confidential so not attached</td>
</tr>
<tr>
<td>Press release</td>
<td>South Gippsland residents</td>
<td>01/02/2013</td>
<td>14</td>
</tr>
<tr>
<td>Council website</td>
<td>South Gippsland residents</td>
<td>01/03/2013</td>
<td>15</td>
</tr>
<tr>
<td>Council internal news – update on project progress</td>
<td>Councillors</td>
<td>06/03/2013</td>
<td>16</td>
</tr>
<tr>
<td>Presentation – to staff at directorate meeting</td>
<td>Council staff</td>
<td>23/04/2013</td>
<td>17</td>
</tr>
<tr>
<td>Council website</td>
<td>South Gippsland residents</td>
<td>01/06/2013</td>
<td>18</td>
</tr>
<tr>
<td>Sustainability section of Council website</td>
<td>South Gippsland residents and Environmental Groups</td>
<td>01/06/2013</td>
<td>19</td>
</tr>
<tr>
<td>On hold message – for residents calling Council Customer service centre</td>
<td>South Gippsland residents</td>
<td>1/07/2013</td>
<td>20</td>
</tr>
<tr>
<td>Press release</td>
<td>South Gippsland residents</td>
<td>1/08/2013</td>
<td>21</td>
</tr>
<tr>
<td>Frequently Asked Questions form</td>
<td>South Gippsland residents</td>
<td>1/09/2013</td>
<td>22</td>
</tr>
<tr>
<td>Toilet poster</td>
<td>Council staff</td>
<td>1/10/2013</td>
<td>23</td>
</tr>
</tbody>
</table>
The communications activities proved very successful. Local press releases were picked up by the two local papers – the Sentinel and the Star. Based on the readership of local papers it is estimated that approximately 5,500 people or 20% of the population of South Gippsland Shire have been reached through the engagement activities of the Green Street Lighting Project. The press release regarding the completion of the project was also picked up by local news channel WIN news who requested an interview. The population of South Gippsland Shire (according to the last Census data) is 27,500 and a large majority of the population watch local television channels.

**Outcomes and benefits of the Project**

In total, 1,340 80 Watt Mercury Vapour street lights were replaced with energy efficient fixtures. 1,260 of these were replaced with Twin 14 Watt T5 fixtures and 80 were replaced with decorative 42 Watt compact fluorescent fixtures (these were to replace already existing decorative style lights).

The works were originally scheduled to occur over two stages, the first comprising of 665 lights and the second of 745 lights. Due to delays in commencement, what effectively occurred was a continuous single stage that ran between September 2013 and March 2014.

In June 2014, Council utilised remaining funds from the program to replace 80 decorative mercury vapour street lights with energy efficiency compact fluorescent equivalents. During the same period a further 22 mercury vapour lights were replaced in Councils parks and car parks.

The energy efficiency improvement from the project will be 378,030 kWh per year or over 400 tonnes of carbon dioxide equivalent in greenhouse gas emissions. This equates to a saving of approximately $70,000 per year and up to $3.5 million over the life of the lights (15 years). The Council anticipates the Project Payback period of the Project will be 5 years based on the contribution to the project from the Council budget.

**Overcoming Issues and Lessons Learnt**

Stage 1 of the installation work was originally planned for completion in August 2013. There were a number of documents (network modification agreement, lighting maps and project plan) that needed to be either approved by or provided by the Distribution Business SP Ausnet before works could begin.
This approval process was estimated to take 2 weeks, but actually took 6 months. There was no good reason for this delay and it was completely out of the hands of the project team. Persistence with following up and speaking with the correct people within SP Ausnet was the only course of action. All of the required documents were provided and approvals given by August 2013. The project team had all other elements ready to go and installation therefore started almost immediately in September 2013.

At project commencement it was anticipated that a total of 1,410 street lights would be replaced across local roads in South Gippsland. 1,340 lights upgraded was the end result. These discrepancies are the result of differences between SP Ausnet’s Geographical Information System (GIS) records of street lighting and what actually exists in the field. Included in these discrepancies were a relatively large number of decorative 80 Watt Mercury Vapour streetlights where standard streetlights were expected according to the SP Ausnet maps. These lights were not eligible/compatible for replacement with energy efficient T5 street lights and as such resulted in a drop in the actual lights changed over during stages 1 and 2 of the works. 80 of the decorative 80 Watt Mercury Vapour streetlights were changed over during June 2014 using unspent funds.

