DPI Farm Energy Forum 2019

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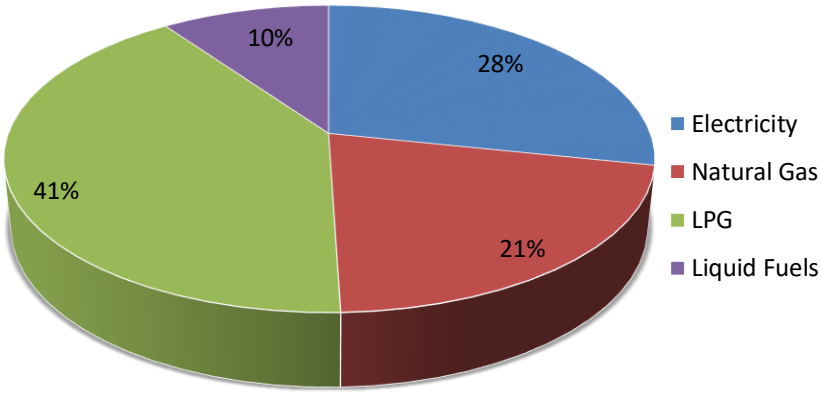
Rivalea AUSTRALIA

About Rivalea

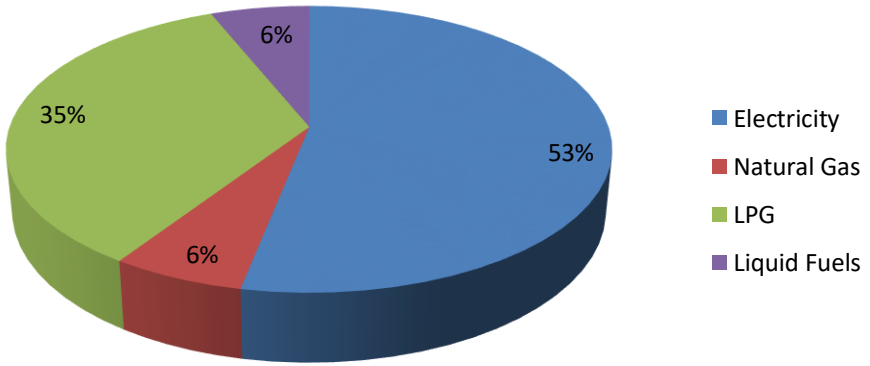
- Rivalea is one of Australia's leading integrated agri-food companies.
- The company operates across a number of sites that include farming, processing and distribution.

