

Energy Savers Plus Program

targets significant energy savings for a

Queensland Sugar Cane Farm

Proposed
Solution



Potential
Energy
Savings

48%

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 63 ha and is serviced by one pump operating two irrigation systems; a high pressure travelling big gun and low pressure surface furrow system.

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Often irrigation systems are out of date and are in need of replacement to incorporate new technologies and updated knowledge.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 new pump, motor & VFD

Current system

The current irrigation systems run off the one pump. The high-pressure system irrigates a significant proportion of the farm with an average energy use of 530 kWh per ML of water pumped.

While where the topography of the land allows, a low-pressure furrow irrigation system is used, as the energy use is much less at around 166 kWh/ML of water pumped.

Unfortunately this furrow system can only be used on a small section of the farm due to the lay of the land and soil types. Although it is also noted that the annual energy utilisation by the irrigation pumping systems are directly relative to impact of seasonal rainfall on the daily moisture demand of the sugarcane crop.

During the energy audit, the farmer switched from Tariff 66 to Tariff 33. This adaption has seen a reduction in energy cost relative to the volume of energy consumed.

Action

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

- The replacement of pump, motor and installation of a Variable Frequency Drive (VFD) at the main pump.

Results

Energy consumption from the pump site showed that a total 68,851 kWh at a cost of \$ 17,756 was used during the 2018-2019 period.

The replacement of the pump and motor and the installation of the VFD at the pump will lead to a significant reduction in energy use and cost, and will provide potential for sustainability of current levels of high productivity.

The new motor will improve motor efficiency by 4-5% and the new pump will feature more efficient design

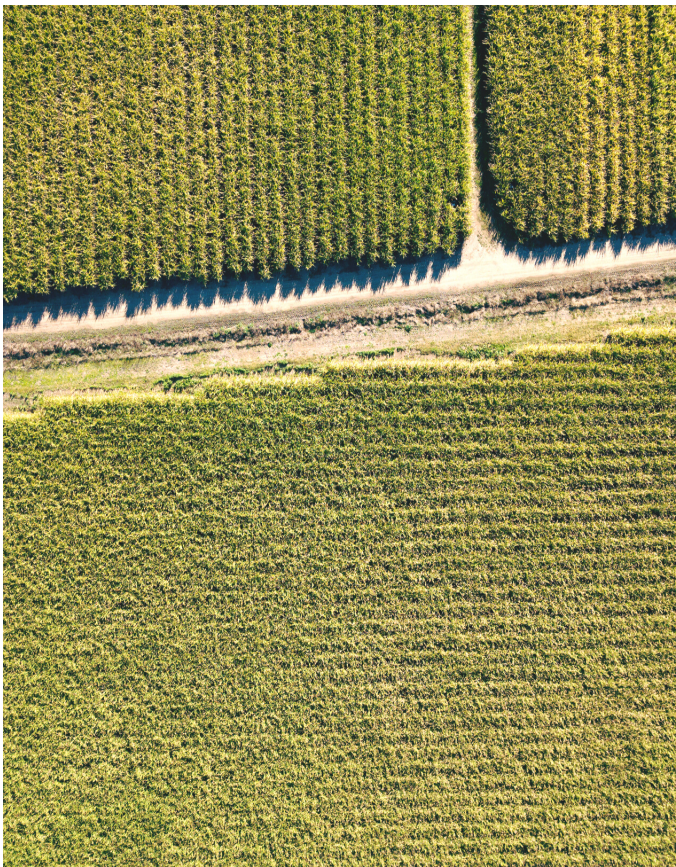
Results cont.

and task suitability which is estimated to improve pump efficiency by about 18% when operated in the travelling gun high-pressure mode, and 10% when operating in the flood low-pressure mode.

Inclusion of the VFD will manage friction head in the mainline pipe by managing the correct pressure relative to the operating distance from the pump.

The installation of a VFD will also remove the need to change drive belts to adjust operating speeds when lower pump speed is required for furrow operation. This can be a very dangerous task when the pump is hot and the VFD will eliminate the need for this activity and create a much safer operating environment.

The quoted cost of the combined motor, pump and VFD upgrade is \$17,366 ex GST which with an estimated annual saving of \$10,156 is predicted to provide a simple payback period of 1.7 years.



Outcomes

Recommendation	Crop	Estimated Cost to Implement	Energy Savings (kWh)	Cost Savings	Cost Savings (Inc. productivity gain)	Payback Period (Years)
Pump 1 – Installation of pump, motor and VFD	Sugarcane	\$17366	32744	\$10156	\$10156	1.7
TOTAL	N/A	\$17366	32744	\$10156	\$10156	1.7

Conclusion/Farmer Feedback

This energy audit for a Sugarcane Farming Enterprise in Moore Park Beach proposes higher efficiency via VFD technology and the use of efficient motor and pumping equipment to reduce the annual kWh's of energy used which will enhance the profitability and productivity potential of the enterprise.

	Cost/ML	kWh/ha
Before recommendations	\$86/1ML	1092 kWh/1ha
After recommendations	\$36/1ML	573k Wh/1ha

The combined effect of the upgrade will reduce the annual energy demand by an estimated 32,744 kWh, which when calculated at the sites new tariff rate will result in a cost saving of \$10,156.

By installing all the recommendations of the audit, the business could reduce energy consumption by 48%.

Case studies

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