

Diocesan Facilities in the ACT take on major Projects to improve Energy Efficiency

Environmentally responsible behaviour not only leads to a warm glow of moral virtue, it can save you money!

Introduction

The Environment Commission has been the sponsor of a large project to upgrade the energy performance of premises operated by the Diocese. The project was to identify investment opportunities where both cost savings and environmental benefits could be achieved by more efficient energy management.

Moreover, the project has been structured as a partnership with energy contractors ActewAGL to guarantee the costs financial savings in the event that the energy savings have not been realised.

We wish to acknowledge the generous financial and technical support provided by the ACT Government in facilitating the partnership, and ActewAGL for their support and assistance in the completion of the agreements with individual facilities.

Energy conservation measures (ECMs) were identified at the eight nominated sites, namely:

- Canberra Grammar
- Canberra Girls' Grammar
- Canberra Girls' Grammar Junior
- Radford College
- Brindabella Gardens Nursing Home
- Gininderra Gardens Retirement Village
- Jamieson House
- St Marks Theological College

The Energy Performance Contract will lead to:

- a minimum electricity reduction of 350,000kWh per year,
- a minimum gas reduction of 900 GJ per year,
- reductions in energy related greenhouse gas emissions of 400 tonnes of CO₂ per annum, and
- reductions of over \$78,000 in annual energy and maintenance bills.

The internal rate of return of the proposed EPC project is 15.00% (over 15 years) based on a capital investment of \$430,000. That is, a payback time of 7 years on the investment, as well as the substantial environmental gains. This represents a superior rate of return on investment to that achievable through usual business investments.

DESCRIPTION OF ENERGY CONSERVATION MEASURES

The main measures are described below:

Lighting

Fixed level fluorescent dimming

The installation of "Energy Controllers" reduces power consumed by selected fluorescent lighting circuits. These reduce the fluorescent lighting load watts consumed by at least 25% and reduce the current load by about 30%, thereby providing kVA demand cost savings as well as kWh savings. Energy Controllers extend fluorescent tube life by almost 30%, and as a result also reduce maintenance.

Low voltage (LV) downlight upgrade - SOW to 35W IRC electronic

Replacing existing downlight lamps and ferromagnetic transformers with new high performance 35W IRC LV lamps and electronic transformers will reduce the lighting load watts by 44% and current load by 23%.

The 35W IRC lamp life is double that of a standard SOW LV lamp, halving maintenance. The lamp produces almost the exact same amount of light as the standard LV lamp, thereby maintaining the existing lighting levels.

Occupancy sensors

The installation of "PIR" and/or "Ultrasonic" sensors, similar in appearance to smoke detectors, in various toilets, staff rooms, selected classrooms etc, to control the automatic switching on and off of fluorescent light fittings when rooms are not occupied.

Electronic timer switches

The replacement of standard light switches with similar appearance "Electronic Timer" light switches, in various small staff toilets, staff kitchenette's etc, to automatically switch off fluorescent light fittings after a short pre-programmed time, if left on.

This measure will only be undertaken in toilets with natural daylight lighting to prevent accidental room darkness.

Mechanical timer switches

The replacement of room light switches with "Energy Saver" mechanical 1-hour or 2-hour timer switches, in selected classrooms to automatically switch off fluorescent light fittings after the classroom is vacated, if lights are left on.

Recessed fluorescent light fittings

Retrofitting of various fluorescent troffers with internal super high performance "KW2" silver mirror reflectors and either high light output triphosphor or quad phosphor tube. New tube is centred and new low-loss ballast, capacitor, lampholders are installed to provide additional kWh, kVA demand and maintenance cost savings.

Surface light fitting retrofit retrofit - convert 2x36W to 1x36W etc.

Retrofitting of various fluorescent surface fittings with internal super high performance "KW2" silver mirror reflectors and either high light output triphosphor or quad phosphor tube.

Other lighting ECMs

The main lighting measures have been described in detail above, however other measures have been identified on a site specific basis. These site specific measures will be implemented to suit site conditions. These include:

- Replace incandescent lamps with integral electronic lower wattage, long life Compact Fluorescent Lamps (CFL's).
- Replace twin tube battens with single tube battens in areas with excessive lighting levels to meet code requirements - storerooms, some toilets, etc.
- Replacing reflector lamps with CFL's.
- Replace exterior security floodlights on with lower wattage, longer life floodlights.

Electrical (other than lighting)

Variable speed drives

To install 2 variable speed drives in the power circuit of swimming pool filtration system water circulating pumps.

Push button switched for air conditioning

The installation of 10 local push button switches with integral adjustable timers to operate the split air conditioning systems.

Power factor

Install 2-stage power factor correction facility next to the main switchboard

Gas

Solar heating system

To install a solar heating system to heat pool water when ambient conditions are favourable.

Thermostatic regulating valve

Replace hand operated regulating valves on the inlet to each panel radiator with a thermostatic regulating valve to maintain the pre-set space temperature by adjusting the water flow through the panel radiator.

If you would like to talk to the Commission regarding energy issue related to your church facilities, then contact Commissioner Bill Leane at bill.lean@costbenefit.com.au