Rivalea Energy mix

Energy use by fuel type

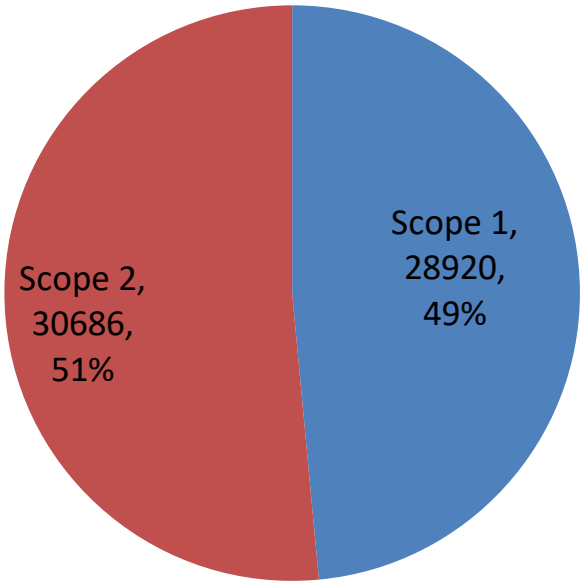


Energy use by cost

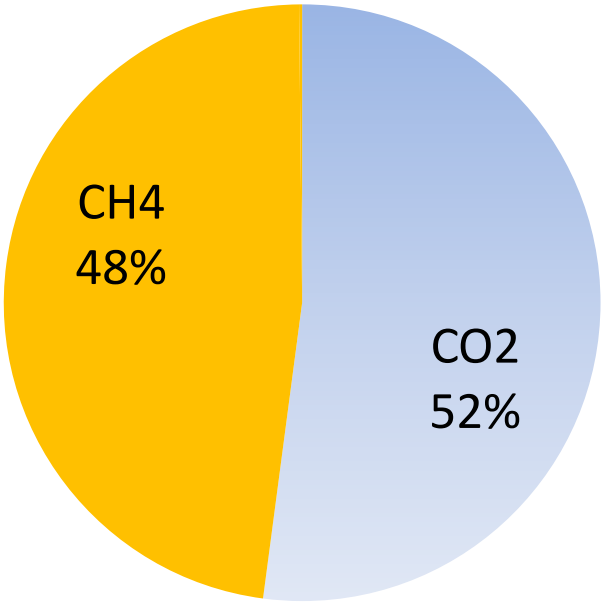


National Greenhouse Energy Report

Rivalea group of companies Greenhouse emissions