There were also a number of access issues during the installation phase of the project. No access issues are common for bulk change projects; however they are especially prevalent in rural areas where streetlights can be set back a significant distance from the road reserve. During sustained periods of wet weather, the heavy elevated work platform vehicle used to change over lights cannot travel across grassed areas due to the potential to either become bogged or cause significant surface damage. This meant that there were delays as installation had to be put on hold during periods of inclement weather.

From the time of its commencement in September 2013, Stages 1 and 2 of the changeover project were expected to take 14 weeks to complete, giving a completion date of 13 December 2013. In hindsight, such a short timeframe for completion was unlikely given inevitable delays due to inclement weather, sick days and emergency call outs requiring the attention of the installation contractor to be temporarily diverted from the project.

**Energy efficiency results**

The energy efficiency improvements were estimated to be 393,680 kWh per year at the start of the project. This figure was based on upgrading 1,410 lights. Due to mapping discrepancies 1,340 lights were changed. The reduction in 70 lights means that the actual energy efficiency improvement from the project will be 378,030 kWh per year or over 400 tonnes of carbon dioxide equivalent in greenhouse gas emissions.

The reduction of 378,030 kWh per year will equate to a saving of approximately $70,000 per year and up to $3.5 million over the life of the lights (15 years).

See *Attachment 33 (Energy Efficiency Improvement and Cost Benefit)* for a more detailed analysis of the energy and cost savings including methodology used.
The first four months of actual billing data (as detailed in the below graph) has shown significant cost savings and correlates with estimated savings for the overall project.

![Graph showing Green Street Lighting Project Savings First 4 months after installation]

**Community and Other Benefits**

The T5 efficient fixture used for the South Gippsland Green Street Lighting project are a significant improvement on the old 80 Watt Mercury vapour in terms of community benefits. Benefits include a decrease in glare, more evenness of light spread, reduced upward spill of light and reduced mercury content. The lights are also manufactured and owned by Australian companies, so the project supports local industry.

Prior to the preparation of the project plan, a workshop was held with relevant internal staff to go over any areas of particular concern in the community that could be associated with lighting (such as high traffic accident prone areas). No areas were identified that needed higher than standard lighting, but this was an option if an issue was raised.

As evidenced in the Communications Activity table in this report a vast amount of promotional work was undertaken throughout the life of the Green Street Lighting project. Community interest in the project was high with all press releases being picked up by the local papers (reaching approximately 20% of the population) and a request for a television interview on a local news program (the population of South Gippsland Shire is 27,500 according to the last Census and a large majority of the population watch local television channels). Communicating the benefits of such an energy efficiency project illustrates the importance of saving energy and reducing greenhouse gas emissions to the community.

As a result of the Green Street Lighting Project, South Gippsland Shire Council is now seen as a leader across Gippsland in the area of bulk street lighting upgrade projects. South Gippsland was one of two Councils in Gippsland to receive grant funding under Round 1 of the Australian Government’s Community Energy Efficiency Program and carry through with project implementation. As a result the project team has been asked to present and speak at network meetings about the project not only across Gippsland but at State wide conferences as well via the
Municipal Association of Victoria. All Councils across Gippsland have now either started or are about to start similar bulk upgrades to their street lighting networks and this can partly be attributed to the leadership shown by South Gippsland Shire Council.

SP Ausnet are the Electricity Distribution Business right across Gippsland and hence all other Gippsland Shires now undertaking street light bulk upgrade projects will need to work in partnership with SP Ausnet. As South Gippsland Shire have already demonstrated the benefits of energy efficient upgrades to SP Ausnet, the experience, lessons learnt and the relationships built will benefit other Council’s in the area and should make the process much smoother for both Councils and SP Ausnet.

The Green Street Lighting project has assisted the Sustainability team to be seen as a leader within our organisation and has led to stronger relationships with other teams within Council. The successful implementation of the Green Street Lighting project and the subsequent cost savings has led Council to approve a revolving Sustainability Fund of $20,000 per year to be used for further energy efficiency projects in Council owned facilities.

**Budget**

The Green Street Lighting project was achieved under the projected budget. Original total project costs were estimated to be $606,821 with $172,812 (approximately 30%) being contributed by the Australian Government. At the conclusion of the project the total project costs were $534,221, resulting in a saving of $72,600.

**Budget Changes**

The original project scope included upgrading all old style standard street lights on local roads across the Shire. Due to mapping discrepancies (as detailed in the overcoming issues and lessons learnt section above) there were 1,260 of these lights as opposed to the original estimate of 1,410 which resulted in a reduction in associated costs. Some of the project savings were used to extend the project scope to include the upgrade of 80 of the more expensive style decorative lights on Council local roads.

