



Energy Savers Plus Program

targets significant energy savings for a

Lockyer Valley Horticulture Farm

POTENTIAL SOLUTION



POTENTIAL ENERGY SAVINGS

26%

Key facts

Farm / Industry

Horticulture

Product

Various vegetables

Location

Lockyer Valley

Case study focus

Pumps

Solution

Install variable speed drives on two pumps, and a 30kW solar system at one pump site

Summary

A drought affected vegetable farm in the Lockyer Valley could benefit from recommendations in a recent energy audit. The audit recommended to install variable speed drives on existing pumps and installing a 30kW solar system at one of the pumps.

Farm Profile

The farm, in the Lockyer Valley, produces a variety of vegetables and is irrigated year-round depending on the crop and weather conditions such as rainfall. Water is supplied from on-site irrigation dams which are replenished from rainfall. The irrigation systems used consists of a mix of solid set sprinklers, lateral move systems and central pivots fed by centrifugal pumps. The flow rate of the centrifugal pump is set by throttling the valve at the discharge side of the pump; by doing so the farmer increases the pressure at the discharge side of the pump and accordingly the water flow rate is reduced. The irrigation system is regularly maintained and is in line with the age of the equipment.

Current Energy Demand

It is a large site consuming approximately 120,000 kWh over the three NMI's assessed at a cost of \$29,000. The infrastructure contributing to the energy consumption onsite consists of:

- A large 55kW irrigation pump.
- A 45kW transfer pump.
- An 18.5kW irrigation pump on a property in a different location which supplies a centre pivot.

Action

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

- Installing a Variable Speed Drive- on the 18.5kW pump..
- Installing a Variable Speed Drive- on the 55kW pump.
- Installing a 30kW solar system- utilising solar generation effectively offset consumption at the 45kW transfer pump.
- Smart Technology- monitoring system including soil moisture sensors, water flow meters, weather sensors and pump station performance monitoring.

Results

Of the energy saving opportunities evaluated, 3 initiatives were identified with potential energy savings of 26% of the site total, energy cost savings of 34% and a combined payback period of approximately 9.3 years with emission reductions estimated in 24.9 tCO₂-e per year.

The audit report recommendations included installing Variable Speed Drives (VSDs) on two of the pumps. This would allow better control of the pump while irrigating using different pressurised systems. The VSDs on the 18.5kW and 55kW pumps would have payback periods of 2.9 and 18.16 years, respectively.

Another recommendation was to install a 30kW ground mounted solar system at the site of the 45kW transfer pump, which resulted in a payback period of approximately 8.8 years. Changing the transfer scheduling to match the solar output would allow for higher utilisation of the energy generated.

Outcomes/Recommendations

The energy audit recommendations and potential benefits are summarised below:

Solution	Installation of an 18.5kW VSD	Installation of a 55kW VSD	30kW Solar on the 45kW pump
Estimated Cost to implement (\$)	5,500	30,000	54,000
Annual Energy Savings (kWh)	8,345 (7%)	7,000 (6%)	15,375 (13%)
Annual operating cost savings (\$)	1,890	1,650	6,100
Payback Period (years)	2.9	18.16	8.8
Annual Emission Savings (tCO ₂ -e)	6.8	5.7	12.4

Following the audit report recommendations, the grower will review the recommendations and may proceed in the future.

Energy Audits for your Business

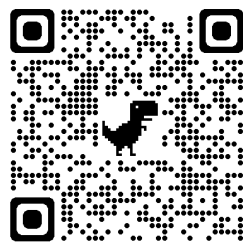
An energy audit is a great way for a business to identify the most effective way to cut costs, reduce emissions and boost productivity.

Further recommendations in the report suggested to implement an irrigation monitoring solution. The system should include soil moisture sensors, water flow meters, weather sensors and pump station performance monitoring. The probes can be installed in the arable soils for the whole growing season and linked to a digital logger that collects the data. The irrigation system could then be controlled remotely by desktop, tablet or mobile device to save water, energy and time.

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



IMPLEMENTED 42% energy savings 95.6 tCO₂-e savings 30,000^h cost savings



Case studies

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