Emissions by Source



Managing our carbon footprint

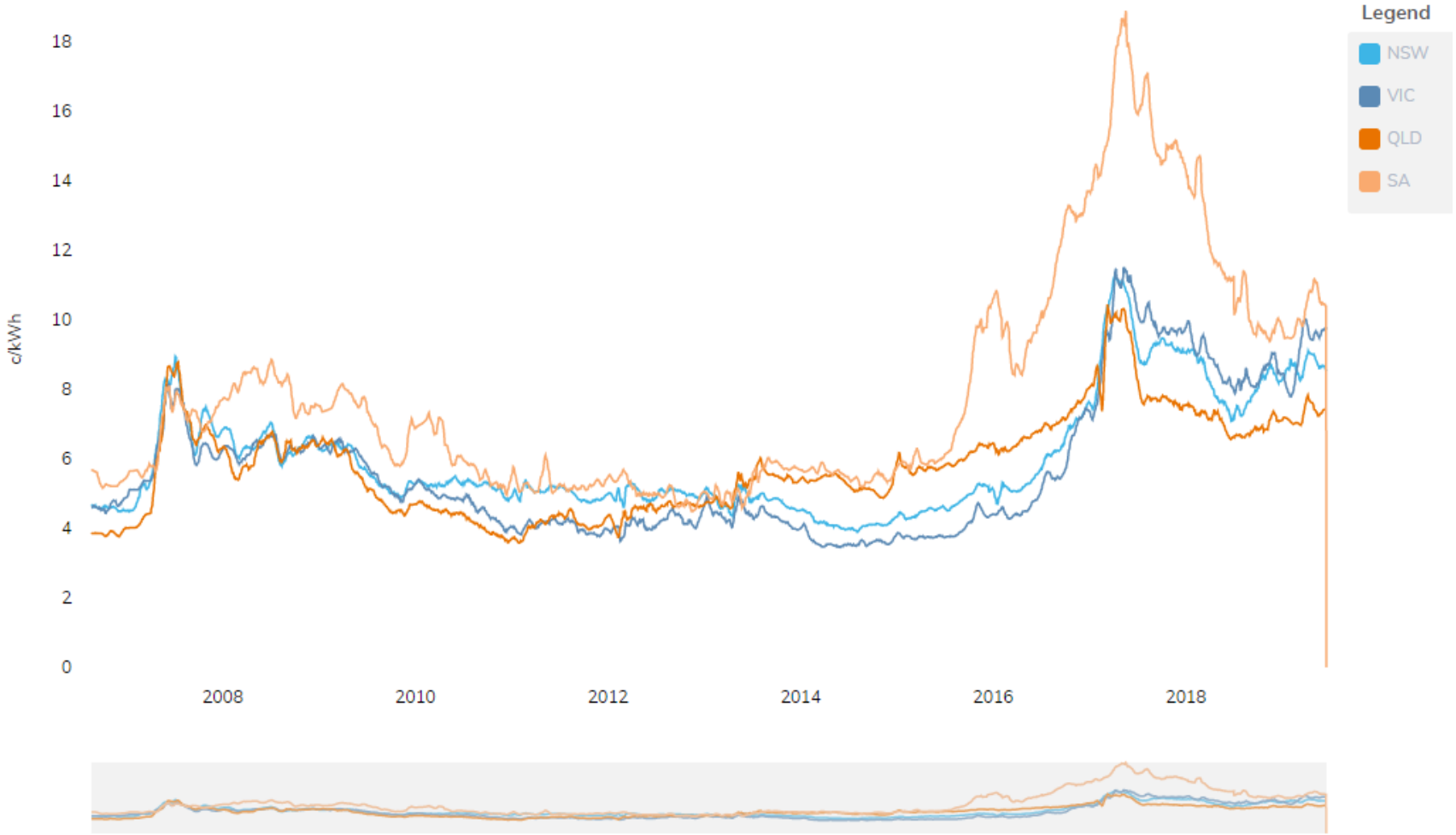
Rivalea is committed to sustainable farming practices including reducing our carbon footprint.

