Irrigators Energy Savers Program

targets significant energy savings for a

Queensland cotton farm

PROPOSED SOLUTION

Potential energy savings 29%

Key facts

Farm / Industry

Cotton

Location

St George

Irrigation

Flood

Pumps

Centrifugal

Solution

Proposed:
Change pump operation and install variable speed control

Farm profile

The farm produces cotton and is located just outside St George, approximately 500km west of Brisbane.

Two pumping stations, with two electric pumps each, transfer water around the farm for flood irrigation all year round. A dam is maintained on-site for water supply, and a series of reticulation channels transports water around the farm.

Current irrigation

The irrigation system comprises:

- Pump Station 1 has a 75kW centrifugal pump and a 250kW pump that transfer water from the main dam to the irrigation channels. There is also a 75kW diesel motor to supplement irrigation requirements.
- Pump Station 2 has a 230kW mixed flow pump that lifts overland flow from the property into a large dam. A secondary pump can be driven with a tractor shaft, if required.

Action

An energy audit of the pumping systems evaluated:

- pump and motor replacements
- installation of variable speed control
- piping modifications.

Results

Of the energy-saving opportunities evaluated, two initiatives were identified with potential short-term savings of 29% and a payback period of 1.3 years (approx).

The energy-efficiency opportunities identified in the audit included changing the pump operation at Pump Station 2 so that the 230kW electric pump can operate closer to its best efficiency point. The tractor shaft pump can then be operated to make up for the difference in supply at a cheaper rate.

The other opportunity identified in the audit, with short-term savings, is to install a variable speed drive on the 75kW pump at Pump Station 1 and replace the pump impeller with a full-size version. This would increase the pump efficiency from 76% to 86%.

The audit report also suggests a review of the tariff pricing structure for each pump's electricity account to save up to $3,500 per annum.

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

QFF

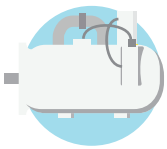
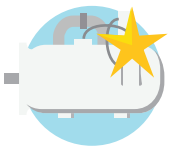
ERGON ENERGY NETWORK

Queensland Government

Recommendations

The energy audit recommendations are summarised below:

Solution	 Change pump operation and install variable speed control
Est. energy savings (kWh/annum)	46,838
Est. operating cost saving	$6,024
Est. cost to implement	$8,000
Payback period (years)	1.32
Est. energy savings	29%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	$42,547	$36,523	-
Cost to implement	-	$8,000	-
Operating costs for first 2 years	$85,094	$81,046	$4,048
Annual pump operating cost for years 3 to 10	$42,547	$36,523	$6,024
Total pumping costs for 10 years	$425,470	$373,230	$52,240

Farmer feedback

The owner intends to implement a number of the audit recommendations and will review the timing for implementation following installation of a 60kW solar photovoltaic system on-site.

Case studies

To see how other agriculture businesses are saving energy and costs, go to **www.qff.org.au/energysavers**