When originally presenting the project to Council for approval, total costs were estimated to be between $521,060 and $606,821. The higher end of the scale was budgeted for with Council’s contribution estimated at $434,009. With the reduction in project costs Council was able to opt for a better case scenario and contribute $344,010 to the project (excluding in-kind support as detailed below).

The project item which resulted in the highest cost savings for the project was for the supply and installation of the lights. Original estimates put the cost per light (for supply and installation) at $320 but actual costs were $281 per light. The savings here can be attributed to taking advantage of economies of scale. Economy of scale was achieved by participating in the Municipal Association of Victoria’s public lighting hardware panel for the purchase of the lights and by partnering with neighbouring Council, Bass Coast Shire for the installation of the lights and the technical advice and project management of the installation.

The below tables summarise the difference between estimated and actual costs by project item. Please see full budget workings as *Attachment 34 - Green Street Lighting Project Budget.*
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Estimate</th>
<th>Actual spent</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project costs from DNSP</td>
<td>Non-contestable project management costs and written down value</td>
<td>$80,780</td>
<td>$70,749</td>
<td>-$10,031</td>
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<tr>
<td>Supply and installation costs</td>
<td></td>
<td>$451,200</td>
<td>$376,934</td>
<td>-$74,266</td>
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<tr>
<td>Project management and</td>
<td></td>
<td>$48,165</td>
<td>$63,655</td>
<td>$15,490</td>
</tr>
<tr>
<td>consultation costs</td>
<td>Manage the project, write reports, prepare community consultation materials,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>attend meetings and manage grant funding.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Council administrative costs</td>
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<td>$26,676</td>
<td>$22,883</td>
<td>-$3,793</td>
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<tr>
<td>Ongoing maintenance provision</td>
<td>Reverts to DNSP</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Project Cost</td>
<td></td>
<td>$606,821</td>
<td>$534,221</td>
<td>-$72,600</td>
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</tbody>
</table>

### Budget Summary

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEEP cash contribution</td>
<td>$172,812</td>
</tr>
<tr>
<td>Council cash contribution</td>
<td>$344,010</td>
</tr>
<tr>
<td>Council in-kind contribution</td>
<td>$20,748</td>
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<td>Council total contribution</td>
<td>$364,758</td>
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<tr>
<td>Total available budget - cash</td>
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<tr>
<td>Total spent - cash</td>
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<tr>
<td>Budget left - cash</td>
<td>$3,349</td>
</tr>
<tr>
<td>Total project original estimation</td>
<td>$606,821</td>
</tr>
<tr>
<td>Total project actual spent (inc in-kind)</td>
<td>$534,221</td>
</tr>
<tr>
<td>Difference between estimation and actual</td>
<td>-$72,601</td>
</tr>
</tbody>
</table>

An external audit of expenditure for the 2013/14 financial year was undertaken in accordance with clause 8.2 of the funding agreement. The auditor’s report can be found as Attachment 35.
Council In-Kind Support

Council's in-kind support was provided via officer time in project management work associated with the Green Street Lighting Project. The support provided is equivalent to $20,748 which was calculated based on half a day per week work at $35 per hour for two years.

Project operation, mechanisms and processes

MAV Procurement

Victorian Councils have been investigating the options for bulk upgrades to the street lighting network for the last ten years or so given the high cost and greenhouse savings potential of an upgrade to more efficient technologies. The first bulk upgrade projects started occurring for Councils in Victoria in around 2008. Since then processes have become more streamlined and affordable but given the many stakeholders involved in the process, can still be complicated. Given the technical complications involved, the Municipal Association of Victoria decided to go through a tendering process for the supply of hardware and project management (including the procurement of installation contractors) for street lighting projects. Councils who signed up to this process could utilise the hardware panel and professional project managers for their projects without individually needing to go out to tender for these services. See Attachment 36 for a presentation organised by the MAV in June 2012 covering the procurement options for Councils looking at street lighting upgrade projects.

Three Councils in Gippsland received Australian Government grant funding for street lighting upgrade projects (South Gippsland, Bass Coast and Baw Baw Shire Councils). A meeting between these three Councils, the MAV and Ironbark Sustainability (the consultants who were awarded the project management tender through the MAV procurement process) was organised and a quote was put together by the MAV to manage the project. Costs per Council as well as a cost if more than one Council accepted the quote were provided. See the quote document provided as Attachment 37. South Gippsland and Bass Coast Shire Councils accepted the quote. See Attachment 38 for a letter from the CEO of South Gippsland Shire Council accepting the MAV quote.

This process was very successful. The ability to access the MAV lighting hardware panel for the different stages of the project meant that purchases could be made without needing to go through a lengthy tender process and also guaranteed that we were purchasing technologies approved for use on the distribution network.

