

Energy Savers Plus Program

targets significant energy savings for a

Bundaberg Sugar Cane Farm

Proposed
Solution



Potential
Energy
Savings



Site profile

A sugarcane farming enterprise located in Moore Park Beach could benefit from a recent Energy Savers Audit.

The total area of cropping lands consists of 244 ha and is divided into three sectors that are serviced by five pumps.

Although there are five operational pumps, only four analysis' are reported as one was unable to be obtained due to the drought experienced during the audit.

Farming requires constant decision making to maximise production and profit. Often irrigation systems are out of date and are in need of replacement to incorporate new technologies and updated knowledge.

Key Facts

Farm/Industry

Sugar Cane

Product

Sugar Cane

Location

Moore Park Beach, QLD

Case study focus

Pumping, irrigation and production

Solution

Installation of VFD and change to tariff 33

Current system

Pump one services 55 ha and has been experiencing operational difficulties noted as severe pump cavitation, slow system fill on start-up, evidence of iron oxide issues and some pipe fitting irregularities. This pump provides water to a high-pressure gun and low-pressure flood irrigation.

Pumps two, three and four are interconnected by underground mainline which supplies water to 139 ha. Pumping distances and efficiency issues associated with friction means that the best operational procedure in sector two is to irrigate the area closest to each pump.

Pump five draws its water supply from the Bundaberg surface water supply scheme and has a system design that manages distribution pressure via a manual check valve. Unfortunately, this is a highly expensive way to achieve this outcome.

Pump four is located on a gully dam within grazing land attached to the sugarcane operation. The pumping unit is relatively new and is fitted with VFD and connected to Tariff 33.

An operating audit of Pump four was not possible as the dam water level was very low due to the current drought conditions

Energy consumption from the site showed that a total 426,071 kWh at a cost of \$91,008 was used during the 2018-2019 period.

Action

A recent energy audit showed how improving the current systems can lead to energy and cost savings. The recommendations explored in the audit included:

- The installation of VFD to pumps one, two, three and five.
- Conversion to Tariff 33 at pumps two, three, and five.

Results

The addressing of the operational issues related to iron sludge restrictions and replacement of suction pipe fittings at pump one will improve the functionality of the pumping system and improve performance.

Results cont.

Repairs and maintenance or replacement of the Southern Cross pump will further enhance functionality and performance of the pumping system.

Energy demand and consumption will decline with the introduction of VFD technology which will manage the system operating head (m) to meet the specific target demand.

The audit assessment for pumps two, three and five indicates that they operate at a higher total head (m) than is required to deliver the target demand. A VFD is proposed for each of these pumping systems to provide management of the system operating heads (m) to the specific target demand. Conversion to Tariff 33 is recommended for each of these systems as well to maintain lower energy cost over the longer term.

The combined effect of all the recommendations will reduce the annual enterprise energy demand by an estimated 98,031 kWh saving \$37,471 to yield approximately 18,000 tonnes annually.



Outcomes

Recommendation	Crop	Estimated Cost to Implement	Energy Savings (kWh)	Cost Savings	Cost Savings (Inc. productivity gain)	Payback Period (Years)
Pump 1 – Installation of VFD	Sugarcane	\$10,800	23,401	\$8,401	\$8,401	1.3
Pump 2 – Installation of VFD & Change to Tariff 33	Sugarcane	\$10,000	14,913	\$8,060	\$8,060	1.2
Pump 3 – Installation of VFD & Change to Tariff 33	Sugarcane	\$10,000	22,008	\$9,437	\$9,437	1.1
Pump 5 – Installation of VFD & Change to Tariff 33	Sugarcane	\$10,000	44,852	\$12,931	\$12,931	0.8
TOTAL	Sugarcane	\$40,800	105,174	\$38,829	\$38,829	1.1

Conclusion/Farmer Feedback

The recommendations from the energy audit would result in huge savings for this Sugarcane Farming Enterprise in Moore Park Beach.

	Cost/ML	kWh/ha
Before recommendations	\$125/1ML	1746 kWh/1ha
After recommendations	\$73/1ML	1344 kWh/1ha

Progressive development of the pump site technology including VSD capacity and a change to tariff 33 has lowered both energy demand and unit cost which places the system in a strong position into the future. By installing all the recommendations of the audit, the business could reduce energy consumption by 25%.

Case studies

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