

Energy Savers Plus Program

targets significant energy savings for a

Gin Gin Sugar Cane Farm

Proposed
Solution



Potential
Energy
Savings

34%

Site profile

A sugarcane farming enterprise located in Gin Gin, could benefit from a recent Energy Savers Audit.

The farm area consists of 121 ha however much of the land is not or will not be used for cropping. The cropping area is around 60 ha which is serviced by two pumps at two different locations. .

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Often irrigation systems are out of date and are in need of replacement to incorporate new technologies and updated knowledge.

Current system

The current irrigation system is run by two pump sites on two separate farms in Gin Gin.

While the cultivated land for the first property is 81 ha, pump one only irrigates a relatively small area of 18.75 ha. It uses a high-pressure travelling gun system and to date, the efficiency of the pump (67%) has been relatively good. However it could be much better as indicated by the recommendations in the energy audit.

On property two, the total cropping area is 52 ha. It was historically used for sugarcane cropping however it is currently being used for grazing cattle.

The plan is to return around 40 ha to sugarcane production and run it through pump two. The Irrigation Pump Evaluation and Reporting Tool (IPERT) report indicated that pump two efficiency was low (44.85%) and cost at peak time use was high (\$129.75/ML). The proposal is to use a centre pivot irrigation system as recommended in the energy audit.

Energy consumption from the two pumps sites showed that a total 78,510 kWh at a cost of \$20,843 was used during the 2018-2019 period while on tariff 65 (based on projections for pump two as the property is in development stage).

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:

- Install Variable Speed Drive (VSD) to pump one
- Install centre pivot irrigator at pump site two.
- Change to tariff 33.

Results

The energy audit has recommended that a VSD be installed at pump one. Energy demand is estimated to improve by 30% with the installation of a VSD. This will lead to a predicted drop in energy use and cost to 19,060 kWh and \$3,892 respectively when included with a conversion to Tariff 33.

Key Facts

Farm/Industry

Sugar Cane

Product

Sugar Cane

Location

Gin Gin, QLD

Case study focus

Pumping, irrigation and production

Solution

Installation of VSD, installation of centre pivot irrigation system, change to tariff 33.

Results cont.

Another recommendation from the energy audit was to reduce the amount of high pressure irrigation used at pump site two by installing low pressure overhead (centre pivot) irrigation which will provide the capacity to deliver sufficient water at an application rate within the daily demand of the crop. This will provide lower operating cost and the potential for sustained long term high levels of production.

The splitting of the farm irrigation duty to 60% pivot (24 ha) with the remainder of the area continuing with travelling gun under the proposed upgrade will enable simultaneous operation which will allow both irrigation systems to meet the crop demand.

The combined benefit of this upgrade at pump two is predicted to reduce future energy demand to 17,433 kWh which when combined with the introduction of Tariff 33 is estimated to reduce energy cost by \$7,019.

The estimated cost of the planned combined upgrade is \$201,000. It is estimated that annual energy cost saving will be \$10,911 and potential net return from improved productivity of \$28,800



Outcomes

Recommendation	Estimated Cost to Implement	Standard Electricity Tariff	Energy Savings (kWh)	Electricity Savings	Cost Savings (Inc. productivity gain)	Payback Period (Years)
Pump 1 – Installation of VSD	\$6,077	65	9,530	\$2,522	\$2,522	2.4
Pump 2 – Installation of Centre Pivot	\$189,478	65	17,443	\$4,637	\$33,437	5.7
Pump 1 & 2 - Change to Tariff 33	\$5,000	33	N/A	\$3753	\$3753	1.3
Total	\$200,555		26,973	\$10,912	\$39,712	5.1

Conclusion/Farmer Feedback

The recommendations from the audit would result in huge savings for this Sugarcane Farming Enterprise in Gin Gin. The combined effect of the proposed upgrades will reduce the annual energy consumption by an estimated 26,973 kWh saving \$10,912 and increase production by approximately 960 tonnes of cane annually which at a cane price of \$37 (less harvesting cost of \$7 per tonne cane) will provide additional net income of \$28,800 annually.

	Cost/ML	kWh/ha
Before recommendations	\$77/1ML	1,308 kWh/1ha
After recommendations	\$35/1ML	859 kWh/1ha

Progressive development of the pump site technology including VSD capacity and the installation of a centre pivot system will lower energy demand and unit cost which places the system in a strong position for the future. If all recommendations are carried out, it is predicted to provide a simple payback period of 5.1 years and an actual energy saving of 34%.

Case studies

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