

Irrigators Energy Savers Program

targets significant energy savings for a
Queensland horticulture farm

PROPOSED SOLUTION 

Potential energy savings 

Key facts

Farm / Industry

Horticulture

Product

Apples

Location

Cottonvale

Irrigation

Micro irrigation

Pumps

Centrifugal

Solution

Proposed:
Pump replacement

Farm profile

The large apple orchard is located at Cottonvale in the Southern Downs region of Queensland.

Irrigation is via low-pressure sprinklers fed either from a single electric pump or from two diesel pumps. The water supply around the farm is managed by using a series of valves to configure water flow to the desired area.

The main irrigation period is from September to April when pumping is undertaken during peak periods for an average of one hour per day.

Current irrigation

The irrigation system comprises:

- One 50kW belt-driven centrifugal pump that supplies water from the on-site dam to low pressure sprinklers via the PVC distribution system.
- Two portable, diesel-powered centrifugal pumps that move water around the property.

Action

An energy audit of the pumping systems evaluated:

- pump replacement
- piping upgrade.

Results

Of the energy-saving opportunities evaluated, one initiative was identified with potential savings of 56% and a payback period of 8.3 years (approx).

The energy audit report identified that the 50kW pump is oversized for its application, running at poor efficiency and low power factor. A new directly driven pump and motor would provide the same duty with significant energy savings.

The audit report also included recommendations to change the tariff pricing structure and switch to off-peak irrigation times with a combined saving of \$1,200 per year.

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



Recommendations

The energy audit recommendations are summarised below:

Solution	 Pump and motor replacement
Est. energy savings (kWh/annum)	3,500
Est. operating cost saving	\$1,210
Est. cost to implement	\$10,000
Payback period (years)	8.3
Est. demand reduction (kW)	4
Est. energy savings	56%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	\$2,161	\$951	-
Cost to implement	-	\$10,000	-
Operating costs for first 5 years	\$19,449	\$18,559	\$890
Annual pump operating cost for years 6 to 10	\$2,161	\$951	\$1,210
Total pumping costs for 10 years	\$21,610	\$19,510	\$2,100

Farmer feedback

The owner is not planning to implement the audit recommendation due to the long payback period. Replacement of the pump would be subject to equipment failure.

The proposal to review the tariff pricing structure remains under consideration as ongoing use of the electric pump is subject to several factors including rainfall and future irrigation requirements.