

Energy Savers Plus Program

targets significant energy savings for a
Queensland horticulture farm

Implemented
Solution 

Actual
energy
savings

25-30%

Key facts

Farm / Industry

Horticulture

Product

Vegetables

Location

Stanthorpe

Irrigation

Drip and micro irrigation

Pumps

Centrifugal

Solution

Implemented:

Pump variable speed control

Farm profile

The farm, near Amiens in Southern Queensland, produces vegetables for supply to supermarkets. The main crops are iceberg lettuce, wombok, celery, broccoli and silverbeet.

The site includes a main packing shed that contains cold rooms, vacuum coolers and ice machines as well as the farm office. All crops grown are quite water-intensive. Pumping is required to supply the large sprinkler irrigation network for most of the growing season from August to May.

Current energy demand

The site energy consumption consists of:

- Main packing shed that houses processing equipment.
- Four vacuum coolers that bring the crops rapidly down to 2°C.
- Six cold rooms with associated refrigeration equipment that stores crops awaiting transport.
- 17 irrigation pumps.

Action

An audit of site energy consumption evaluated:

- variable speed control of pumps and compressors
- pump refurbishment
- refrigeration coil remediation
- solar photovoltaic (PV) installation
- temperature control system improvement
- refrigeration compressor upgrade.

Results

Of the energy saving opportunities evaluated, nine initiatives were identified with potential energy savings of 11% of the site total and a combined payback period of 1.4 years (approx.).

The audit report recommendations included initiatives to install variable speed drives on a 45kW and a 37kW irrigation pump to improve efficiency at lower flow rates as well as refurbishment of the same pumps to resolve lower than expected efficiency.

Other recommendations included installation of a 5kW solar PV system on the main packing shed, remediation of refrigeration coils to address contaminants, implementation of variable speed drives on compressors and upgrade of cold room temperature control system. The energy audit also included a recommendation for an electricity tariff review to realise potential savings of \$24,402 p.a.

Following the audit report recommendations the customer proceeded with installation of variable speed drives on two 37kW pumps on the property that were not originally assessed as part of this energy audit but nonetheless provided opportunity for energy savings. Measurement and verification was completed on these pump systems following implementation and outcomes are shown with associated operating cost savings.

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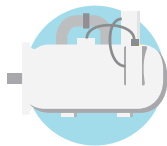
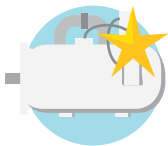




Outcomes

Actual results of energy conservation measures are summarised below:

Solution	Pump variable speed drive installation	
	Pump 1	Pump 2
Est. energy savings (kWh/annum)	15,000	\$18,180
Est. operating cost saving	\$6,639	\$8,046
Est. cost to implement	\$11,730	\$11,730
Payback period (years)	1.8	1.5
Est. demand reduction (kW)	10	5.8
Est. energy savings	25%	30%

Forecast savings in operating costs	 existing system	 upgraded system	 Reduction in operating costs
Annual operating cost	\$249,024	\$234,339	-
Cost to implement	-	\$23,460	-
Operating costs for first 2 years	\$498,048	\$492,138	\$5,910
Annual operating cost for years 3 to 10	\$249,024	\$234,339	\$14,685
total electricity costs for 10 years	\$2,490,240	\$2,366,850	\$123,390

Farmer feedback

Variable speed control of irrigation pumps is now providing energy and cost savings for the customer.

This case study was originally developed in 2018 as part of the Queensland Government funded Energy Savers Plus Program, delivered by the Queensland Farmers' Federation.