Energy Savers Plus Program

targets significant energy savings for a

Kalbar Horticulture Farm

IMPLEMENTED SOLUTION

POTENTIAL ENERGY SAVINGS 30%

Key facts

Farm / Industry

Horticulture

Product

Vegetables

Location

Kalbar

Case study focus

Main pump

Solution

New efficient pump (implemented), and solar PV installation (planned)

Summary

A mixed vegetable farm located near Kalbar could benefit from recommendations in a recent energy audit. The audit recommended to replace an irrigation pump and installation of solar PV to offset the energy consumption.

Farm Profile

The farm, near Kalbar, produces a variety of vegetables on 75ha and is irrigated year-round depending on rainfall. Water is supplied from onsite irrigation dams which are replenished from the local irrigation scheme and bores. One centrifugal pump is used to pump water from the dam to solid set sprinklers located around the fields, boom systems and high-pressure gun. The required water pressure varies accordingly to the irrigation system used. The high-pressure gun requires the highest pressure and solid set sprinklers require the lowest pressure. The sizes of the pipes used for the delivery of the water vary from 50 to 150 mm PVC with changes in elevation in the paddocks. The farm grows 4 types of vegetables, Lucerne, and barley.

Current Energy Demand

It is a medium sized site consuming 180,000 kWh per year at a cost of approximately $50,000.

The infrastructure contributing to the energy consumption onsite consists of:

- Three bore pumps
- An old 37kW pump that pumps from the dam
- A shed with no cold room facilities
- A pump from the river that is supplied by the irrigation scheme
- A new pump with Variable Speed Drive on a seperate property also used for irrigation

Action

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

- Replacement of the dam pump
- Installation of a 10kW solar system
- Installation of a 12kW solar system

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Results

Of the energy saving opportunities evaluated, 3 initiatives were identified with potential energy savings of 53,000kWh or 30% of the site total and a combined payback period of approximately 3.8 years , with emission reductions estimated as 43.1tCO_2-*e* per year.

The audit report recommendations included replacing the existing 37kW dam pump with a new pump of the same size. A Variable Speed Drive (VSD) for the pump was also recommended due to the different pressure requirements of the irrigation systems. By replacing the pump and installing a VSD a payback period of 3.2 years could be achieved.

The audit recommend installing two solar systems. A 12kW system was recommended for the shed roof and a 10kW ground mounted system for the main irrigation pump. The 12kW and 10kW systems had payback periods of 3.8 years and 3.5 years respectively.

Outcomes/Reommendations

The energy audit recommendations and potential benefits are summarised below:

Solution	Replace dam pump	Install 10kW solar system	Install 12kW solar system
Estimated Cost to implement ($)	16,000	22,800	16,000
Annual Energy Savings (kWh)	19,000 (11%)	18,700 (10%)	15,500 (9%)
Annual EmissionSavings (tCO_2-e)	15.4	15.1	12.6
Annual operating cost savings ($)	5000	5000	4000
Payback Period (years)	3.2	3.5	3.8

Following the audit report recommendations, the grower **proceeded with replacing the dam pump** and will consider installing the solar systems 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.

Variable speed drives adjust the pump speed automatically as changes in elevation and pressure when irrigating can effect ouming efficiency. Generally the equations relating pump performance to speed are known as the Affinity Laws which are used to calculate the savings achievable by implementing a VSD.

To read up on pumps and irrigation head to our factsheets page HERE

Case studies

To see how other agriculture businesses are saving energy and costs, go to **www.qff.org.au/energysavers**