Irrigators Energy Savers Program

targets significant energy savings for a

Queensland sugar cane farm

PROPOSED SOLUTION

Potential energy savings 4-11%

Key facts

Farm / Industry

Sugar cane

Location

Giru

Irrigation

Flood

Pumps

Shaft type bore pumps

Solution

Proposed:
Motor replacement and variable speed drive

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

Farm profile

The 180 hectare farm in Giru, south-east of Townsville, produces sugar cane using flood irrigation with water sourced from aquifer bore pumps. Water use varies annually and is largely dependent on the level of rainfall.

As pumps maintain a constant flow, the volume of water is varied with time of use.

Current irrigation

The irrigation system comprises:

- Several bore pumps that draw water from the underground aquifer into the irrigation reticulation system.
- A shaft pump, assessed as a typical example, is situated 14 metres below ground and powered by a 30kW motor.
- The reticulation system includes underground pipes that service the entire farm.

Action

An energy audit for the pump installation evaluated:

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

Results

Of the above energy-saving opportunities, two options were identified with possible savings of 4% to 11% and a payback period of 6.2 to 8.7 years (approx).

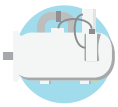
Option 1: The first option would be to replace the 15 year old 30kW shaft pump with a more efficient 22kW pump.

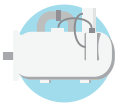
Option 2: The second option would be to replace the shaft pump and implement variable speed drive control.

Recommendations

The energy audit recommendations are summarised below:

Solution	 **Option 1 –** Replace shaft pump	  **Option 2 –** Replace shaft pump and implement variable speed drive
Est. energy savings (kWh/annum)	2,469	5,900
Est. operating cost saving	$1,175	$2,057
Est. cost to implement	$7,300	$18,000
Payback period (years)	6.2	8.7
Est. demand reduction (kW)	1	2.6
Est. energy savings	4%	11%

Forecast savings in pump operating costs **Option 1**	 Existing system	 Upgraded system	 Reduction in operating costs
Annual operating cost	$15,762	$14,587	-
Cost to implement	-	$7,300	-
Operating costs for first 7 years	$110,334	$102,109	$8,225
Annual pump operating cost for years 8 to 10	$15,762	$14,587	$1,175
Total pumping costs for 10 years	$157,620	$153,170	$4,450

Forecast savings in pump operating costs **Option 2**	 Existing system	 Upgraded system	 Reduction in operating costs
Annual operating cost	$15,762	$13,705	-
Cost to implement	-	$18,000	-
Operating costs for first 9 years	$141,858	$141,345	$513
Annual pump operating cost for year 10 onwards	$15,762	$13,705	$2,057
Total pumping costs for 10 years	$157,620	$155,050	$2,570

Farmer feedback

The farm owner has indicated a willingness to replace the drive unit of the pump with a more energy-efficient motor (22kW) (Option 1 of the audit recommendations). Timing for installation will be during the next wet season period when rainfall provides relief from regular irrigation cycles.

 Case studies

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