Utilising the expertise of the MAV and Ironbark Sustainability to coordinate the procurement of the installation work for the project proved to be a significant time saver and resulted in a fantastic outcome and savings for the project.

Project management consultants, Ironbark Sustainability were invaluable to the whole process. Without their technical expertise, contacts and professional advice Council would not have had the internal resources to manage the bulk upgrade project. Their constant communication and updates throughout the project meant that everything ran smoothly even in the case of unexpected delays.
Economies of Scale

Being able to utilise economies of scale by partnering with Bass Coast Shire Council resulted in significant cost savings for the project as outlined in the Budget section of this report. Economies of scale were utilised for each aspect of the project – management, hardware and installation purchases. This project has strengthened the relationship between South Gippsland and Bass Coast Shire Councils and has led to further collaboration via the CEEP Round 2 grants project.

Internal Resources and Lessons

A number of Councils upgrading their street lights have been interested in installing LED technology. As detailed in this report only the T5 and the CFL lights were approved for use on the SP Ausnet network during the timeframe of the South Gippsland Green Street Lighting project. LEDs have since been included in the approved list and a number of Council’s in Gippsland are now looking at installing the LEDs as part of their upgrade projects. Given the hype around LEDs and the fact that they are a new technology led to many internal questions about why South Gippsland were not installing LEDs. Officer time was required a number of times through the process to remind different staff members and Councillors of the reason for not installing LEDs (they were not an option for us). Confusion was sometimes introduced by different companies selling LED lights who inferred that LEDs could be installed on the distribution network. This was false information. They had been approved on some networks in Victoria, but not for the SP Ausnet area. In the time period of South Gippsland undertaking the street lighting bulk upgrade project there has been a number of questions raised by Local Government in Victoria about the contestability of the lighting network. The distribution business’ own the lighting network and infrastructure, but Council pay for the electricity and maintenance for the lights. Purchasing the electricity for the use of the lights is contestable and Councils are free to contract with an electricity retailer of their choice via approved tendering processes. The maintenance of the lights has not been seen as contestable in the past but some Councils have started to question this process. No Victorian Council has yet successfully started externally tendering for maintenance of street lights, but the question has been raised and process started for change. This resulted in some confusion as there were some companies who were competing for the maintenance of lights who communicated to Councils that they should hold off on bulk upgrade projects until they could also go through a maintenance tendering process at the same time. Once again this resulted in additional Council officer time to explain the process to internal staff and Councillors. Firm guidance to Councils from the AER around this issue would have been beneficial.

As part of the process Council has gained a greater understanding of its street lighting network. Before procurement of the project could take place Council was required to define its lighting requirements by assessing current lighting and identifying any possible problem areas (such as areas of high traffic accident incidence areas that have had complaints about being over or under lit). This information was then used to compile a final design and specification in readiness for the procurement process. This final design will assist Council to make any future changes to the lighting network (both SP Ausnet and Council owned) more sustainable.
Conclusion

The Green Street Lighting project successfully saw the upgrade of 1,340 street lights with more efficient globes. This will result in a reduction in electricity use of 378,030 kWh per year which equates to over 400 tonnes of annual greenhouse gas emissions. The upgrade will save Council approximately $70,000 in the first year and up to $3.5 million over the life of the lights (15 years).

South Gippsland Shire is now seen as a leader in the area of street lighting upgrade projects across Gippsland and has demonstrated the importance of energy efficiency and greenhouse gas emission reductions to the local community.

The partnerships and relationships built as a result of the Green Street Lighting project will continue into the future and hopefully result in further reductions to councils and the community's energy use and greenhouse gas emissions.
Declaration

The Authorised Officer of the organisation makes the following declarations:

☒ I declare that I am authorised to submit this Final Report (including any attachments) on behalf of South Gippsland Shire Council ........... (Name of organisation)

☒ I declare that the information provided in this Final Report is true and accurate.

☒ I understand, and acknowledge that giving false or misleading information in this Final Report is an offence under the Criminal Code Act 1995.

☒ I understand that final payment will only be made in accordance with the Funding Agreement including on satisfactory completion of Milestones.

Authorised Officer Signature: ................................................. Date: .............. 5.9.2014

Name: ....................... .................................................

Position: MANAGEMENT SUSTAINABILITY Organisation: .................................................

Witness Signature: ................................................. Date: .............. 5.9.2014

Name: ....................... .................................................

Position: SUSTAINABILITY OFFICER Organisation: .................................................

