Energy Savers Plus Program

targets significant energy savings for

Queensland Dairy Farms

POTENTIAL SOLUTION

AVERAGE ENERGY SAVINGS 41%

Key facts

Farm / Industry

Dairy

Product

Milk, Milk Solids & Feed

Location

Queensland

Case study focus

Industry and technology

Solution

Install solar systems, HVAC, LED lighting, and efficient pumps and irrigation systems.

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 outcomes from audits conducted on 30 Queensland Dairy farms.

Collectively the total energy consumption consumed from the measured areas on the 30 farms was 2,147,720kWh at an annual cost of $541,937, resulting in emissions of 1,975 tonnes of CO2-*e*.

Opportunities

The main opportunities identified on Dairy farms include:

- **Pumping and Irrigation**- Savings from Variable Speed Drive (VSD) installation, pump replacements and maintenance. Changes to irrigation design and automation.
- **Heating Ventilation and Cooling** (HVAC)- Cooling upgrades, condenser motors with VSD, ventilation fans and heating upgrades.
- **Lighting and General**- Replacement and retrofitting of lights with LEDs, infrastructure and general changes.
- **Solar and Batteries**- Grid connect and standalone
- **Gas**- Solar hot water, insulation and general heating.
- **Solar Systems**- Ranging in size from 5-100kW systems.

Table 1. Technology Recommendations and Savings in the Poultry Industry.

Recommendation	Total	Energy Savings (kWh)	Cost Savings ($)	Capital Cost ($)	Average Payback (Years)	Emission Reduction (CO2-e)
Pumping and Irrigation Upgrades	42	397,599	319,943	1,537,627	5.1	322
HVAC	57	350,371	94,715	390,173	4.8	284
Lighting and General	44	91,845	36,437	75,415	2.8	74
Solar Systems	17	48,379	82,388	412,500	6.3	39
Total	160	888,194	533,483	2,415,715	4.7	719
Total Recommendations	665	7,459,015	2,817,342	12,784,670	6.85	6,042

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

QFF

Queensland Government

QDO

Table 1 highlights that total energy savings of 888,194kWh were discovered from the audit process.

Including production benefits, a saving of $533,483 and estimated 719 tonnes of CO2-*e* could be realised per annum. At a capital cost of $2,415,714 the average payback was 4.7 years.

Additional value adding from the energy audits showed how an increase in water delivery, could increase production and profit with a reduction in energy consumed per unit of output.

Table 2. Pre and Post Audit Metrics.

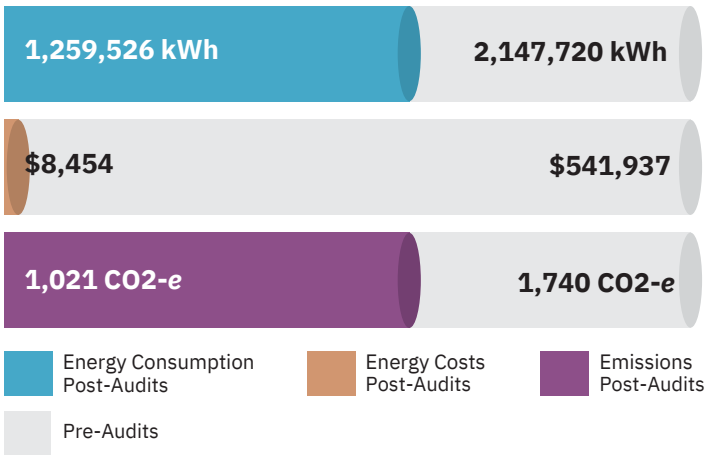
Metric	Pre-Audits	Post-Audits	%Reduction
Energy Consumption (kWh)	2,147,720	1,259,526	41
Energy Costs ($)	541,937	8,454	98
Emissions (CO2-e)	1,740	1,021	41

As installation of the recommendations is made within the industry, measurement and verification will be undertaken, and case studies will be updated to include the actual energy savings.