Methane is a potent greenhouse gas (25 times that of CO2) and makes up the vast majority of carbon emissions from on farm piggery waste water treatment ponds.

Rivalea has three covered anaerobic ponds that capture the methane and recover valuable energy while vastly reducing the global warming impact.

The Rivalea projects have avoided 120,000 tonnes of CO_2-$_{eq}$ emissions up to 2019.

Energy Market



http://www.energyaction.com.au/energy-procurement/energy-action-price-index

Rivalea Biogas journey

- 1995-2009 – 4 attempts at PPA
- 2011 – Small covered pond with APL grant 15,000 pig site covered pond (CFI Project)
- 2012 Module 5 Covered pond 45,000 pig site (CFI/ERF Project)
- 2019 Module 3&4 – 75,000 pigs
- 3 x 500 kVA generators
- 125,000 tonnes of CO2-eq avoided since 2012
- Emissions Reduction Fund Projects

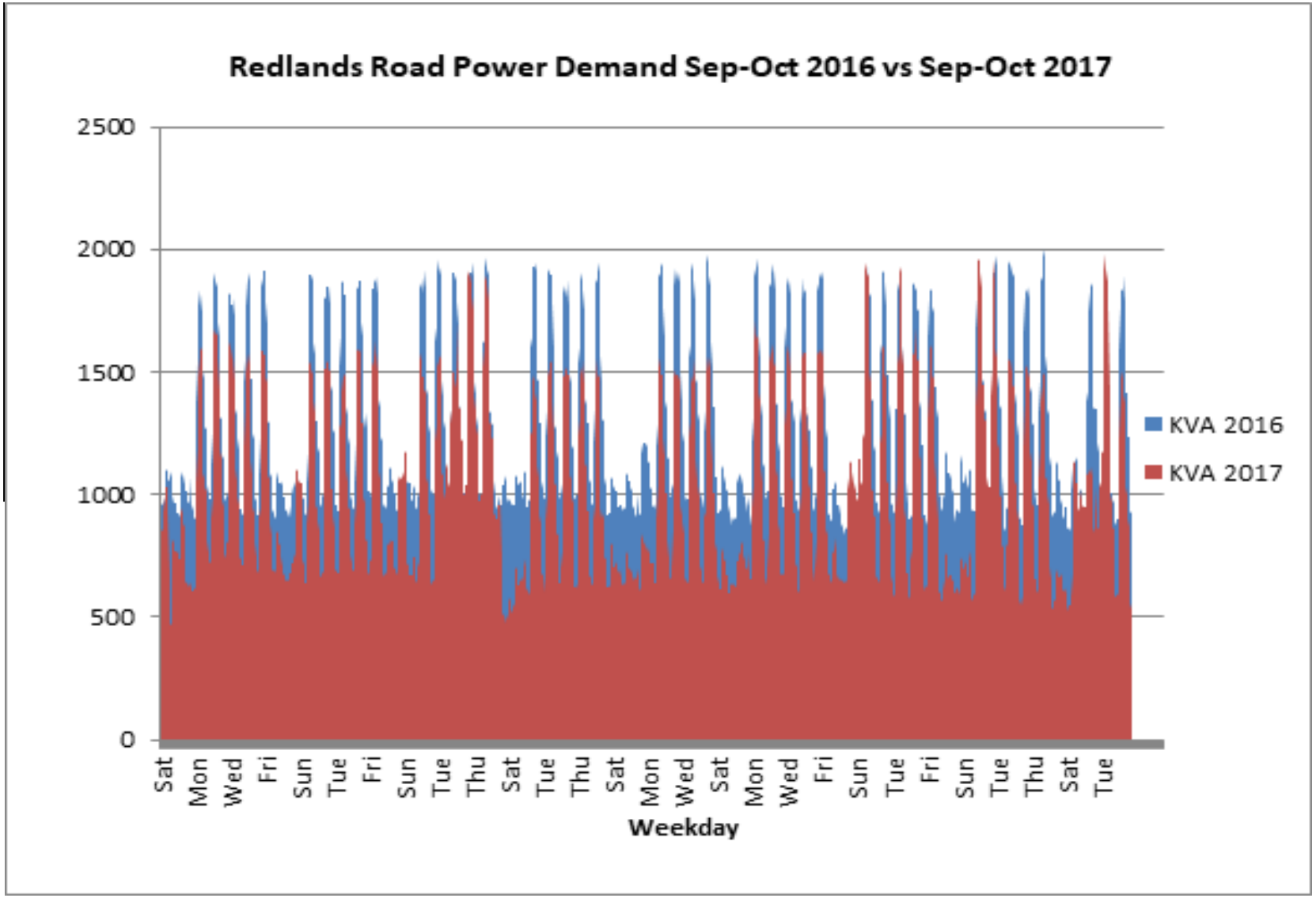
Module 5 Biogas Plant

- 50ML capacity
- 7000m^2 surface area
- 2ML of effluent per day
- 1.8 million m^3 biogas p.a.
- 18,000 tonnes of CO2 equivalent avoided emissions per annum
- 2 x Flares 400m^3/hour
- Emissions Reduction Fund
- Commissioned November 2012

First Combined Heat and Power Unit – Commissioned April 2017

- COMBINED HEAT AND POWER UNIT
- · 500 kW electrical output
- · 500 kW thermal output (hot water)
- · 4000 MWh annual output
- · Covers approximately 25% of site energy
- · Manufactured by 2G Energietechnik AG
- Heek, Germany
- · Eligible for Renewable Energy Credits
- Commissioned April 2017

