

Energy Savers Plus Program

targets significant energy savings with

Solar Systems

POTENTIAL SOLUTION



AVERAGE ENERGY SAVINGS

14%



Key facts

Farm / Industry

All

Product

Solar PV

Location

Queensland

Case study focus

Solar PV 5-100kW

Solution

Install correctly sized solar PV

Summary

The Energy Savers program aims to assist farmers to reduce energy costs by supporting the accelerated adoption of improvements in on-farm energy use. This case study summarises the Solar System recommendations from 180 audits across the nine agricultural sectors.

The total energy consumption recorded from the 180 farms was 18,666,737kWh, at an annual cost of \$4,187,148, resulting in emissions of 15,120 tonnes of CO₂. Various technology types were identified in the program aimed at improving efficiency onsite.

An energy audit is a good investment

An energy audit is a great first step in moving farming industry towards a more efficient future by reducing energy use, costs, and Carbon emissions onsite. The solar options were separated into the following headings:

Solar systems- ranging in size from 5-100kW. Of note 42 of the 140 solar systems discussed were 30kW due to the increased costs surrounding the network connection standards.

Solar and Batteries- Grid connect and standalone can be viewed at

Table 1. Total Recommendations and Savings for Solar Technology Adoption.

Recommendation	Total	Energy Savings (kWh)	Cost Savings (\$)	Capital Cost (\$)	Average Payback (Years)	Emission Reduction (t/CO ₂ -e)
Solar Systems 5-100kW	140	2,646,573	856,621	3,809,997	5.9	2,144
All Findings	671	7,459,014	3,044,332	12,784,670	6.6	6,042
Comparison (%)	21	35	28	30	93	37

From the recommendations in the 180 audits, total potential grid energy savings of 2,646,573kWh were identified with the use of Solar PV systems. Including production benefits, a saving of \$856,621 and estimated 2,144 tonnes of CO₂-e could be realised per annum. At a capital cost of \$12,784,670 the average payback was 6.6 years.

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Table 2. Pre and Post Audit Metrics.

Metric	Pre-Audits	Post-Audits	Reduction (%)
Energy Consumption (kWh)	18,666,737	16,020,164	14
Energy Costs (\$)	4,187,148	3,330,527	20
Emissions (CO ₂ -e)	15,120	12,796	14

As installation of the technology is made measurement and verification will take place. The energy savings from the process will be tabled and compared against the total number of farms in the program.

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.

Note:

To avoid over capitalising on Solar PV it is recommended to become as efficient as possible with the implementation of new technology then sizing the system to suit.

Next Steps

Look to improve energy efficiency on farm by taking action with a regular maintenance plan, quick wins or by conducting a full energy audit that adheres to Australian Standard AS:3598 and implementing new efficient technology.

Some quick wins to reduce consumption and costs to become more efficient include:

- Regularly dust electrical motors and lights.
- Turn off electrical equipment when not in use
- Minimise irrigation fittings and bends.
- Remove trash from pump inlets and clean filters.
- Utilise solar generation effectively by monitoring with a real time energy meter.



This case study was originally developed in 2021 as part of the Queensland Government funded Energy Savers Plus Program Extension, delivered by the Queensland Farmers' Federation.