

Council's energy efficiency upgrades benefit community



Project Snapshot

Objective: reduce energy, save money & improve comfort in public buildings

Where: Meander Valley Council, Northern Tasmania

Total cost: \$226,000

No. of buildings: 3

Energy reduced: 27%*

Emissions reduced: 62 T CO₂-e/pa*

Financial savings: \$16,500 pa*

Payback: 13.7yrs*

*Not a full year since upgrades were installed

Background & Opportunity

Meander Valley Council received \$151,000 from the Australian Government's Community Energy Efficiency Program (CEEP) towards its \$226,000 building energy efficiency project.

The energy upgrades are saving Council money and improving comfort for users of 3 Council-owned buildings.

The 3 buildings selected; Council's Offices, Westbury; the Great Western Visitors Centre, Deloraine; and the Deloraine Community Complex consume 85% of the total energy of Council-owned buildings.

The work was completed over 10 months and included the installation of energy reduction measures – such as improvements to heating, hot water, insulation, draft proofing, lighting and more. Local contractors and businesses benefited from the project.

Changes in energy use patterns have been assessed using 2 years of historic energy data, onsite energy audits before and after the upgrades, as well as real time energy monitoring.

The project outcomes have been shared with local residents to help them identify simple ways to save money and improve comfort in their homes and businesses.

An 'efficiency fund' will be established to use savings on future efficiency upgrades and achieve even more savings; creating an ongoing benefit to Council and community.

Buildings – Measures & Savings

Deloraine Community Complex

Overall energy reduction 37.2% - saving 33,811 kWh or ~\$8,000 pa*

- Stadium lighting - LEDs
- Lighting upgraded throughout
- Air re-circulation system in Auditorium
- Hot water – continuous flow gas and solar
- Turned off hot water re-circulation pump
- Low flow showerheads

Deloraine Visitor Centre

Overall energy reduction 32.8% - saving 22,228 kWh or ~\$5,000 pa*

- Lighting upgraded throughout
- Zoning, draught proofing
- Insulation
- Solar hot water
- Heat transfer system, entry air curtains
- Low wattage personal heaters
- Window films

Westbury Offices

Overall energy reduction 11.7% - saving 15,378 kWh or ~\$3,500 pa*

- Lighting upgraded throughout
- Insulation
- Draught proofing
- Solar hot water
- Low flow showerheads
- Heat transfer system, entry air curtains
- Low wattage personal heaters
- Window films

** Not a full year since upgrades*

Energy assessment

Harkness Consulting completed an energy audit at the start of the project in January 2013 to establish baseline energy usage and recommended actions that would save the most energy and maximise Council's return on investment. After the energy efficiency measures were implemented, Harkness Consulting conducted a comparative audit to measure the impact of the upgrades.

Energy monitoring

Greensense View is the energy performance monitoring software that helps Council track energy consumption in real time. The dashboard shows the energy use in 1 or more of the

buildings based on interval data provided daily from Council’s energy meter data provider ERM; refer Figure 1. Greensense also uploaded 2 years of historical data, to provide a more accurate energy baseline to compare against energy savings.



Figure 1: The screenshot above reveals the electricity usage for the 3 buildings, over a 24 hour period; the weather; a tip for saving money; and a comparison of the current years energy use to the previous year.

Lighting

Around 810 lights have been replaced with Light Emitting Diodes (LEDs). Though energy and financial savings were the primary focus, the greatest benefit for users is the superior quality light and uniformity. Of all the lighting replacements the standout has been removing 440W mercury halide high bay lights in the sports stadium and replacing them with 147W dimmable LEDs; refer Figure 2.



Figure 2: The image above show the contrast between the old mercury halide high bays at the front and the replacement LED lights at the rear.

Draft proofing & insulation

External doors were draft proofed and insulation added to ceilings, under floors, and walls. Due to the age and construction of the buildings there were a number of roof spaces where insulation could not be installed. The measure that gained the most attention was the addition of colour matched, thermal panels below windows in the glazed corridors of the Westbury Office, where extreme temperature variations have been eliminated; refer Figure 3.

