

# 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 was 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).


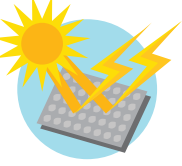

The energy audit report recommended replacing the five 400W high bay mercury vapour lamps with 165W equivalents as well as installing a 30kW solar photovoltaic system to offset site energy usage.

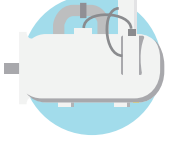
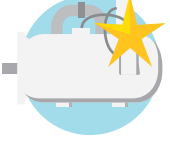

The report also included a recommendation to install insulation on the hot water piping with significant savings in gas energy and a short payback period of 1.1 years.



# Recommendations

The energy audit recommendations are summarised below:

| Solution                        |   <br><b>Lighting replacement, solar photovoltaic installation and insulation of hot water piping</b> |
|---------------------------------|---|
| 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          | <br>Existing system | <br>Upgraded system | <br>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   |
| <b>Total pumping costs for 10 years</b>      | \$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.

This case study was originally developed during 2017-18 as part of the Queensland Government funded Irrigators Energy Savers Program, delivered by the Queensland Farmers' Federation.