Case study:
Gold Coast Tiger Prawns

We're always looking for ways to help customers save. This case study shows how a prawn farmer reduced electricity running costs by approximately $40,000 per year and we'd like to share their results with you.

Gold Coast Tiger Prawns (GCTP) is one of Australia's largest black tiger prawn farming operations. Based in Woongoolba, with an annual production capacity of approximately 1,000 tonnes, electricity use is dominated by a large number of motors ranging in size from 0.37kW up to 55kW. These motors drive pumps for transferring water, paddle wheels to aerate the ponds, and conveyor belts in the processing and sorting factory.

Early in 2015, GCTP discovered that Network electricity tariffs were going to change to include a kVA demand charge. This demand charge would increase the cost of electricity for the property. GCTP engaged Energy Correction Options to review its electricity costs. Two areas were identified with potential for savings - Power Factor Correction (PFC) and Variable Speed Drive (VSD) motors.

Savings Snapshot

By focusing on two areas of concern substatial savings were achieved

Variable Speed Drives (VSDs)

Installed VSDs on main pumps and belt conveyors

Power Factor Correction (PFC)

Installed PFC on all grid connection points

By switching to variable speed pumps and installing power factor correction equipment GCTP will reap the financial benefit for years to come!

Forecast electricity running cost savings of approximately

19%*

* Electricity savings are from an independent auditor's measurement and verification report conducted in 2015

Money Saving Choices

Power Factor Correction (PFC) equipment

Investigations revealed the power factor (PF) across various electricity grid connection points at maximum demand was dropping to near 0.8. The general requirement is for PF to be 0.9 or better.

Capacitor banks totalling 775 kVAr were installed at seven locations where high voltage power was distributed and stepped down for use across the property. The PFC panels were fitted with visible external alarms to alert farm operators if the units tripped and went into bypass mode so a service call could be arranged.

Variable Speed Drives

GCTP also upgraded a number of motors with VSDs, focusing on those motors with variable flow requirements. The largest VSDs were installed on the 55 kW harvesting pumps which extract water and prawns from ponds for processing. The VSDs allowed the pumps to maintain a constant water level in the collection drains without the need for stopping and starting all the time which causes wear and tear on motors.

PF was improved at maximum demand to up to 0.98. This resulted in a reduction of up to 340 kVA or approximately 20% of total kVA, and delivered electricity cost savings of up to $3,400 per month in demand charges.

Electricity grid connection	Capacitor banks installed (kVAr)	Maximum demand reduction (kVA	Previous PF at maximum demand	New PF at maximum demand	Maximum demand reduction
1	625	271	0.82	0.97	19%
2	75	34	0.89	0.98	19%
3	75	35	0.84	0.98	21%

Improvements in PFC across electricity grid connection points

A number of much smaller VSDs were also installed in motors attached to conveyor belts in the processing plant. These motors ranged in size from 0.37 kW up to 1.5 kW. The VSDs allowed the belt speed to be adjusted during sorting and inspection according to the volume of prawns being processed at the time. The slow start up experienced with VSDs also reduced belt strain.

By upgrading their motors with VSDs GCTP improved the performance of their operation, reduced wear and tear on their equipment, and delivered electricity cost savings.

This case study was produced for the Energy Savers Plus Program to help farmers in the Ergon and Energex areas improve energy efficiency.

Contact a Trade Ally Network (TAN) member

If you'd like to explore energy efficiency and demand management opportunities, you might like to contact a TAN member at ergon.com.au/TANsearch

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