

MEASUREMENT & Verification

CASE STUDY: Lighting trials means lights on at Australia Post

M&V confirms results of lighting trial, saving energy and dollars.

The Project

Australia Post owns or leases around 1,200 facilities nationwide, including retail outlets, mail processing centres and offices. These facilities account for approximately two thirds of Australia Post's greenhouse gas (ghg) emissions, with the large mail processing centres consuming the most energy.

Consequently, Australia Post identified that the large facilities present an outstanding opportunity to implement energy efficiency, save money, engage staff and reduce ghg emissions. To capitalise on this opportunity, Australia Post undertook energy audits of these larger facilities. The audits found, on average, lighting accounted for 40% of total energy use at a site.

The management of the facilities is undertaken by Australia Post's corporate real estate (CRE) group. CRE undertook to conduct testing of new



Dandenong Letter Centre with upgraded lights.

lamp technology to determine which lighting solution would be the most energy efficient while providing the same quality of lighting.

The Dandenong Letter Centre (DLC) was selected as the test base for the high bay and car park lighting. The DLC is a warehouse-style building with mail processing equipment, operated 24 hrs per day, 6 days a week. It was proposed to swap out the 200 / 300 watt metal halide high bay lamps, and 150 watt metal halide car park lamps, and trial induction and LED lights. As other factors such as lighting quality, compatibility with the current BMS, maintenance issues and reliability were important, a number of different lights were trialed.

The lights trialed in the high bay were:

- 100 watt digital LED light disc
- 100 watt traditional LED lights
- LSI induction lamps

M&V in the overview

M&V Option A was used to confirm the energy savings from the project. Data logging of the lighting circuits was conducted over a six week period. The testing results clearly showed that by the total replacement of the old technology metal halide high bay lamps to the new technology - LSI induction high bay lamps - there would be up to a 40% reduction in lighting energy consumption, which will save in the order of \$1.2 million dollars over 3 years at DLC alone.

Costs saved / yr: \$405,000

Energy saved / yr: 7,200 GJ

GHG saved / yr: 2,500 t CO₂-e

Payback (yrs): 4

M&V methodology: Option A

The trial found that both the LED and induction lamps were more energy efficient and had less heat output than metal halide lamps. Of these two options the induction lamps were preferred as they are compatible with the BMS and can be turned on and off without impact, and the feedback regarding the quality of light and light disbursement was positive. The induction lamps were also more cost effective. They demonstrated a 60 per cent reduction in electricity use and have six times the life span of the metal halide units thereby reducing maintenance costs.

The success of the trial meant that a successful business case was raised to replace the lights. In 2010 the lights at the DLC were replaced, and Australia Post is planning to progressively install the high bay induction lamps throughout their major processing facilities and have recommended that these lamps be included in new building projects.



One of the replacement lights used in the High Bay area.

M&V Methodology in detail

M&V Option A – Retrofit Isolation: Key Parameter measurement - was used to confirm the energy savings from this project.

The measurement of the energy used for lighting at the DLC was completed with a data logger. The data logger was set up to monitor the energy use of the lighting circuits before any changes were made. It was a simple operation to hook up the data logger to the lighting circuit, and the measurements were recorded for 2 weeks before the lights were changed. This set the baseline energy consumption.

The operating hours of the Letter Centre, and hence the lights, remained constant throughout the trials so this was not measured, just recorded as 24 hrs a day, 6 days a week. The lights were changed and the lighting circuits were monitored for four weeks. This set the post-retrofit energy consumption.



DLC Operations area with the energy efficient lighting

The baseline energy consumption and the post-retrofit energy consumption, along with the recorded hours of operation provided the information to calculate the energy and dollar savings.

Benefits of M&V for this project

M&V was critical to prove that a lighting change would result in significant energy and cost savings. The information obtained from the trial enabled the business case to be developed for the replacement of lights at the DLC. The transparent measurement and collection of data resulted in 'buy-in' from the site manager and the senior managers, convincing them of the benefits of replacing the lights.

The installation of more efficient lighting will save Australia Post in excess of \$1.2 million over 3 years at DLC alone. The roll out of more efficient lighting throughout Australia Post's letter and parcel centres will increase the savings considerably.

The Parties involved and why they made the M&V decisions they did

As the project manager of the lighting trial said with regards to the measurement "it is all common sense. You have to measure before you make a change, ensure you only make one change, and then measure the impact of that one change". By following IPMVP the trial proved that energy and money could be saved by replacing the lights, with no reduction in lighting quality.

Courtesy of Australia Post

Courtesy of Australia Post