

Irrigators Energy Savers Program

targets significant energy savings for a North Queensland horticulture farm

PROPOSED SOLUTION 

Potential energy savings 

Key facts

Farm / Industry

Horticulture

Product

Produce crops and sugar cane

Location

Burdekin

Irrigation

Drip and micro irrigation

Pumps

Centrifugal

Solution

Proposed:
Variable speed control

Farm profile

The farm and retail store operate inland from Ayr on the Burdekin River. With a mean annual rainfall of 763mm, the farm cultivates various produce crops as well as sugar cane.

A trickle irrigation system with one main electric pump is used on the home block and a diesel pump on the back block. Water is accessed from SunWater.

Current irrigation

The irrigation system comprises:

- One 18.5kW centrifugal pump that pumps water from the irrigation supply channel to the irrigation system on the home block. A bank of three sand filters is installed to prevent silt from entering the system and is cleaned on a regular back flush cycle.
- One diesel pump that supplies water to the back block irrigation system from the supply channel. The diesel pump also has a filter installed to prevent silt from entering the irrigation system.

Action

An energy audit for the pumping systems evaluated:

- installing variable speed control
- upgrading the pump
- installing a solar photovoltaic system.

Results

Of the energy-saving opportunities evaluated, several initiatives were identified with short-term savings up to 50% and a payback period of 2 years (approx).

Two options for potential energy savings were analysed in the audit report:

- Replacing the 18.5kW centrifugal pump with a higher efficiency model. This option would cost around \$8,000 to implement with a payback period of 2.2 years.
- Installing a variable speed drive to the existing 18.5kW centrifugal pump. This option would cost approximately \$8,000 to implement with a payback period of 2 years.

With the lower payback period, the variable speed drive option is therefore preferred.

The audit report also included the option of installing a solar photovoltaic system to offset some of the pumping energy demand. With a payback period of 5.9 years, this has not been prioritised.

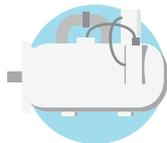
The Irrigators Energy Savers Program is funded by the Queensland Department of Agriculture and Fisheries



Recommendations

The energy audit recommendations are summarised below:

Solution	 Variable speed drive
Est. energy savings (kWh/annum)	16,310
Est. operating cost saving	\$3,980
Est. cost to implement	\$8,000
Payback period (years)	2
Est. demand reduction (kW)	7
Est. energy savings	50%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	\$8,060	\$4,080	-
Cost to implement	-	\$8,000	-
Operating costs for first 3 years	\$24,180	\$20,240	\$3,940
Annual pump operating cost for years 4 to 10	\$8,060	\$4,080	\$3,980
Total pumping costs for 10 years	\$80,600	\$48,800	\$31,800

Farmer feedback

The farm owner has been sourcing quotes to upgrade the electric pump to a variable speed drive unit and assessing the opportunity to install a larger pump and variable speed drive unit to accommodate further expansion of farming activities. Timing for implementation is yet to be confirmed.