

Irrigators Energy Savers Program

targets significant energy savings for a
Central Queensland sugar cane farm

PROPOSED SOLUTION 

Potential energy savings  10-33%

Key facts

Farm / Industry

Sugar cane

Location

Bundaberg

Irrigation

Flood

Pumps

Centrifugal

Solution

Proposed:

Replace pumps and install variable speed drives

Farm profile

The farm, located south of Bundaberg, comprises a number of lots in close proximity for the cultivation of sugar cane. Crop changes occur on a rotational basis to maintain nitrogen levels in the soil.

Flood irrigation is mainly used. The system consists of several discrete pumping stations with submersible pumps drawing water from bores and centrifugal booster pumps as required.

The main irrigation period is from September to April. During this period, pumping is undertaken mostly overnight with irrigation operating up to 16 hours per day.

Current irrigation

The irrigation system comprises:

- Ten bore pumps ranging from 19kW to 33kW that transfer water to the flood irrigation system.
- Five centrifugal booster pumps ranging from 15kW to 22kW that boost water pressure from selected bore pumps where required to service a travelling irrigator.
- One 22kW centrifugal surface water pump with additional 11kW booster pump in series that transfers water within the site's underground distribution system.

Results

Of the energy-saving opportunities evaluated, 10 initiatives were identified for pump replacement and implementation of variable speed control on selected pumps with an average payback period of 5.9 years (approx).

Of these 10 initiatives, two have payback periods of 3.5 years for pump and motor replacements with variable speed control and these have been used in the recommendations table.

A further eight initiatives (pumps) were identified for tariff changes with average savings \$280 per year per account.

Action

An energy audit of the pumping systems evaluated:

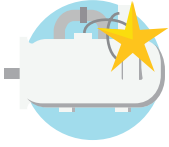

- installation of variable speed controls
- replacement with more energy efficient drive units.

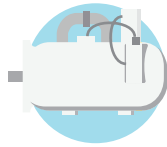
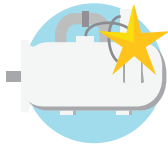

The Irrigators Energy Savers Program is funded by the Queensland Department of Agriculture and Fisheries



Recommendations

The energy audit recommendations are summarised below:

Solution	  Replace pumps and install variable speed drives on 2 of 11 pump installations
Est. energy savings (kWh/annum)	25,448
Est. operating cost saving	\$6,026
Est. cost to implement	\$21,000
Payback period (years)	3.5
Est. demand reduction (kW)	7
Est. energy savings	10% to 33%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	\$55,072	\$49,046	-
Cost to implement	-	\$21,000	-
Operating costs for first 4 years	\$220,288	\$217,184	\$3,104
Annual pump operating cost for years 5 to 10	\$55,072	\$49,046	\$6,026
Total pumping costs for 10 years	\$550,720	\$511,460	\$39,260

Farmer feedback

The farm owner indicated an intention to proceed with the audit recommendations in the event that equipment failure allowed an opportunity to upgrade.