Embracing energy efficiency at Lismore City Council

COUNCIL NAME
Lismore City Council

WEB ADDRESS
www.lismore.nsw.gov.au

SIZE
1290 square kilometres

POPULATION
44,000

Overview

Lismore City Council (LCC) undertook energy efficiency upgrades at two council owned sites using three technologies, LED lighting, Steril-Aire ultra-violet light emitters for the air conditioning system and exterior heat reflective paint. The project was funded through an Australia Government grant and matched with Council's internal revolving loan fund. The energy efficiency initiatives have reduced the combined electricity consumption at the two sites by 362,977 kWh annually which is saving Council $19,544 per year on electricity costs, and has reduced council's greenhouse gas emissions by 70 CO_2e tonnes per year.

Lismore City Council Corporate Centre after heat reflective paint application on roof and exterior walls.

Background

LCC has been working towards energy efficiency and reducing greenhouse gas emissions (GHG) for over a decade. The first solar photovoltaic systems were installed on Council buildings in 2009, lighting retrofits commenced in 2010, as well as a review of the vehicle fleet to reduce fuel consumption. This led to the extraordinary achievement of curbing councils six year strong emissions growth trend which continued on to set a downward trend. Emissions were reduced by 4% in just one year by the end of the 2011 financial year.

This case study project involved energy efficiency upgrades at two council sites, the Council Corporate Centre and a small Council-owned CBD building. The project sites are in the Council's top 20 energy-consuming properties. The energy efficiency measures included LED lighting retrofits, retrofitting UV-C filters to existing heating, venting and air conditioning (HVAC) units, as well as trialling the emerging technology of heat reflective paint.

The project also stablished a partnership with the Lismore Community Sustainability Forum (LCSF) to deliver energy efficiency literacy and education to low-income residents with the aim of increasing uptake of energy efficiency initiatives.

LOCAL GOVERNMENT NSW

REFERENCES

Powersmart Energy Efficiency Report
www.power-smart.com.au
powersmart@netspace.net.au

Implementation

Council engaged a consultant to conduct energy audits at the two sites. The audits identified that the Corporate Centre HVAC system accounted for 67% of all energy use, with lighting being the next largest energy user at 13.6%. The air conditioning system at the CBD office accounted for 48% of the electricity consumption. Based on the audit report recommendations the following measures were implemented.

Site 1: Lismore City Council Corporate Centre

- Retrofitted UV-C filters (an ultra-violet treatment system) to the existing ducted HVAC system on the supply side of conditioned air to reduce bacteria build up on coils and inside the ducts. This extends ongoing maintenance cycles, reduces airflow constrictions and provides cleaner and bacteriologically safer air.
- Applied heat reflective paint to the building roof and exterior walls to reduce heat build-up.
- Retrofitted all compact fluorescent internal and external lights with LEDs.

Site 2: Lismore City Council CBD Building

- Replaced the existing air conditioning systems with inverter type split system air-conditioning units.

The project required interdepartmental collaboration between the Environmental Strategies section, Asset Management and Finance. The internal project team liaised with the energy consultants including the energy auditor and several specialist contractors.

Outcomes

Lismore City Council Corporate Centre

- A reduction in electricity consumption of 350,566 kWh or a 16% annually.
- Cost savings of $16,000 per year.
- Reduction in GHG emission of 59 CO_2e per year.
- Non-quantifiable staff health benefits of the improved air quality as a result of the implementation of the Steril-Aire emitters to the HVAC system.

Lismore City Council CBD Building

- A reduction in electricity consumption of 12,411 kWh or 48% annually.
- Cost savings of $3,552 per year.
- Reduction in GHG emissions of 10.2 CO_2e tonnes per year.

Key Learnings

Key lessons for other councils undertaking similar upgrades are:

- Post-retrofit audits are extremely valuable in verifying outcomes. This process has provided LCC with a detailed assessment and analysis of all measures, with verification of the measures that delivered the anticipated outcomes, and identification of the measures which fell short of expectations.
- Power monitoring and data logging has proven to be an essential tool for selecting retrofit technologies and to monitor the results. It has also become less costly to conduct long-term power monitoring thanks to a new generation of more affordable power monitors. At the same time energy retailers provide better web interfaces that allow viewing site or meter based load profiles, kVA demand, power factor and load factor in real time or as historical data. Had this technology and data been available pre-retrofit it would have delivered valuable insights into the baseline data, as well as more accurate verification of the project after implementation of the retrofits.
- A pre-trial and monitoring of the UV emitters had been carried out prior to the site-wide installation which showed the advertised improvements in higher air flow and lower power

consumption. The post-retrofit results so far are encouraging and may come in as expected or even better.

- The post-retrofit audit of the heat reflective paint failed to show a significant (5% or better) impact of this technology on air-conditioning related power consumption. The chosen site was not the ideal candidate for this technology, i.e. non air-conditioned warehouses, sheds, workshops and large industrial buildings.
- Lighting retrofits have proven to be a reliable way to reduce energy costs with predictable energy and cost savings. For this project there is a high correlation between anticipated and realised outcomes.
- A collaborative approach across council departments is essential to ensure that any changes to the project including technology advancement, infrastructure changes, and time delays are identified early to allow for re-calculation of the cost/benefit analysis and the pay-back period.

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