

Energy Savers Plus Program

targets significant energy savings for a
Queensland horticulture farm

**PROPOSED
SOLUTION** 

Potential
energy
savings

58%

Key facts

Farm / Industry

Horticulture

Product

Radish, shallots, Chinese vegetables, English spinach, Dutch carrots, iceberg lettuce and assorted herbs

Location

Morton Vale

Irrigation

Drip and micro irrigation

Pumps

Centrifugal

Solution

Proposed: Variable speed control of pumps and solar photovoltaic installation

The Energy Savers Plus Program was funded by the Queensland Department of Energy and Water Supply



Farm profile

The property consists of 28 hectares of farming land located in Morton Vale in the Lockyer Valley and produces a variety of vegetable crops depending on market demand.

The main crops include radish, shallots, Chinese vegetables, English spinach, Dutch carrots, iceberg lettuce and assorted herbs.

The main water supply is gravity fed to a site storage dam where it is then pumped into the irrigation system. Water is delivered to the vegetable crops mainly by a solid set system with sprinklers. The majority of electricity consumption on site is used for pumping and refrigeration.

Current energy demand

The site energy consumption assessed as part of this energy audit consists of:

- Two centrifugal irrigation pumps of 11kW and 22kW as well as a 1.2kW pump that is used to circulate fertiliser in the irrigation system
- Three centrifugal pumps ranging between 1.1kW and 5.5kW that supply the farm residence, sheds and vegetable washing system
- A 0.95kW self-priming centrifugal bore pump is used to supply the processing shed
- Refrigeration system servicing one cold room in the packing shed with 9.3kW input power compressor

Action

The audit of site energy consumption evaluated:

- variable speed control of pumps
- solar photovoltaic (PV) installation
- cold room door seal replacement – removing heat ingress could result in savings of up to 10% for refrigeration.

Results

From the energy saving evaluation, one initiative was identified with potential energy savings of 58% of the site total usage

and a payback period of 4.4 years (approx.).

There is a need on site to construct a new shed to accommodate some equipment that is currently located in the existing shed. The energy audit report recommended installation of a 30kW solar PV system on the new shed roof to offset a large portion of electricity usage on site.

Another initiative investigated in the energy audit was implementation of variable speed control on a 22kW irrigation pump and a 5.5kW vegetable wash pump. However, this initiative has a payback period of 7.7 years, hence considered a longer-term project suiting end of life replacement.



Recommendations

The energy audit recommendations are summarised below:

Solution	 Install 30kW solar PV system
Est. energy savings (kWh/annum)	47,170
Est. operating cost saving	\$8,729
Est. cost to implement	\$38,560
Payback period (years)	4.4
Est. demand reduction (kW)	30
Est. energy savings	58%

Forecast savings in operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual operating cost	\$18,447	\$9,718	-
Cost to implement	-	\$38,560	-
Operating costs for first 5 years	\$92,235	\$87,150	\$5,085
Annual operating cost for years 6 to 10	\$18,447	\$9,718	\$8,729
Total energy costs for 10 years	\$184,470	\$135,740	\$48,730

Farmer feedback

Whilst some of the solutions to our issues were probably well known to us, there were other areas where we weren't up to date on technology that was available to help us, nor the startling amount of wastage if we continue along unchanged. The clarity provided by this audit makes for easy decision making as most initiatives pay for themselves.

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