

Irrigators Energy Savers Program

targets significant energy savings for a Queensland nursery

PROPOSED SOLUTION 

Potential energy savings

60%

Key facts

Farm / Industry

Nursery

Product

Nursery plants

Location

Cabarlah

Irrigation

Drip and micro irrigation

Pumps

Centrifugal

Solution

Proposed:

Lighting replacement, solar photovoltaic installation and insulation of hot water piping

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



Farm profile

The nursery is located in Cabarlah, north of Toowoomba, and cultivates small to medium plants, shrubs and trees for residential and commercial developments.

The irrigation method depends on the type of plant and varies between drip irrigation and small travelling irrigators.

Water is generally sourced from the town mains supply, with irrigation run for two hours per day and continuing year around.

Current irrigation

The irrigation system comprises:

- One main pump station with three identical 5.5kW pumps that supply town water to the irrigation system.
- One dam pump station with a single submersible pump that is currently unused.
- An aerator pump that circulates water through the dam to increase dissolved oxygen.

The hot water system:

- A gas hot water system is used to heat the greenhouses and was set at 50°C during the site inspection.

Lighting systems:

- 100W incandescent lamps
- 11W compact fluorescent lamps
- 5 x 400W high bay mercury vapour lamps.

Action

An energy audit on-site evaluated:

- replacement of lighting
- installing a solar photovoltaic system
- installing hot water pipework insulation.

Results

Of the energy-saving opportunities evaluated, three initiatives were identified with potential savings up to 60% and a payback period of 5.5 years (approx).




The energy audit report recommended replacing the five 400W high bay mercury vapour lamps with 165W equivalents as well as installing a 30kW solar photovoltaic system to offset site energy usage.

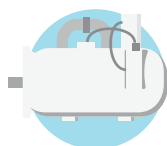
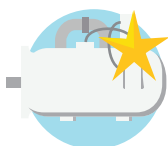

The report also included a recommendation to install insulation on the hot water piping with significant savings in gas energy and a short payback period of 1.1 years.



Recommendations

The energy audit recommendations are summarised below:

Solution	   Lighting replacement, solar photovoltaic installation and insulation of hot water piping
Est. energy savings (kWh/annum)	53,027
Est. operating cost saving	\$10,740
Est. cost to implement	\$59,550
Payback period (years)	5.5
Est. demand reduction (kW)	0.5
Est. energy savings	60%

Forecast savings in operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual operating cost	\$34,299	\$23,559	-
Cost to implement	-	\$59,550	-
Operating costs for first 6 years	\$205,794	\$200,904	\$4,890
Annual pump operating cost for years 7 to 10	\$34,299	\$23,559	\$10,740
Total pumping costs for 10 years	\$342,990	\$295,140	\$47,850

Owner feedback

The owner acknowledged the initiatives identified were appropriate for the nursery. However, operations were consolidated to a Brisbane site and they would cease to operate from the Cabarlah location.