The use and disclosure of information provided in this Final Report is regulated by the relevant provisions and penalties of the Public Service Act 1999, the Privacy Act 1988, the Freedom of Information Act 1982, the Crimes Act 1914 and the general laws of the Commonwealth of Australia.

Information contained in the Final Report may be disclosed by the Department for purposes such as promoting the program and reporting on its operation and policy development. This information may also be used in answering questions in Parliament and its committees. In addition, the selected project information will be made publicly available. Public announcements may include the name of the grant recipient and of any project partners; title and description of the project and its outcomes; and amount of funding awarded.
### Project Title

**South Gippsland Shire Green Street Lighting Project**

### Project ID

CEEP1070

### Funding Recipient

South Gippsland Shire Council

### Date

September 2014

<table>
<thead>
<tr>
<th>Building, Facility or Site 1</th>
<th></th>
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<tbody>
<tr>
<td>Name of Building, Facility or Site 1</td>
<td>Street Lights</td>
</tr>
<tr>
<td>Location (address)</td>
<td>Na – street lights</td>
</tr>
<tr>
<td>Type of building, facility or site</td>
<td>Na – street lights</td>
</tr>
<tr>
<td>Activity Type and Measure</td>
<td>Street lighting replacement</td>
</tr>
<tr>
<td>Energy Efficiency Estimate Method</td>
<td>Figures are based on real street light data – bills and number of lights. As there is essentially one technology change (80W to 28-32W lights) it is very simple to determine savings.</td>
</tr>
</tbody>
</table>

Baseline 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:
| **Baseline Energy Efficiency** | 1340 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 11.94 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).  
The result is **560,042 kWh per annum**. |
|-------------------------------|--------------------------------------------------------------------------------|
| **Energy Efficiency Improvement** | Council's lighting stock primarily comprise standard 80 Watt mercury Vapour lights (80W MV), which uses around 60-70% more energy than more efficient technologies that are currently available and approved:  
KMs of roads that are P category: 1875 km  
Number of P lights: 1594  
Energy consumption: 560,042 (see above)  
Energy consumption per KM of road per year: 299  
Energy consumption per KM of road per day: 0.819  
Note this project only refers to P category roads. |
| **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 are:  
1260 x 2x14W “T5s” (wattage 30.2w)  
80 x 42W CFLs (wattage 46.4w)  
To calculate new energy use the calculation is:  
Number of Lights x Wattage x 365 (days/year) x 11.94 (hours operational per day based on the regulations cited above) / 1000 (to get to kWh).  
The new energy use is 182,012 kWh per year.  
This project has saved **378,030 kWh per year** (560,042 kWh -182,012 kWh) which amounts to a saving of 68%. |
| **Reporting Data (Measuring Energy Efficiency and Additional Data)** | Council has a total of 2,527kms of roads of which 1875 are P category roads.  
Average hours of operation of lights per day: 11.94 hours  
Percentage of the day lights are operational 49.8%  
**Assumptions**  
• Energy price increases are a choice of a conservative
approach used by the Federal treasury (using CPRS 15%), a pessimistic approach used by the Energy Users Association of Australia (from 2010-2020 and then using the Treasury modeling from then on) and the average of the two. These choices were made after consulting the authors of the Treasury modeling (who are also members of the EUAA) and realising that either of the two models are possible outcomes so by providing the option of either with a mid point it will enable Councils to assess a variety of possible outcomes.

The sources of information are as follows:

- **Electricity prices for street lighting are modeled to increase from 10.4 cents/kWh in 2010**
- **OMR prices are for 2011 as stipulated in the October 2010 AER documents, plus $3 for all lights with electronic control gear (as this cost has been excluded from the OMR price but is a real cost that needs to be factored in);**
- **All savings and cost figures are GST Exclusive;**
- **Operating hours of lights are 11.94 hrs per day in Vic**
- **Emission factor is 1.37kg Co2-e per K Wh**

<table>
<thead>
<tr>
<th></th>
<th>Treasury Base</th>
<th>Treasury CPRS 5%</th>
<th>Treasury CPRS 15%</th>
<th>EUAA modeling</th>
<th>Average (Treasury modeling) (Base Case + CPRS 15%) and EUAA/2</th>
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<tbody>
<tr>
<td>Base to 2050</td>
<td>63%</td>
<td>62%</td>
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<tr>
<td>2010-2020</td>
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<tr>
<td>2020-2030</td>
<td>16%</td>
<td>64%</td>
<td>72%</td>
<td>88%</td>
<td>80%</td>
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</table>


- **Cost of Activity** $606,821
- **Estimated Cost Savings** $70,000 per year. With estimated $3.5 million over the serviceable life of the lights (15 years)