Queensland Communities in transition

All Souls St Gabriels, Charters Towers – leading the way in resource efficient schools

This case study is part of a series of case studies that have been developed as part of the Queensland Communities in Transition Program. For further information, visit www.cleangrowthchoices.org[1]

All Souls St Gabriels is a co-ed combined primary/high school with over 400 students including about 170 boarders and 100 staff. Celebrating its centenary in 2020, there is a combination of new and original buildings along with a modern sports centre, agricultural land and sporting ovals. The college is situated on a 420 acre site with an additional 380 acres of leased land which is under rehabilitation. When it comes to resource efficiency, the size of the property and varying ages of buildings and infrastructure keeps Headmaster, Darren Fleming and Business Manager, Patrick McHugh on their toes.

HIGHLIGHTS

- 30% reduction in town water use since 2015
- Use of recycled council water
- 90% reduction in kitchen waste to landfill due to use of an industrial composter
- Installation of a 50 kW solar PV system saving 250 kWh per day and $27K p/year

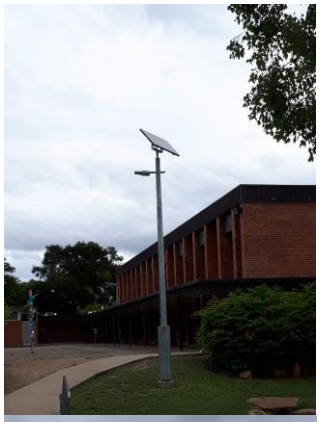
"Over the last 7 years, we've been running an ongoing program of continual improvement of efficiency upgrades. We are now seeing some fantastic savings in energy, water and waste and we are setting a great example for our students and their families. Our efforts also contribute to the sustainability of Charters Towers and we are also proud to be a part of that" ***– Patrick McHugh***.

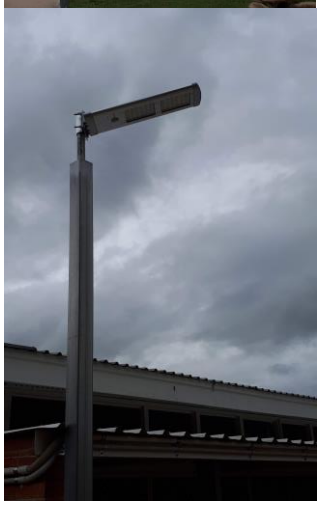
All Souls St Gabriels have significantly reduced their environmental footprint through a host of initiatives that have made savings in energy, water, fertilisers and also reduced waste.

Renewable energy supply

- A 50kW solar PV system was installed in 2015. The system boasts individual inverters for every pair of panels ensuring the maximum amount of solar energy is generated regardless of any partial shading. Installed by Country Solar, it has a Solar Edge monitoring platform with display of real time solar data. With a payback of 2.1 years, there is a performance guarantee of 250 kWh per day. This has saved us around $27K/yr electricity costs, (based on 2015 rates).

Energy efficient lighting





- Old style 36 watt fluorescent lights have been upgraded to more energy efficient LED lights. Around 90% of classrooms and 25% of the dormitories have been switched.
- External security spotlights have also been changed to solar powered LED with battery storage. The lights, which can operate for up to 2 days without sunlight, were produced in-house for around $750 compared with quotes of up to $11,000 each.
- Savings have been made through the use of photo-electric sensors and timers to switch off external lights. Previously operating from dusk to dawn, these now turn off at 9 pm.

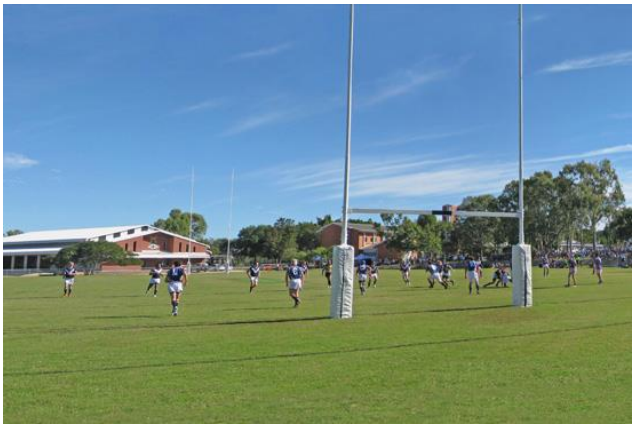
Air Conditioning

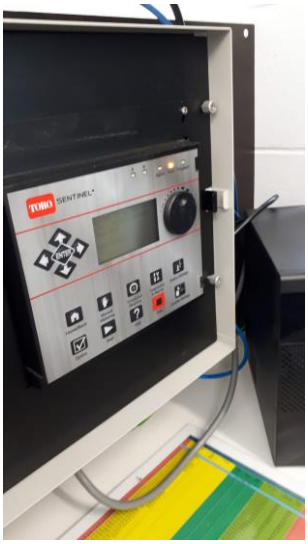
- Split system a/c units have been installed in all dormitories and classrooms. The classroom a/c times out 45 minutes (same time as a secondary school period) after being manually switched on which prevents unnecessary or excessive use.
- The system is set up so that the condenser doesn't start until the outside temperature is above 25 deg,
- The use of louvres in the dormitories and classrooms maximises the use of natural ventilation in the cooler months.
- The dormitories and kitchen have been painted with reflective paint and this is thought to have reduced internal temperature by about 5o C.
- Additional ceiling fans and a mobile evaporative air conditioner have been installed in the kitchen area for the summer months.