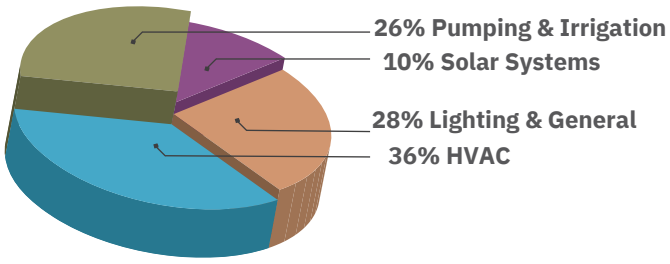
Energy Audits for your Business

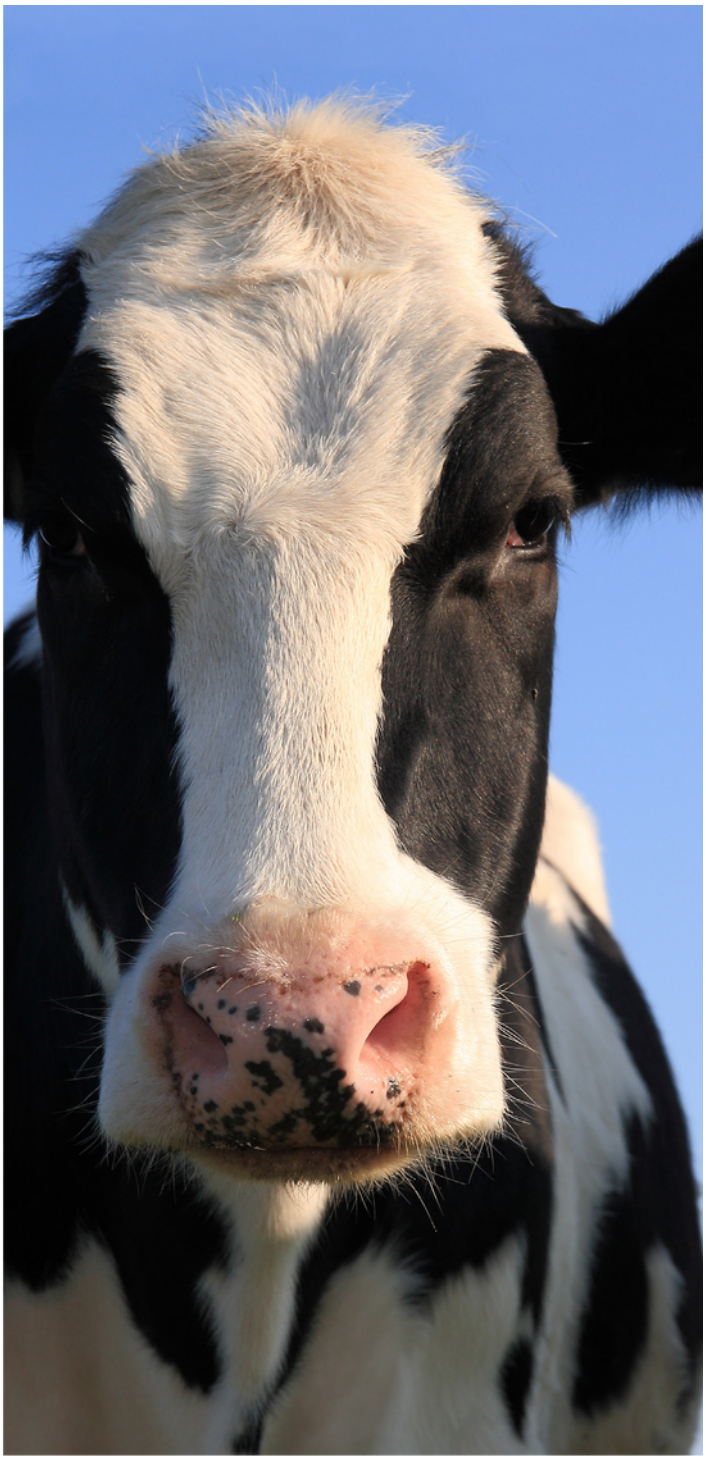
An energy audit is a great way for a business to identify the most effective way to cut costs, reduce emissions and boost productivity.

Graph 1: Energy Savings Pre vs Post Audits



Graph 2: Energy Saving Opportunities in dairy





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.