CHP Performance

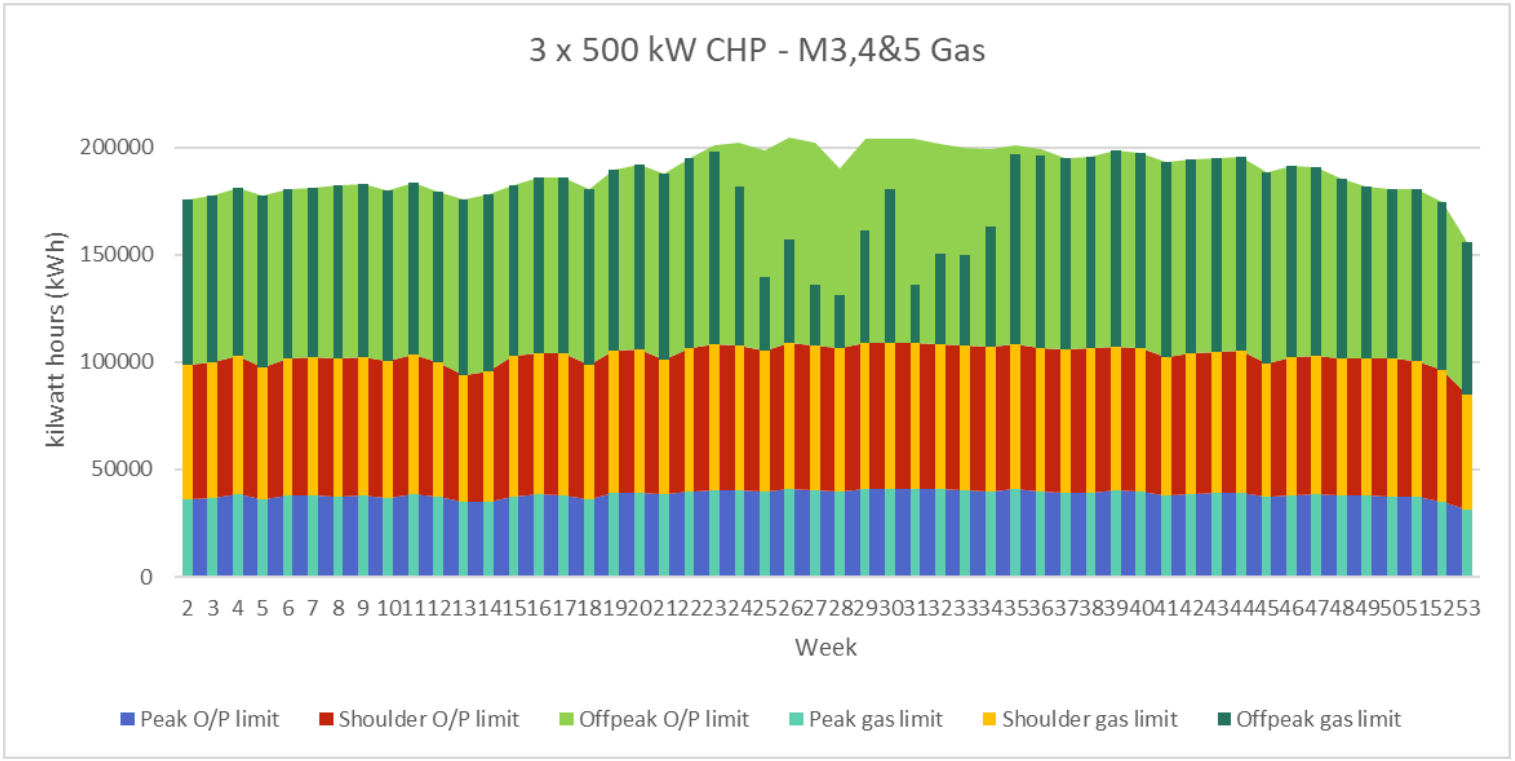


Stage 3 – New pond and more generators

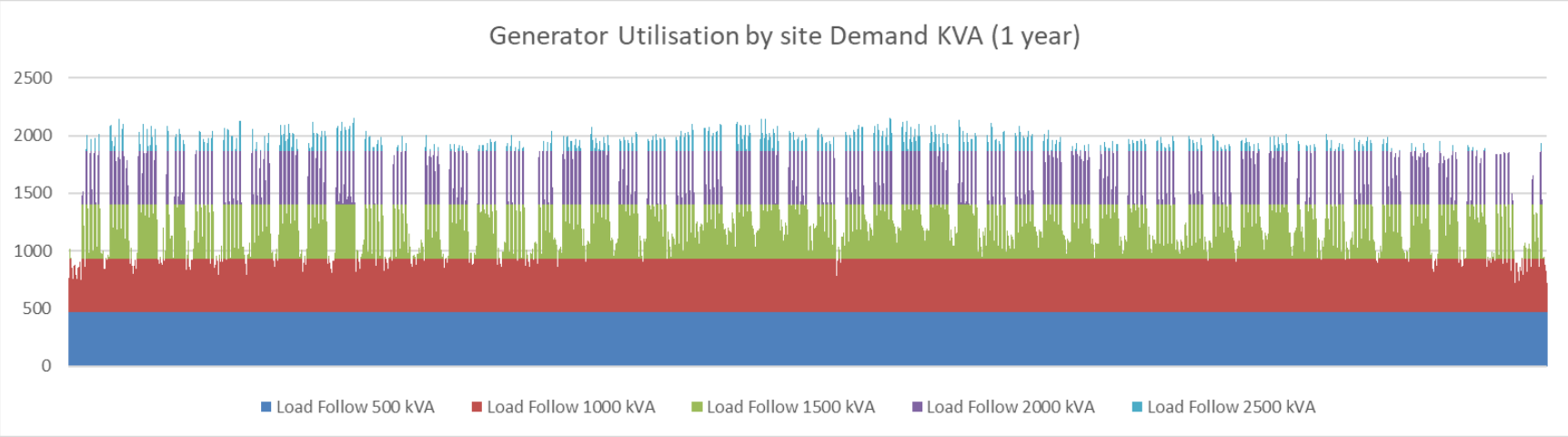
- A new 75 ML covered anaerobic lagoon with effluent sourced from Modules 3&4 (piggeries)
- 2 new 500 kW CHPs (in addition to the existing generator)
- A biogas scrubbing treatment plant
- Gas interconnection between the two lagoons
- Upgraded electrical distribution infrastructure

