

Irrigators Energy Savers Program

targets significant energy savings for a
Central Queensland sugar cane farm

PROPOSED SOLUTION 

Potential energy savings

14%

Key facts

Farm / Industry

Sugar cane

Location

Bundaberg

Irrigation

Flood

Pumps

Centrifugal

Solution

Proposed:

Recondition pumps and replace pipework

Farm profile

The farm cultivates sugar cane south of Bundaberg, using flood irrigation, with some small crops grown for nitrogen replenishment. Water is dispersed around the farm using irrigation channels, supplied from dam storage and bores, using 25 separate pumping stations.

There are on-site water storage dams as well as several aquaculture ponds. Of the 25 pumping stations, 14 were reviewed as part of the energy audit.

Current irrigation

The 14 pump stations that were reviewed comprise:

- One 15kW bore pump that supplies water to the aquaculture ponds.
- One 37kW bore pump that supplies the irrigation pipe network.
- Seven centrifugal pumps that transfer water from irrigation channels to the irrigation pipe network, ranging from 15kW to 30kW.
- One 22kW centrifugal pump that transfers water from the Elliot River to the irrigation pipework.
- Two 160kW centrifugal pumps that transfer water from the tail water dam to the storage dam.
- One 30kW centrifugal pump that pumps water between different channels.
- Two 132kW centrifugal pumps that supply the irrigation channels from the storage dam.

with short-term energy savings of 14% and a payback period of 0.9 years (approx). The payback periods for the recommendations ranged between 0.3 and 15.9 years with six recommendations having payback periods under 3 years. These initiatives include:

- Reconditioning of a worn out 15kW and a 30kW centrifugal pump to bring them back to their original performance specification.
- Upgrades on pipework from the 30kW centrifugal pump above from 150mm steel to 200mm uPVC.
- Upgrading pipework on another of the 30kW centrifugal pumps from 150mm to 200mm steel.
- Replacing one of the 22kW centrifugal pumps to be more suited to its application.

The energy audit recommendations also included a suggestion to review the tariff pricing structure for the electricity accounts for four pumps to realise savings up to \$5,728 per annum.

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



Action

An energy audit of the pumping systems evaluated:

- pump reconditioning
- replacement with more energy-efficient drive units
- piping upgrades
- resizing pumps.

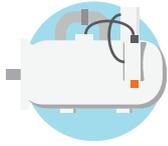
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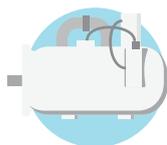
Of the energy-saving opportunities evaluated, several initiatives were identified



Recommendations

The energy audit recommendations are summarised below:

Solution	 
	Recondition pumps, upgrade pipework and replace one pump with a more suitable type
Est. energy savings (kWh/annum)	75,884
Est. operating cost saving	\$19,726
Est. cost to implement	\$16,930
Payback period (years)	0.9
Est. demand reduction (kW)	35
Est. energy savings	14%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	\$253,302	\$233,576	-
Cost to implement	-	\$16,930	-
Operating costs for first 2 years	\$506,604	\$484,082	\$22,522
Annual pump operating cost for years 3 to 10	\$253,302	\$233,576	\$19,726
Total pumping costs for 10 years	\$2,533,020	\$2,352,690	\$180,330

Farmer feedback

The farm owner acknowledged the considerable savings to be made and has started to implement a number of the recommendations from the energy audit.