Energy Savers Program

targets significant energy savings with

Pumps and Irrigation

POTENTIAL SOLUTION

AVERAGE ENERGY SAVINGS 16%

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 pumping and irrigation recommendations from 180 audits across the nine agricultural sectors.

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

Key facts

Farm / Industry

All

Location

Queensland

Case study focus

Pumps and Irrigation

Solution

Install and maintain efficient pumps and alter irrigation systems

An energy audit is a good investment

An energy audit is a great first step in moving farming industries towards a more efficient future by reducing energy use, costs, and carbon emissions onsite. This category includes the following technology solutions to improve efficiency on pumping and irrigation systems on farm.

- Pump and or motor replacement-new efficient pumps matching the required duty points.
- Install Variable Sped Drive (VSD)-installation of VSD only on existing pumps.
- Pump replacement with Variable Speed Drive - new efficient pump and motors including a VSD
- Pump maintenance- dusting of motors, new capacitors and pump alignments.
- Irrigation changes- mainline and suction pipe upgrades, design changes, new irrigation types (e.g. Low Pressure Booms).

Table 1. Total Recommendations and Savings for Pump and Irrigation Technology Adoption.

Recommendation	Total	Energy Savings (kWh)	Cost Savings ($)	Capital Cost ($)	Average Payback (Years)	Emission Reduction (t/CO2-*e*)
Pump Replacement	108	1,283,203	422,971	1,937,287	10.3	1,039
Install VSD	61	619,569	182,306	670,549	6.5	502
Pump and VSD	18	307,693	96,839	406,566	16.9	249
Pump Maintenance	12	53,964	16,584	96,128	3.8	44
Irrigation Changes	71	757,959	712,522	3,103,117	5.6	614
Total	270	3,022,388	1,431,252	6,213,637	8.6	2,448
All Findings	671	7,459,014	3,044,332	12,784,670	6.6	6,042

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

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From the 270 recommendations in the 180 audits total energy savings of 3,022,388kWh were discovered with the use of Pumping and Irrigation upgrades. Including production benefits, a cost saving of $1,431,252 and estimated 2,448 tonnes of CO2-*e* could be realised per annum. At a capital cost of $6,213,637 the average payback was 8.6 years.

Table 2. Pre and Post Audit Metrics.

Metric	Pre-Audits	Post-Audits	%Reduction
Energy Consumption (kWh)	18,666,737	15,644,349	16
Energy Costs ($)	4,187,148	2,755,896	34
Emissions (CO2-e)	15,120	12,672	16

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.

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 include:

•Regularly dust electrical motors and lights.

•Turn of electrical equipment when not in use

•Remove trash from pump inlets and clean filters.

•Minimise irrigation fittings and bends.

•Utilise solar generation where possible to irrigate using Energy monitoring and demand management.

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.