

# Energy Savers Plus Program

targets significant energy savings for a

## Queensland Sugar Cane & Sweet Potato Farm

Proposed Solution



Potential Energy Savings

60%

### Site profile

A sugarcane and sweet potato farming enterprise located in Moore Park Beach QLD, could benefit from a recent Energy Savers Audit.

The total area of cropping lands consists of 64.4 ha and is serviced by two pumps.

Farming requires constant decision making to maximise production and profit.

Crops are often rotated due to season changes, weather variations and higher value products though sometimes the systems in place are outdated.

### Current system

The current irrigation system is run by two individual irrigation pumping units.

Pump site one (Bottom pump) supplies water to 20.8 ha of sweet potato crops through trickle irrigation. It has a high input flow rate and is capable of sustaining systems like a low pressure lateral move. This system currently uses mechanical valves to manage the fluctuation in supply pressure and to reduce pump output.

Pump site two (Top pump) supplies water to 23.2 ha of sugarcane through a big gun travelling irrigator. It also has a high input flow rate and is capable of simultaneous operation of up to three travelling gun irrigators. It too was installed prior to the development of variable frequency technology and uses mechanical valves.

Both pumps receive their water supply from the Bundaberg Irrigation Water Supply system which is managed by Sunwater.

### 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 two Variable Frequency Drives (VFD) to existing irrigation systems
- Complete electrical works to move to Tariff 33
- Replace existing irrigation systems to lateral move irrigators (50% share).

### Results

Energy consumption from the two pumps sites showed that a total 91,453 kWh at a cost of \$24,226 was used during the 2018-2019 period.

One recommendation from the Energy Audit was to install a lateral move irrigator on both systems. Results show a cost reduction due to reduction in the operating head and increased pumping flow rate. This system could also result in an increase in production capacity of up to 20% per hectare in sugarcane.

## Key Facts

### Farm/Industry

Sugar Cane & Small Crops

### Product

Sugar Cane & Sweet Potato

### Location

Moore Park Beach, QLD

### Case study focus

Pumping, irrigation and production

### Solution

Installation of VFD, Connection to Tariff 33. And replacement of existing irrigation systems to lateral move irrigators.

## Results cont.

It is also estimated that the adoption of tariff 33 will result in a 26.4% reduction in business as usual energy costs.

The combined effect of the recommendations will reduce the annual energy demand by around 54,687 kWh saving \$20,073. It will also increase sugarcane production by an estimated 350 tonnes of cane annually. While estimated additional annual sweet potato production of 100 t/sp valued at \$10/18kg carton net of harvesting which is an increase \$2,750 per ha (Total \$55,000 per year).

The estimated cost of the planned combined upgrade is \$260,000. It is estimated that annual energy cost savings will be \$20,073 and potential net return from improved productivity will be \$66,250.



## Outcomes

Recommendation	Paddock Area (ha)	Crop	Standard Electricity Tariff	Energy Savings (kWh)	Cost Savings	Payback Period (Years)
<b>Pump 1 - Tariff 33</b>	20.8	Sweet Potatoes	T33+20	N/A	\$3,170	0.8
<b>Pump 1 – Installation of VFD</b>	20.8	Sweet Potatoes	T33+20	21,601	\$6,244	1.5
<b>Pump 1 – Replace with Lateral Move Irrigator</b>	20.8	Sweet Potatoes	T33+20	6,121	\$56,113	2.1
<b>Total</b>	<b>20.8</b>	<b>N/A</b>	<b>T33+20</b>	<b>27,722</b>	<b>\$65,527</b>	<b>2.0</b>
Recommendation	Paddock Area (ha)	Crop	Standard Electricity Tariff	Energy Savings (kWh)	Cost Savings	Payback Period (Years)
<b>Pump 2 - Tariff 33</b>	23.2	Sugarcane	T33+20	N/A	\$3,091	0.8
<b>Pump 2 – Installation of VFD</b>	23.2	Sugarcane	T33+20	14,339	\$4,160	2.3
<b>Pump 2 – Replace with Lateral Move Irrigator</b>	23.2	Sugarcane	T33+20	12,626	\$13,545	8.7
<b>Total</b>	<b>23.2</b>	<b>N/A</b>	<b>T33+20</b>	<b>26,965</b>	<b>\$20,796</b>	<b>6.25</b>

## Conclusion

An energy audit is a great first step in moving a business towards a more efficient future by reducing energy use, costs and carbon emissions onsite. The recommendations from the audit would result in huge savings for this Sugarcane and Sweet Potato Farming Enterprise in Moore Park Beach.

A simple payback period of 3.01 years for cost recovery is envisaged. By installing all the recommendations in the audit, the business could reduce energy consumption by 60%.

## Case studies

To see how other agriculture businesses are saving energy and costs, go to [www.qff.org.au/projects/energy-savers/](http://www.qff.org.au/projects/energy-savers/)