

# Energy Savers Plus Program

targets significant energy savings for a  
Queensland beef cattle farm

PROPOSED SOLUTION 

Potential energy savings 

## Key facts

### Farm / Industry

Beef cattle

### Product

Feedlot

### Location

Condamine

### Solution

**Proposed:** Thermal system optimisation, transformer voltage optimisation and lighting upgrade

**Implemented:** Tariff change

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



## Farm profile

The site in Condamine is a beef cattle feedlot strategically located close to cattle supply areas and processing plants. The facility focuses on operational efficiency and was the first feedlot in Australia to implement a batch box feeding system.

The on-site mill plant stores various types of grain in silos before it is wetted to increase moisture content. Grain is cooked in steam chests where moisture content is further increased. Finally, the grain is cracked open by mill rollers and mixed with other rations such as vegetable oil and cottonseed to feed cattle.

The site includes a hospital and induction facility where cattle are introduced to site, as well as staff and contractor accommodation.

### Current energy demand

The site energy consumption consists of:

- Five mill motors that range between 30kW and 55kW.
- Other small motors that range between 0.18kW and 4kW.
- Two LPG boilers (2MW and 3MW) that supply steam to the plant.
- Three 7.5kW air compressors.
- Two 15kW hydraulic power packs that operate the crusher and gates for the induction facility.
- Two bore pumps.
- General lighting, office and air conditioning loads.
- Staff and contractor accommodation buildings.

### Action

An audit of site energy consumption evaluated:

- installation of boiler economiser
- optimisation of transformer voltage
- molasses tank modification
- lighting upgrade
- optimisation of boiler combustion O<sub>2</sub> levels
- solar photovoltaic (PV) installation

- vegetable oil solar heating
- variable speed control on motors
- thermal insulation of pipework.

### Results

Of the energy-saving opportunities evaluated, five initiatives were identified with potential energy savings to electricity consumption of 8% and site LPG consumption of 13%, with a combined payback period of 1.3 years (approx).

The energy audit report recommendations included initiatives to install a boiler economiser to use waste heat from the exhaust stack to preheat boiler feedwater as well as optimisation of boiler combustion O<sub>2</sub> levels to reduce wastage of fuel gas.

The recommendations also included optimisation of transformer voltage to the mill plant by changing tap settings, and modifying the molasses storage and mixing equipment to reduce heating requirements as well as upgrading lighting to energy efficient LEDs.

Other initiatives from the energy audit had payback periods exceeding 3 years which is above the customer defined economic threshold.

A tariff change could result in potential savings of over \$72,000 per annum.

# Recommendations

The energy audit recommendations are summarised below:

Solution	 <b>Electrical savings:</b> transformer tap change, molasses storage tank modifications and lighting upgrade	 <b>Gas savings:</b> boiler economiser and combustion O <sub>2</sub> optimisation
Est. energy savings (per annum)	102,038kWh	3,239 GJ
Est. operating cost saving	\$24,149	\$53,328
Est. cost to implement	\$32,824	\$66,099
Payback period (years)	1.4	1.2
Est. demand reduction (kW)	28	-
Est. energy savings	8%	13%

Forecast savings in operating costs	 Existing system	 Upgraded system	 Reduction in operating costs
Annual operating cost (including electricity and LPG costs)	\$1,311,000	\$1,233,523	-
Cost to implement	-	\$98,923	-
Operating costs for first 2 years	\$2,622,000	\$2,565,969	\$56,031
Annual operating cost for years 3 to 10	\$1,311,000	\$1,233,523	\$77,477
<b>Total energy costs for 10 years</b>	<b>\$13,110,000</b>	<b>\$12,434,153</b>	<b>\$675,847</b>

## Farmer feedback

The feedlot owner began implementing the recommended tariff change soon after audit completion in 2015, with implementation of energy-saving initiatives to follow.