Water use

The school has undertaken a range of water saving measures which have resulted in a 30% decrease in potable town water use between 2015 and 2018. This includes the use of:

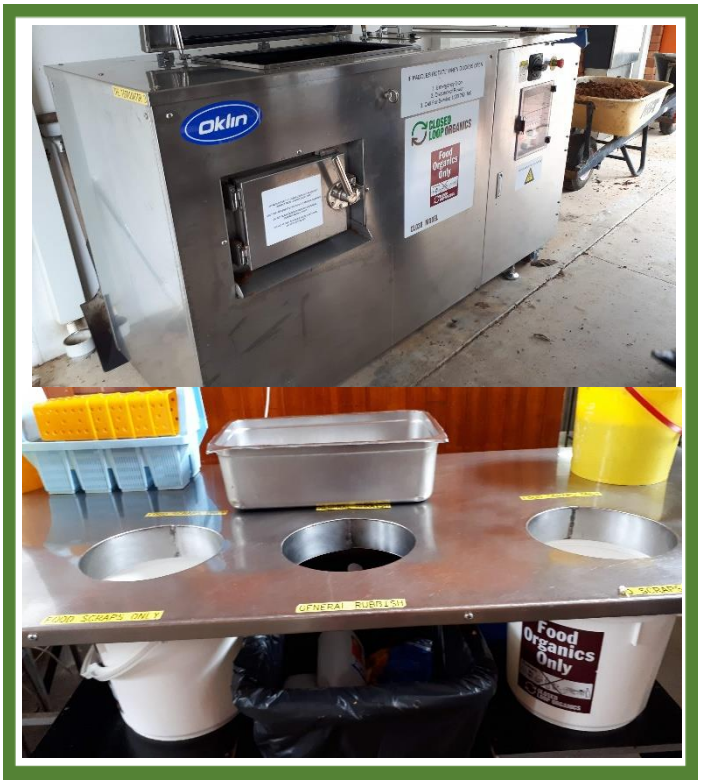
- Recycled treated council water (C Class). There are requirements around its use i.e. it can be irrigated for 8 hrs per night or 4 hrs during sunshine to ensure e-coli is eliminated and there must be a 4 hr break before access/use of fields where the water is irrigated.
- Rainwater is captured in two dams. Recycled water is retained in two 225,000 lt storage tanks which has allowed for the increased use of the treated water. As a result, potable water consumption has reduced from 55 kL to 39 kL from 2015 to 2018 as potable water is no longer used for irrigation in most areas.
- Treated recycled council water which is chlorinated on site and reclassified to A Class water, prior to storage, allows for more flexibility in its use.
- There is potential to use recycled water for toilet flushing, however the school is yet to explore this option.
- 65% of the campus is irrigated via 670 irrigation heads that have moisture sensors to ensure the optimum amount of water is used





Irrigation

- An irrigation system has been gradually expanded since 2012/13 so that now, 65% of the campus is irrigated. There are 670 irrigation heads.
- An irrigation system ring main now covers most of the school area. A TORO system control 670 irrigation heads with a series of moisture sensors and timers to ensure optimum use of the water



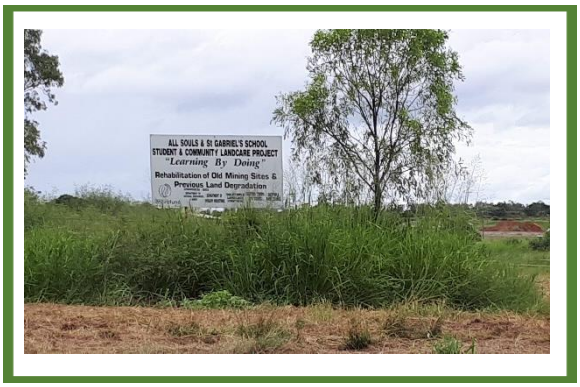
Waste

The school provides breakfast and dinner for 168 boarders and prepares lunch for 300 students and staff. There is an ongoing challenge to educate staff and students on appropriate waste disposal streams, however the school has managed to reduce waste to landfill by 90% since May 2018. Initiatives include:

- Segregation of plastic and glass bottles which are then collected by the local Lions Youth Club to raise funds via "Cash for Containers" recycling.
- Installing an industrial composter in May 2018. The Closed Loop Composting System produces nutrient rich compost after only 24 hours.
- The school was producing an estimated 456,000 litres of waste per year until an industrial composter was introduced. It is estimated that the school is now producing 418,300 litres of waste to year of which approximately 5% is recycled (Containers for Change).
- There is currently no outlet for the recycle of cardboard and paper.

Land Rehabilitation

- The school community is working on a project to rehabilitate a disused gold mine tailings dump which is located next to the school.
- There is an annual weekend for working bee – called Burry weekend.
- Activities include: exclusion from grazing, covering site with less contaminated soil, planting salt tolerant plant species and disposing of school green waste to the mind site to add organic matter and retain runoff.



1. Prepared by The Ecoefficiency Group as part of Clean Growth Choices (www.cleangrowthchoices.org) with funding from Queensland Department of Environment and Science, 2019
2. http://ecobiz.cciq.com.au/