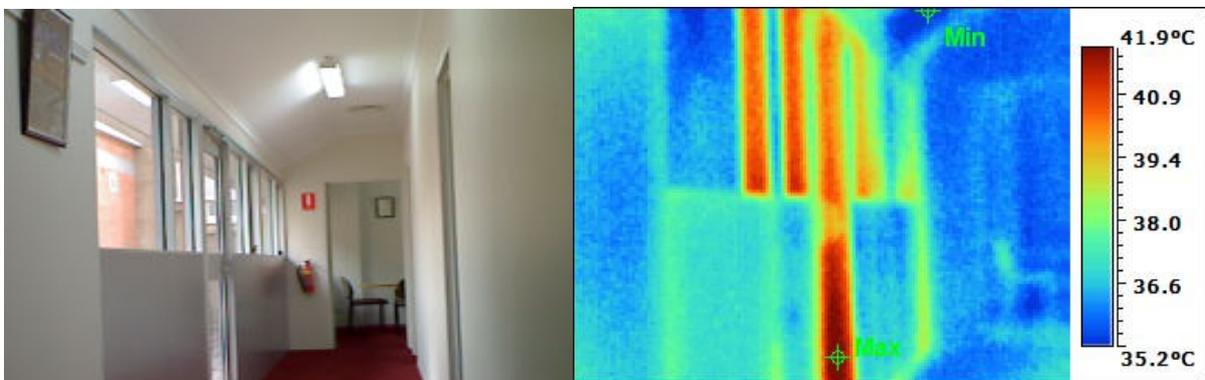


Figure 3: The images above show the temperature difference between. The image on the left shows the insulated panels and glass in a glazed corridor, which when viewed using a

thermal imaging camera as shown on the right reveals a 2 to 3 degrees Celsius temperature difference between windows (without film) and the insulated panels.

Windows

Enerlogic window films were installed at 2 of the sites to improve the thermal performance of the glass; refer Figure 4. The films proved to be the only viable option, as double glazing was too expensive and secondary glazing – with Perspex to create an air cavity – unmanageable given the variety of window frame types.

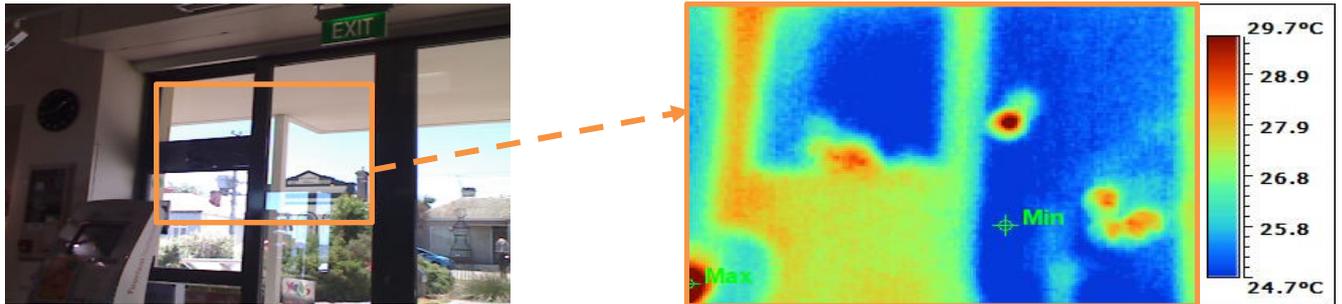


Figure 4: The image on the left shows the lower left window pane without film, which when viewed using a thermal imaging camera as shown on the right reveals a 2 to 3 degrees Celsius temperature difference between windows with film and the window without (lower left window).

Heating

The heating, ventilation and air conditioning (HVAC) systems were not altered at any of the sites due to financial constraints. Instead upgrades focused on the movement of air into, out of and within the buildings. Measures included air curtain into foyers to reduce the transfer of air at the main entries, as well as Airpear redistribution systems and ducted heating systems to recover heat for redirection to where it is needed; e.g. out of computer server rooms to cool servers, reduce the load on reverse cycle air conditioners and warm adjacent corridors.

Hot water systems

The hot water systems at all facilities are used irregularly. Electric hot water tanks were replaced to reduce the losses from storing hot water. 4 x 160L electric systems were replaced with a mix of solar plate and evacuated tube hot water systems. 2 instantaneous gas systems were installed where solar access was not possible. The remaining 2 x 160L tanks were replaced with smaller 50L electric tanks with timers where low water volumes are required. To further reduce energy losses, all pipes and fittings were lagged and timers installed.

Conclusion

The CEEP project has vastly improved the amenity of the upgraded buildings, benefiting people who use them on a daily basis. It has resulted in significant long term reduction of costs to Council. At the start of the project the aim was to reduce energy by 44%, emissions by 170T, costs by \$28,000 per annum and provide a return on investment of less than 8 years. Though these aims have not been achieved yet, the desired outcomes are expected to be realised once the energy upgrades have had a full year to influence energy use and in particular reduce winter costs.

Contact

To find out more about the project contact Craig Plaisted, Project Officer for Meander Valley Council on 6393 5324, 0457 412 610 or email craig.plaisted@mvc.tas.gov.au.



Australian Government
Department of Industry and Science

The views expressed herein are not necessarily the views of the Commonwealth of Australia and the Commonwealth does not accept any responsibility for any information or advice contained herein.