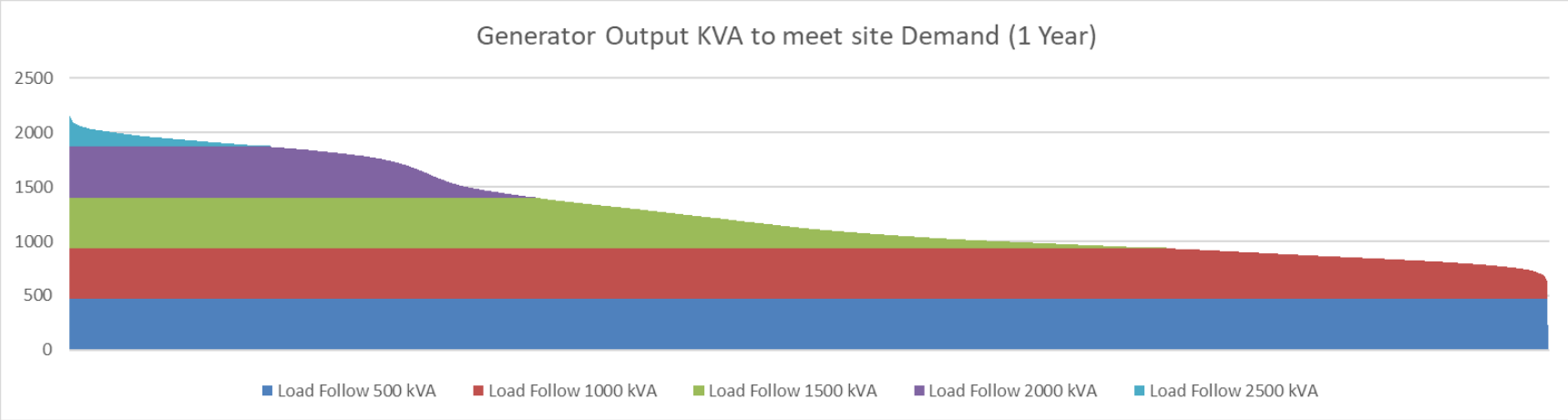
Sizing Generators– kWh

- Generators needed to fit both onsite demand and biogas production profile
- Both profiles are seasonal – out of sync
- Both demand and consumption to consider



Demand Profile





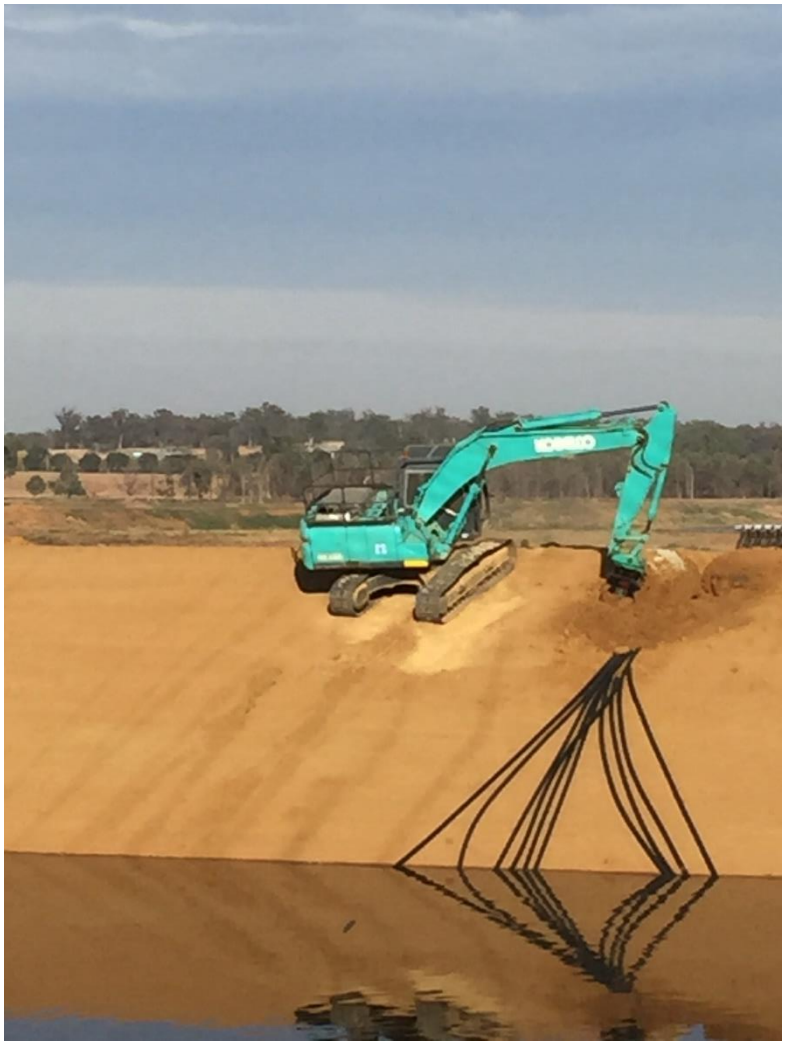
Economics

Capital	
Module 5 covered pond	$700 K
3 x CHP Units	$2950 K
Module 4 Covered pond	$2200 K
Total	$ 5.85 million
Income p.a	
Energy Saving	$1500 K
Demand Charges	$220 K
RECS	$200K
ACCUS	$340K
	$ 2.26 million
Simple Payback	<2 years
IRR	21.3%

