Energy Savers Plus Program targets significant energy savings for a Lockyear Valley Horticulture Farm	SOLUTION POTENIAL ENERGY SAVINGS	
	Key facts	
	Farm / Industry	
	Horticulture	
	Product	
Carrier And Carrier State	Cabbage, cauliflower, and lettuce	
	Location	
	Lockyer Valley	
Summary	Case study focus	
A drought affected vegetable farm in the Lockyer Valley could benefit from	Pumps	
recommendations in a recent energy audit. The audit recommended to install Variable Speed Drives on existing numps, replace some numps with new install	Solution	
a 15kW solar system and soil moisture monitoring.	Install nine Variable Speed Drives, soil moisture sensors, and solar PV.	

Farm Profile

The farm, near Gatton, produces cabbage, cauliflower and lettuce and is irrigated year-round depending on rainfall. Water is supplied from on-site irrigation dams and are replenished from bores. The irrigation system used consists of a mix of solid set sprinklers and dripper tape. Bores supply water to two holding dams from where the water is pumped to the irrigation system. The current irrigation system is regularly maintained and is considered to be in line with the age of the equipment.

Current Energy Demand

It is a large site consuming 280,000 kWh at a cost of \$60,000. One of the sites is a large use customer consuming 120,000kWh. The farm harvests 9500 tonnes of crops and the current energy benchmarking is 30kWh/tonne. The infrastructure contributing to the energy consumption onsite consists of:

- Machinery sheds
- · 37kW centrifugal dam pump with VSD
- 30kW centrifugal dam pump with VSD
- 10 submersible bore pumps ranging in size from 1kW to 7.5kW on 3 separate NMIs, one with a VSD

Action

The energy audit recommended the following changes to improve efficiency and reduce costs:

- Installing Variable Speed Drives on nine pumps,
- \cdot $\,$ Replacing two pumps with smaller models (from 7.5 &5.5kW pumps to 4kW),
- Soil moisture monitoring system, and
- · Installation of a 15kW solar PV system.

The Energy Savers Plus Program Extension is funded by the Queensland Department of Energy and Public Works.





IMPLEMENTED

Results

Of the energy saving opportunities evaluated, 4 initiatives were identified with potential energy savings of 50% of the site total worth 36,644 per annum, with a combined payback period of approximately 3 years and total emission savings estimated as 114 tCO_2 -e per year.

The audit report recommendations included installing 9 VSDs on 9 pumps over 3 properties. All the pumps are small (under 7.5kW) and have varying flow requirements according to the aquifer conditions. By installing VSDs the aquifer water levels can be better managed to prevent damage to the pump and reduce electricity usage from excessive throttling of the valves. Two pumps were also identified for replacement as they were over-sized for the application. The existing pumps were 7.5 and 5.5kW and the replacements will both be 4kW pumps with VSDs. The payback period for 7 VSDs and 2 new pumps is less than 1 year.

A soil moisture monitoring system was recommended on one of the properties due to the location away from the main property. By having accurate readings of soil moisture, the grower will be able to prevent multiple trips to the other property and better manage irrigation scheduling with other personnel in the business. With the other 2 VSDs on the same NMI, the payback period would be 6.7 years.

A 15kW solar system was recommended for one of the properties which has 4 submersible bore pumps (totalling 11kW) and a 30kW irrigation pump. The system would achieve a payback period of 4 years.

Outcomes/Recommendations

The energy audit recommendations and potential benefits are summarised below:

Solution	3x VSDs and 2 new pumps	2x VSDs and monitoring system	4x VSDs	15kW solar system
Estimated Cost to implement (\$)	13,500	23,000	6,000	27,000
Annual Energy Savings (kWh)	60,000 (22%)	18,000 (6%)	40,000 (14%)	23,000 (8%)
Annual Emission Savings (†CO ₂ -e)	48.6	14.6	32.4	18.6
Annual operating cost savings(\$)	16,000	3,400	10,700	6,700
Payback Period (years)	0.85	6.7	0.5	4

Following the audit report recommendations, the grower proceeded with the 9 VSDs and the 2 replacement pumps, which can reduce the energy consumed per tonne of production by 42%.

Energy Audits for your Business

An energy audit is a great way for a business to identify the most effective way to cut costs, reduce emissions and boost productivity. The solar and soil moisture monitoring will be considered to minimise travel times between properties and better manage water resources. Post implementation benchmarking is predicted at 15kWh/tonne, a 30% reduction.

See other case studies including sector case studies and technology case studies at the website: www.qff.org.au/newsroom/case-studies/



Case studies





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