Irrigators Energy Savers Program

targets significant energy savings for a

south-west Queensland dairy farm

PROPOSED SOLUTION

Potential energy savings 42%

Key facts

Farm / Industry

Dairy

Product

Dairy, bean and grain crops

Location

Brookstead

Irrigation

Centre pivot

Pumps

Centrifugal

Solution

Proposed:
Reduce head losses and optimise pump systems

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

QFF

ERGON ENERGY NETWORK

Queensland Government

Farm profile

The farm is located in Brookstead in the Darling Downs region of south-west Queensland. It produces various crops including sorghum, chickpeas, mung beans, wheat, barley and rye grass, and has around 1,000 head of dairy cattle.

A centre pivot is used for irrigation. Several centrifugal pumps draw water from the site dam, and one draws water from the effluent dam to serve the nearby pivot irrigator or to transfer to the site main dam.

Current irrigation

The irrigation system comprises:

- Four centrifugal pumps (one 37kW and three 45kW) that supply water from the main dam to various different centre pivot irrigators.
- One 45kW centrifugal pump that supplies a centre pivot irrigator from the site effluent dam and can also be used to transfer water from the effluent dam to the main dam.

Action

An energy audit of the pumping systems evaluated:

- reducing head losses
- optimising pumping systems.

Results

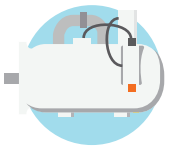
Of the energy-saving opportunities evaluated, three initiatives were identified with potential short-term cost savings of 35% and a payback period of 2.3 years (approx).

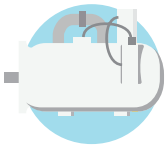
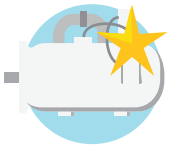
The energy audit report included recommendations to reduce distribution head losses and optimise the pumping systems for the three 45kW main dam pumps. This may involve replacing underground pipework and removing blockages as well as potential pump upgrades and variable speed drive installation to optimise the system. These initiatives will provide significant energy and cost savings over a relatively short payback period.

The report also included a recommendation to reduce head loss, caused by system losses as a result of pipe fouling and/or blockages, and to optimise the 37kW dam pump. This initiative has an estimated payback period of 8.7 years.

Recommendations

The energy audit recommendations are summarised below:

Solution	 Reduce head losses and optimise pump systems
Est. energy savings (kWh/annum)	126,643
Est. operating cost saving	$40,248
Est. cost to implement	$94,500
Payback period (years)	2.34
Est. demand reduction (kW)	120
Est. energy savings	42%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	$144,645	$104,397	-
Cost to implement	-	$94,500	-
Operating costs for first 3 years	$433,936	$407,692	$26,244
Annual pump operating cost for years 4 to 10	$144,645	$104,397	$40,248
Total pumping costs for 10 years	$1,446,452	$1,138,471	$307,980

Farmer feedback

The farm owner has expressed interest in implementing energy-saving initiatives and is investigating the cost to implement the audit report recommendations.

Case studies

To see how other agriculture businesses are saving energy and costs, go to **www.qff.org.au/energysavers**