Module 4 & 5

Pond Construction

Sludge Circulation Pipes



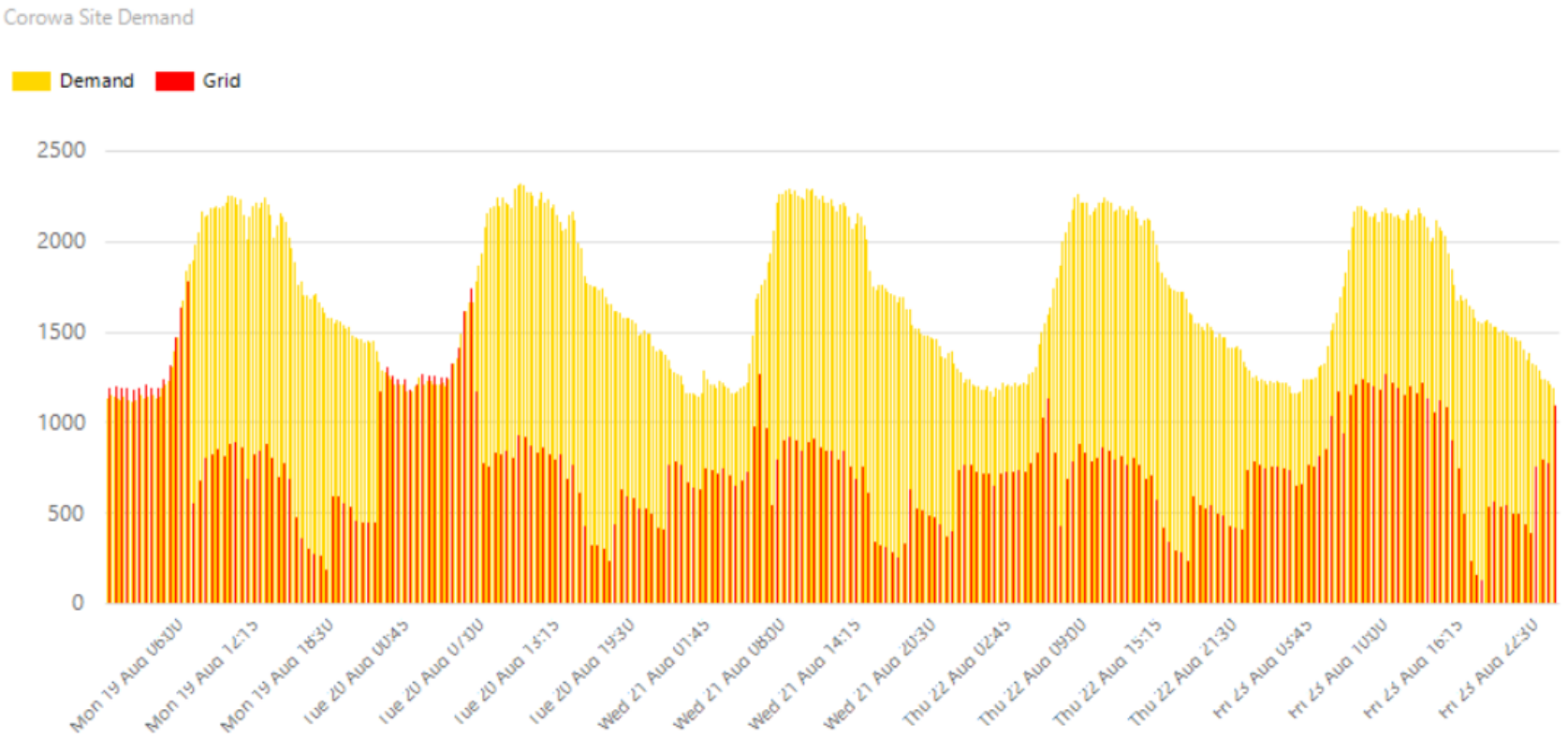
Almost full after 4 weeks

Cover Construction

Module 4 –Covered Pond

CHP

Generator Performance



Future

- Lagoon Heating – increase biogas production in winter
- Additional ponds
- Gas upgrading to biomethane (pipeline quality natural gas)
- Gas compression
- Co digestion of imported materials

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AUSTRALIA

THANK YOU