

Irrigators Energy Savers Program

targets significant energy savings for a
Queensland turf farm

PROPOSED SOLUTION 

Potential energy savings

24%

Key facts

Farm / Industry

Turf farming

Product

Turf

Location

Beaudesert

Irrigation

Centre pivot

Pumps

Centrifugal

Solution

Proposed:

Variable speed control and pipeline upgrade

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



Farm profile

The turf farm is located adjacent to Allan Creek and the Logan River near Beaudesert in south-east Queensland.

The farm uses centre pivot irrigation, with three pump stations for irrigation and another two for moving surface water around the site to storage dams.

Irrigation occurs year round, with the water transfer pumps operating on an as needs basis, depending on rainfall levels.

Current irrigation

The irrigation system comprises:

- One 30kW portable pump that draws water from the Logan River to supply the main site dam.
- One 7.5kW pump that transfers water from the main dam to another dam on-site.
- Three pumps ranging from 37kW to 55kW that supply the centre pivot irrigators with water from the site dams.

Action

An energy audit of the pumping systems evaluated:

- replacing pumps and motors
- installing variable speed control
- upgrading the distribution line.

Results

Of the energy-saving opportunities evaluated, three initiatives were identified with potential short-term savings of 24% and a payback period of 1.5 years (approx).


The audit report included a recommendation to retrofit variable speed drives to two of the main dam pumps as they have the capability to supply several different centre pivots and so have variable duties. This initiative would contribute significant energy savings in a relatively short period.

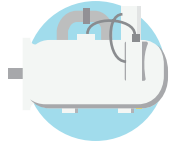
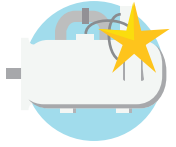

The energy audit report also recommended upgrading the pipelines for the 7.5kW dam transfer pump along with the two main dam pumps. Upgrading from the current 4-inch steel pipes to new 5-inch PVC pipes would reduce head losses and reduce energy usage.



Recommendations

The energy audit recommendations are summarised below:

Solution	 Install variable speed drives and upgrade pipelines
Est. energy savings (kWh/annum)	147,986
Est. operating cost saving	\$41,437
Est. cost to implement	\$63,750
Payback period (years)	1.54
Est. demand reduction (kW)	42
Est. energy savings	24%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual operating cost	\$151,500	\$110,063	-
Cost to implement	-	\$63,750	-
Operating costs for first 2 years	\$303,000	\$283,876	\$19,124
Annual pump operating cost for years 3 to 10	\$151,500	\$110,063	\$41,437
Total pumping costs for 10 years	\$1,515,000	\$1,164,380	\$350,620

Farmer feedback

The farmer considers the energy audit findings made good financial sense and is currently seeking pricing to implement the recommendations to retrofit variable speed drives to the main dam pumps. He noted that being able to irrigate multiple points on the farm and to be assured it is being done the most energy efficiently with the one piece of equipment would be a great advantage. This would be followed by further investigation of the recommendation to upgrade underground pipework across the farm.