

# Irrigators Energy Savers Program

targets significant energy savings for a Queensland beef cattle farm

PROPOSED SOLUTION 

Potential energy savings 

## Key facts

### Farm / Industry

Beef cattle

### Product

Feedlot and grain

### Location

Allora

### Irrigation

Centre pivot

### Pumps

Centrifugal

### Solution

#### Proposed:

Pump and motor replacement with variable speed control

## Farm profile

The feedlot is strategically placed in a water catchment area adjacent to Dalrymple Creek in Allora, south of Toowoomba. There are a number of lots used to cultivate cattle feed, with some lots leased for periods of the year to onion farmers.

The farm uses six pumping stations to supply centre pivot irrigation all year round, with pivots operating on a single rotation per day.

### Current irrigation

The irrigation system comprises:

- Two 37kW centrifugal pumps that supply water to centre pivot irrigators from the creek.
- One 37kW horizontal flow pump that transfers water from the creek to a retention dam on site.
- One 30kW centrifugal pump that supplies surface water to a centre pivot.
- Two pump stations, consisting of three pumps each (ranging from 37kW to 55kW), that supply water from the dam to the irrigators. One pump station is newer and one of its pumps is fitted with variable speed control.

### Action

An energy audit of the pumping systems evaluated:

- replacing pumps and motors
- installing variable speed control.

### Results

Of the energy-saving opportunities evaluated, three initiatives were identified with potential short-term savings of 35% and a payback period of 3 years (approx).

The energy efficiency opportunities included replacing two of the 37kW pumps with new energy-efficient models and variable speed control, as well as retrofitting variable speed drives to the remaining two pumps in the new pump station due to gradients and dual operation of the pump.

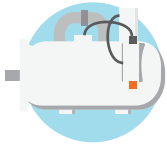
Other possibilities for pump replacement and variable speed drive installation were identified but have long payback periods and will not be prioritised.

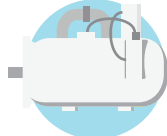


The Irrigators Energy Savers Program is funded by the Queensland Department of Agriculture and Fisheries



# Recommendations

The energy audit recommendations are summarised below:

Solution	 <b>Reduce head losses and optimise pump systems</b>
Est. energy savings (kWh/annum)	55,623
Est. operating cost saving	\$14,782
Est. cost to implement	\$45,000
Payback period (years)	3.04
Est. demand reduction (kW)	19
Est. energy savings	35%

Forecast savings in pump operating costs (approx.)	 <b>Existing system</b>	 <b>Upgraded system</b>	 <b>Reduction in operating costs</b>
Annual operating cost	\$66,454	\$51,672	-
Cost to implement	-	\$45,000	-
Operating costs for first 4 years	\$265,816	\$251,688	\$14,128
Annual pump operating cost for years 5 to 10	\$66,454	\$51,672	\$14,782
<b>Total pumping costs for 10 years</b>	<b>\$664,540</b>	<b>\$561,720</b>	<b>\$102,820</b>

## Farmer feedback & next steps

The farm owner is sourcing quotes to implement the recommendations as well as investigating additional pump control options to manage site peak demand along with the electricity generated from a solar photovoltaic system and back-up diesel generators.