

Energy Savers Plus Program

targets significant energy savings for a

Stanthorpe Horticulture Farm

POTENTIAL
SOLUTION



POTENTIAL
ENERGY
SAVINGS

15%

Key facts

Farm / Industry

Horticulture

Product

Tomatoes and Salad Greens

Location

Stanthorpe

Case study focus

Cold Rooms

Solution

Install a VSD on the cold room, solar PV, and replace irrigation pump

Summary

A tomato and salad green farm located near Stanthorpe could benefit from recommendations in a recent energy audit. The audit recommended to install a Variable Speed Drive on the cold room, install a solar PV system to offset energy consumption, and replace an irrigation pump.

Farm Profile

The farm, near Stanthorpe, produces tomatoes and salad greens using hydroponics and protected cropping systems. Water is supplied from several on-site irrigation dams which are replenished from rainfall and bores. The farm is expanding the hydroponic and protected cropping areas to make better use of the limited water available.

Current Energy Demand

It is a large site consuming approximately 230,000kWh per year at a cost of \$60,000 across the 3 NMIs that were assessed. The farm has already invested in solar with a 6kW system installed on the packing shed to help offset electricity costs.

The infrastructure contributing to the energy consumption onsite consists of:

- Two cold rooms
- A main 15kW pump
- A smaller 5kW hydroponic circulating pump
- Large packing shed consuming 55,000kWh/year

Action

The energy audit recommended the following changes to improve efficiency and reduce costs:

- Tariff analysis,
- Installation of a 12kW solar system,
- Replace 15kW main pump with a more efficient unit,
- Maintenance on the cold room condenser and evaporator, and general management changes, and
- Installation of a 45kW Variable Speed Drive on the cold room with new insulation and door seal.

The Energy Savers Plus Program Extension is funded by the Queensland Department of Energy and Public Works.



Results

Of the energy saving opportunities evaluated, 3 initiatives were identified with potential energy savings of 15% of the site total, a combined payback period of approximately 5.5 years and emission reductions estimated as 27.1 tCO₂-e per year.

The farm has two large cold rooms on site consisting of a smaller quick-cool room and a larger storage room which are both served by one unit. When the cold rooms were installed, they were designed for a cool down and storage of different vegetables down to 20 degrees Celcius. The current crop of tomatoes being grown on the farm requires a temperature of 5 to 7 degrees Celcius, so it was recommended to install a Variable Speed Drive (VSD) on the existing unit to better manage the different load requirements and improve the life span of the compressor. This recommendation has a payback period of 4.5 years.

Other recommendations included installing an additional solar system at the main packing shed which already has a 6kW system. A further 12kW was suggested which had a payback period of 7.3 years.

The main 15kW pump was tested and found to be performing below its design capacity and was achieving an efficiency of 65-68%. By replacing the pump with an appropriately sized kW pump with an efficiency of 80% or higher, a payback period of 4.8 years is achievable.

A tariff analysis was completed on the sites tariffs and it was found that there were potential savings of approximately \$2,500 per year by changing the tariff at the main packing shed which consumes 55,000kWh/year. The shed was on tariff 62, which is a farming Time of Use tariff being phased out in July 2021. It was recommended to change to Tariff 20S which is a flat rate tariff used for small businesses.

Outcomes/Recommendations

The energy audit recommendations and potential benefits are summarised below:

Solution	VSD on cold room	12kW solar system	Replace main pump
Estimated Cost to implement (\$)	17,000	20,000	11,000
Annual Energy Savings (kWh)	11,000 (5%)	10,000 (4%)	13,000 (6%)
Annual operating cost savings	\$3,700	\$2,700	\$2,300
Payback Period (years)	4.5	7.3	4.8
Annual Emission Savings (tCO ₂ -e)	8.99	7.82	10.28

The grower reviewed the audit report and will consider the recommended upgrades in their future business planning.

Energy Audits for your Business

An energy audit is a great way for a business to identify the most effective way to cut costs, reduce emissions and boost productivity. Additional benefits from the installation of a real time energy meter are expected, such as time savings, framed under the following QFF Program www.qff.org.au/blog/real-time-energy-meters/

See other case studies including sector case studies and technology case studies at the website: www.qff.org.au/newsroom/case-studies/

