

Irrigators Energy Savers Program

targets significant energy savings for a
Central Queensland sugar cane farm

PROPOSED SOLUTION 

Potential energy savings

19%

Key facts

Farm / Industry

Sugar cane

Location

Childers

Irrigation

Travelling gun and centre pivot

Pumps

Centrifugal

Solution

Proposed:

Replace oversized pumps and install variable speed drives

Farm profile

The farm is a large sugar cane producer located in the Childers area with land holdings comprising 30 farms.

Water is sourced primarily from the SunWater Scheme, with a small amount of water supplied from the four dams located in low-lying areas of the subject properties.

The main crop irrigation period is from September to April where irrigation mostly operates overnight, from 12 to 20 hours a day.

Current irrigation

The irrigation system comprises:

- 22 travelling gun irrigators.
- Four centre pivot irrigators (1 x 517m and 3 x 198m span).
- Eight individual pumping stations ranging between 28kW and 45kW. Four of the pumps supply the centre pivots, with the remaining four supplying the travelling irrigators.

Action

An energy audit of the pumping systems evaluated:

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

Results

Of the energy saving opportunities evaluated, several initiatives were identified with short-term savings of up to 19% and a payback period of 2.1 years (approx). These short-term initiatives included replacing four of the irrigation pumps (that were oversized by between 33% to 49%) to better regulate flow and installing a variable speed drive on one of these pumps.

Other recommendations were associated with replacing another oversized irrigation pump and installing variable speed drives on three additional pumps. These drives are suitable because of the distance and changing elevation requirements of the centre pivots and subsequent pressure requirements. These initiatives have longer payback periods of over 6 years.



The audit recommendations also included reviewing the tariff pricing structure for a number of pump electricity accounts to realise savings of up to \$600 per annum.

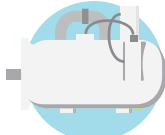


The Irrigators Energy Savers Program was funded by the Queensland Department of Agriculture and Fisheries



Recommendations

The energy audit recommendations are summarised below:

Solution	  Replace three oversized pumps and install a variable speed drive
Est. energy savings (kWh/annum)	52,633
Est. operating cost saving	\$14,114
Est. cost to implement	\$29,500
Payback period (years)	2.1
Est. demand reduction (kW)	68
Est. energy savings	19%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	\$67,831	\$53,717	-
Cost to implement	-	\$29,500	-
Operating costs for first 3 years	\$203,493	\$190,651	\$12,84
Annual pump operating cost for years 4 to 10	\$67,831	\$53,717	2
Total pumping costs for 10 years	\$678,310	\$566,670	\$14,11 \$111,640 4

Farmer feedback

The owner has not yet started implementation of the recommendations due to recent activities associated with crop diversification to macadamias. Timing to implement the short-term recommendations is subject to completion of the planting phase of the crop diversification.

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.