

SOUTHERN GATEWAY TOURIST VISITOR CENTRE (SGTVC)

Lighting Upgrade

Case Study



Précis:

Wollongong City Council is actively taking steps to protect our natural environment, reduce the use of natural resources and support a high quality of life for present and future generations. In achieving these goals, it also endeavours to reduce its operational footprint. A strategy currently being implemented is to steadily improve the overall operational efficiency of assets.

Council received community concerns about the level of external lighting of the SGTVC resulting in further investigations and the site being nominated as a project that could help Council reduce its footprint by upgrading the lighting to achieve energy efficient savings and at the same time addressing the community concerns.

Wollongong City Council in partnership with the Department of Climate Change and Energy Efficiency provided the necessary funding to facilitate the upgrade works.

These works included the replacement of 162 existing luminaires totalling 18,043 Watts with 154 luminaires totalling 6,791 Watts. This substantial reduction is due mainly to better technologies of current luminaires, including LED technology.

The reduction in energy achieved was 45,025 kWh per annum or an annual consumption saving of \$6,303 excluding maintenance financial benefits.

Outline of Project

Background:

The key objectives of this project were to benefit the environment by having a reduced carbon footprint, reducing the glare and over lighting of the site and obtaining energy savings providing economic benefits to the Council and community.

A lighting audit was undertaken on the SGTVC to provide short and long-term strategies to reduce the glare concerns and the unnecessary lighting consumption. From this audit, an industry-leading consultant was engaged to provide design documentation to address the key objectives of the project.

An energy efficient lighting scheme was developed with calculated energy savings of 64% to be achieved.

Implementation:

The lighting audit concluded that the site is substantially over lit noting 'spill light emanating from the SGTVC creates an aura over the facility by illuminating low level clouds which can be seen miles away'.

The proposed replacement energy efficient lighting scheme addressed issues including:-

- Glare (in particular the car park);
- Safety and Security;
- Energy Reduction;
- Maintenance Issues.

Strategies to address these issues included Energy Conservation Measures (ECM's) such as:

- Replacing existing lighting systems with more efficient luminaires which enable a reduction in unnecessary energy consumption with little compromise to original lighting design concepts;
- The use of energy efficient LED (Light Emitting Diode) lamps lasting up to 7.5 times more than fluorescent lamps;
- Redesigning lighting to specific areas removing luminaires responsible for sky pollution, glare issues as well as reducing energy costs;
- Ultrasonic/Infrared sensors installations to control lights more effectively for security CCTV monitoring as well as achieving long-term savings;
- Modify existing light switching arrangements to achieve optimum energy savings.

Council was successful in an application for co-funding through a Community Energy Efficiency Program and committed to upgrading the current lighting scheme.

Council engaged the services of NSW Public Works and a local electrical contractor to facilitate the delivery of the project.

Challenges:

The key challenges of the project are summarised as follows:

- Compliance with the funding agreement in regards to the reporting and time frame requirements;
- Local Government Regulations, procurement policy compliance;
- Works being carried out on an occupied site;
- Completion within budget;
- Achieving the Energy Efficiency savings.

Monitoring and Evaluation:

Evaluation of the project outcomes was carried out with energy data loggers connected to the electricity systems monitoring the consumption of energy over a period of time. The design consultant carried out calculations and comparisons of the pre and post activity data. From this data, it was calculated that the actual savings achieved were 62% against the initial estimate of 64%.

Outcomes:

The Lighting project yielded consumption savings of 45,025 kWh resulting in the abatement of 48 tonnes of CO₂-e and yearly financial savings of \$6,303 using a low rate of 14c per kWh for the energy consumption.

Actual savings associated with the project are understated, as they do not include the savings associated with the reduced maintenance and replacement frequency of the luminaires and globes, or current electricity pricing. These additional annual savings have been calculated at \$4,359 for material maintenance costs and \$4,000 for the applicable labour component. Therefore, an additional \$8,359 per annum of savings will be achieved.

The total capital cost for the project was \$210,000 including all project phases such as initiation, development, implementation and finalisation including project reporting.

The total return on investment has been calculated at \$14,662 per annum. Taking into account these savings the payback period is anticipated to be 14 years not including the actual cost benefit Council received due to the project being co-funded.

Additional to the above savings, further savings were achieved by the installation of a day light sensor and motion detectors for the lighting located underneath the rear of the centre (11 double fluorescent 28Watt T5 fittings). These works were not included as part of the original contract but issued as a variation towards the end of the project. In total an estimated additional 2,657kWh or \$372 per annum of savings will be achieved.