

# Irrigators Energy Savers Program

targets significant energy savings for a Queensland sugar cane farm

PROPOSED SOLUTION 

Potential energy savings

10%

## Key facts

### Farm / Industry

Sugar cane

### Location

Mackay

### Irrigation

Travelling gun

### Pumps

Centrifugal

### Solution

#### Proposed:

Piping modification and install variable speed drive

## Farm profile

The 138 hectare farm, north of Mackay, cultivates sugar cane and uses travelling overhead irrigator guns. The farm is reliant on a submersible pump supplying bore water into a dam and then a high-pressure centrifugal electric pump supplying the travelling overhead irrigator.

### Current irrigation

The irrigation system comprises:

- One submersible pump that draws water from a bore to supply the on-site dam.
- One 45kW centrifugal pump that supplies water from the dam to the travelling overhead irrigator.

### Action

An energy audit of the pumping systems evaluated:

- pump discharge piping modification
- installation of variable speed control
- pump replacements.

### Results

Of the energy saving opportunities evaluated, one initiative was identified, with potential savings of 10% and a payback period of 3.4 years (approx).

The energy audit report identified the potential for modifying the discharge piping on the 45kW centrifugal pump to reduce pressure losses. It was recommended that the discharge piping be replaced with a full radius bend and a non-return valve to reduce backpressure in the line.



Other opportunities that were assessed included replacing the existing pumps with more energy efficient options (paybacks greater than 5 years) and the installation of variable speed control to the irrigator (payback 4.6 years).

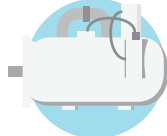


The Irrigators Energy Savers Program is funded by the Queensland Department of Agriculture and Fisheries



# Recommendations

The energy audit recommendations are summarised below:

| Solution                        |  <br><b>Piping modification and install variable speed drive</b> |
|---------------------------------|---|
| Est. energy savings (kWh/annum) | 3,360   |
| Est. operating cost saving      | \$875   |
| Est. cost to implement          | \$3000  |
| Payback period (years)          | 3.4   |
| Est. demand reduction (kW)      | 2.1   |
| Est. energy savings             | 10%   |

| Forecast savings in pump operating costs     | <br><b>Existing system</b> | <br><b>Upgraded system</b> | <br><b>Reduction in operating costs</b> |
|--|--|---|---|
| Annual pump operating cost                   | \$7,222  | \$6,347   | -   |
| Cost to implement                            | -  | \$3,000   | -   |
| Operating costs for first 4 years            | \$28,888   | \$28,388  | \$500   |
| Annual pump operating cost for years 5 to 10 | \$7,222  | \$6,347   | \$875   |
| <b>Total pumping costs for 10 years</b>      | <b>\$72,220</b>  | <b>\$66,470</b>   | <b>\$5,750</b>  |

## Farmer feedback

While the recommendations of the energy audit report would provide potential energy and cost savings, the owner's focus is to implement a capital improvement program that delivers increased farm productivity.

The initial phase of the capital investment has been to purchase a new hard hose travelling irrigator to increase the area of irrigation on the farm. Plans to implement further recommendations are affected by ongoing financial constraints.

The audit has provided the farmer with a list of recommended pumps and drives should the existing ones fail in the meantime.