

# Irrigators Energy Savers Program

targets significant energy savings for a  
Central Queensland sugar cane farm

PROPOSE  
D  
SOLUTION



Potential  
energy  
savings

25%

## Key facts

### Farm / Industry

Sugar cane

### Product

Sugar cane and  
pineapples

### Location

Bundaberg

### Irrigation

Travelling gun

### Pumps

Submersible and  
centrifugal

### Solution

**Proposed:**  
Pump and motor  
replacement with  
variable speed drive

*The Irrigators Energy Savers Program was funded by the Queensland Department of Agriculture and Fisheries*



## Farm profile

The farm cultivates sugar cane north of Bundaberg, with irrigation provided by bore water as well as SunWater. Crop diversification to pineapples is currently being trialled for one plot.

The main irrigation period is from September to April when irrigation is undertaken overnight and runs an average of 16 hours per day. Soil moisture is monitored to inform irrigation requirements but information in the audit report suggests that results rarely influence the irrigation schedule.

### Current irrigation

The irrigation system comprises:

- Travelling gun irrigators that disperse water over the crops.
- Seven submersible bore pumps that draw water from underground to supply the travelling irrigators (4 x 30kW bore pumps and 3 x 37kW pumps).
- One 45kW centrifugal pump draws water from the Sunwater irrigation channel to supplement the irrigation supply.

### Action

An energy audit of the pumping systems evaluated:

- installing variable speed controls
- replacement with more energy efficient drive units
- resizing pumps.

### Results


Of the energy-saving opportunities evaluated, several initiatives were identified with short-term savings of up to 25% and a payback period of 2.8 years (approx). The energy audit recommendations included a suggestion to review the tariff pricing structure for each pump electricity account to realise significant savings of \$10,000 per annum (approx).

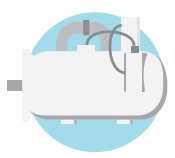
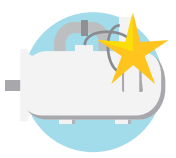

The report also recommended a strategy to replace the existing pump and motor installations with variable speed drive compatible units. On three pump sites, the payback period was less than 3.3 years and, for the five other locations, the payback ranged from 4.4 to 8.3 years.



# Recommendations

The energy audit recommendations are summarised below:

Solution	 <p><b>Pump and motor replacement with variable speed drive</b></p>
Est. energy savings (kWh/annum)	33,445
Est. operating cost saving	\$16,495
Est. cost to implement	\$46,000
Payback period (years)	2.8
Est. demand reduction (kW)	33
Est. energy savings	25%

Forecast savings in pump operating costs	 <p><b>Existing system</b></p>	 <p><b>Upgraded system</b></p>	 <p><b>Reduction in operating costs</b></p>
Annual pump operating cost	\$51,627	\$35,132	-
Cost to implement	-	\$46,000	-
Operating costs for first 3 years	\$154,881	\$151,396	\$3,485
Annual pump operating cost for years 4 to 10	\$51,627	\$35,132	\$16,495
<b>Total pumping costs for 10 years</b>	\$516,270	\$397,320	\$118,950

## Farmer feedback

The farm owner has been focusing on upgrading the existing underground reticulation to improve water efficiency by reducing losses in pipework from leaks. Planning is underway to progressively implement audit recommendations to realise the potential reduced irrigation electricity costs.

**This case study was originally developed during 2017-18 as part of the Queensland Government funded Irrigators Energy Savers Program, delivered by the Queensland Farmers' Federation.**