1010 Beechworth Wodonga Road, WORRAGEE

ENERGY USAGE REPORT and ACTION PLAN

October 2014
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ENERGY SUSTAINABILITY REPORT

PURPOSE

This audit was conducted as a part of the Energy Efficiency Grants Program for Victorian Schools to investigate and identify areas that could be improved to assist Wooragee Primary School meet their energy usage targets and also enable them to identify areas best suited for the EEGP grant.

OVERVIEW

Wooragee Primary School underwent a rebuild in 2012 as part of the Rural School Replacement Program. There are 2 main buildings Orientation has played a large part of the planning process which is valuable to the energy requirements of the rooms.

The school is all single story with high ceilings.

There are approx 17 people on campus per day when school is in full operation. There are approx 200 days per year where the school is not in use due to weekends, school holidays or pupil free days. However approximately 6 community groups (not for profit organisations) access the school throughout the year, groups such as the CFA, Beechworth Health, the Lions Club and Probus their access is primarily to the hospitality room.

Anything Solar have identified a number of areas that can be improved which will see Wooragee Primary School meet their energy targets which will see them reducing their Greenhouse Gas Emissions and lowering their costs associated with energy in the future. This is detailed throughout the report and summarised in the recommendations.

The main concern surrounding energy were the dishwasher – very inefficient and the automation system that didn’t work properly and was using a substantial amount of power.

Electricity Usage is estimated at an average of 66kw per day for the year March 2013 to April 2014.

Gas is by LPG and is only used for hot water, cooktops and the pizza oven, and is estimated at 1 bottle per year.

Water is self-sufficient with large water tanks, 11 in total and all catching water of the various buildings and feeding necessary areas.

It is worth special mention that WPS is on a single rate for their power, $0.33c per kw.

Areas of interest are

- Dishwasher
- Window shading
- Automated system
Primary Recommendations

Windows

All windows are double glazed and tinted, there are also Holland blinds on all windows internally and are operated manually and individually.

Holland blinds offer very little thermal property. A discussion was had about creating air traps with window furnishings.

There are ventilation windows in the main building which are thermostatically controlled and operate well.

Doors

Doors were sealed well. However it was discussed that the sliding door on the kitchen building possess an issue as its very heavy and hard to open. This poses a risk in the event of an emergency. It was discussed about cleaning the brushes to allow the door move more freely, however it appears to be an installation issue and it was discussed that it would be something to follow up with the builders.

Heating

The buildings are heated by Noirot panel heaters and split systems. It is recommended that the optimum temperatures for a heater to operate at are between 18 – 22 degrees. Every degree above the recommendation will add approx 10% to your heating costs. This is something that can be presented in an educational campaign. You may even find it useful to install a thermometer in each of the rooms which can be incorporated in to the student's studies.

Cooling

The buildings are cooled by split systems and ceiling fans, the fans are used often and always the first option. There is one split system in with the server that is on all the time, there is nothing that can be changed for this. It is recommended that the optimum temperatures for a cooler to operate at are between 22 – 26 degrees. Every degree below the recommendation will add approx 10% to your cooling costs. This is something that can be presented in an educational campaign. You may even find it useful to install a thermometer in each of the rooms which can be incorporated in to the students studies.

Shading

Shading is best to be controlled – increased in Summer, decreased in Winter. Approx 80% of heat can be stopped before it hits a building.

The sun rises in the EAST and sets in the WEST therefore in summer windows facing these directions will attract the most heat in the mornings and afternoons respectively. NORTH facing windows will attract the most heat throughout the day in summer.

The kitchen has a wide verandah offering great shade. The northern aspect of the main building is elevated and hard to shade. However, there are a number of very large trees around the boundary of the school offering great shade in many areas.

Lights

Lighting is a vital aspect in a learning environment. All rooms had T8 Florescent Tubes, it is recommended that through maintenance programs to replace existing tubes with an LED tube which will reduce the power usage associated with lighting.
There are also skylights that are fire rated as the school was a new build, these skylights operate very well.

**Insulation**

As the school is only 2 years old it has R3.5 bats in all ceiling space and the floors and walls are insulated to Australian Standards.

**Appliances**

Throughout the school there were a number of appliances that are able to be turned off at the power point when not in use. Most appliances were turned off unless in use.

The building automation system has not been working properly since installed turning things on and off at inappropriate times and using a lot of unnecessary power. With the school being a small one it was found that there was no real need for this system. It is recommended that this system be disconnected.

The existing Fisher & Paykel 2 draw dishwasher is undersized and inefficient for the use of the school. It has long running cycles and doesn’t hold enough therefore requiring extra wash cycles. It was discussed that an energy and water efficient commercial style dishwasher would be more beneficial with wash cycles being much faster and the storage capacity much greater. Therefore using less power and operating much more efficiently. The school has a Stephanie Alexander Kitchen and utilise this to the best of their capability and is opened up to the broader community. All other appliances operate efficiently and effectively with the requirements of the school.

Smart Boards, computers and projectors use approx the same amount of power when switched on but not in use, these are turned off when not in use.

There are 2 photocopiers however the second one is only turned on when needed.

**Recommendations**

Overall Wooragee Primary School operates quite efficiently with only a few things needed attention some can be done reasonably quickly and others can be worked into budgets and business plans.

- Disconnect automation system
- Upgrade dishwasher to energy and water efficient commercial grade appliance
- Contact builder regarding sliding door in Kitchen building
  - And ensure that the brushes remain clean on the sliding doors
- Solar power would be of great advantage to reduce the expenditure on electricity bills. Any size from a 5-10kw would be of great advantage.
- Replace T8 fluros with LED fluros in maintenance program as they arise