

Irrigators Energy Savers Program

targets significant energy savings for a Queensland nursery

PROPOSED SOLUTION 

Potential energy savings

34%

Key facts

Farm / Industry

Nursery

Product

Nursery plants

Location

Mareeba

Irrigation

Drip and micro irrigation

Pumps

Centrifugal

Solution

Proposed:

Install solar photovoltaic system

Farm profile

The nursery is located in the Mareeba area with approximately 1.8 hectares of greenhouse plant production, specialising in seedlings, flowers, natives and shrubs. The irrigation system comprises overhead sprinklers and misting sprays serviced by an electric pump.

The nursery uses mains supply electricity to drive the irrigation water pump, compressor, robotic transplanter, denesting line, tray filler, potting machine, soil blender, workshop lighting and an air conditioner.

Current irrigation

The irrigation system comprises:

- One 25kL storage tank that is gravity fed from Lake Tinaroo via a sand filter to prevent debris entering the irrigation system.
- One UV filter is used to disinfect the water before being distributed to the plants.
- One 5.5kW irrigation pump that supplies water from the storage tank to the irrigation pipework. The pump is controlled by a variable speed drive to keep pressure to the sprinklers at a constant 205kPa.

Action

An energy audit for energy use on site evaluated:

- installation of a solar photovoltaic (PV) system
- upgrading lighting
- checking for leaks in the irrigation system
- checking for leaks in the air compressor system.

Results

Of the energy saving opportunities evaluated, one initiative was identified to install a solar PV system on the shed roof to offset energy consumption with savings of 34% and a payback period of 4.9 years (approx).


Site operations occur during daylight hours and consumption during the night is limited so implementation of a solar PV system would have significant energy and cost saving potential. A solar system of 10kW could generate up to 15,803kWh of usable electricity for the nursery.

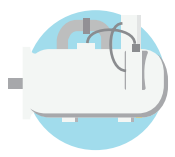
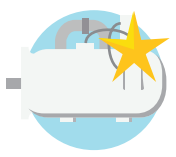

The Irrigators Energy Savers Program is funded by the Queensland Department of Agriculture and Fisheries



Recommendations

The energy audit recommendations are summarised below:

Solution	 Install solar PV system
Est. energy savings (kWh/annum)	15,803
Est. operating cost saving	\$4,036
Est. cost to implement	\$19,800
Payback period (years)	4.9
Est. demand reduction (kW)	10
Est. energy savings	34%

Forecast savings in pump operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual pump operating cost	\$11,990	\$7,954	-
Cost to implement	-	\$19,800	-
Operating costs for first 5 years	\$59,950	\$59,570	\$380
Annual pump operating cost for years 6 to 10	\$11,990	\$7,954	\$4,036
Total pumping costs for 10 years	\$119,900	\$99,340	\$20,560

Farmer feedback

The nursery implemented the report recommendation, installing a 10kW solar PV system in 2015. The owner is pleased with the performance of the system and plans to install an additional 5kW solar PV system.