

# PigGas Report 7 – 4,300 sow, farrow to finish, conventional piggery, NSW.

September 2013

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## Production details

This is a large corporate conventional piggery, with breeding and growing pigs on one site in nineteen naturally ventilated sheds. Pigs are sold as both light and heavy finishers at approximately 100 kg and 120 kg live weight.

## Feed consumption

Some feed grain is grown on-site with majority of feed purchased off-site and milled off-site. Normal piggery cereal-based feedstuffs are supplemented with waste by-products from other industries with total feed consumed at 21,835 t/yr.



## Sales/Tranfers

63,255 pigs/yr are sold with a total dressed weight of 4,966 t/yr.

## Waste management systems

Manure is automatically flushed from each shed in underfloor drains to a collection sump. From there, effluent is gravity fed directly to the primary anaerobic lagoon which has been covered to collect and flare biogas. The project qualifies under the Carbon Farming Initiative Methodology “Destruction of methane from manure in piggeries”. Effluent from the covered lagoon flows through polishing ponds.

## Manure reuse systems

Effluent from the pond system is spray irrigated to land. Crops grown to reuse nutrients include barley, wheat, lupins, maize and lucerne. Approximately 3% of total nutrients are exported from the site in dried pond sludge. Cattle and sheep are also grazed on pastures. Approximately 2,500 ha of land are used for cropping and grazing.



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## On-Farm Baseline Emissions

Prior to covering the anaerobic lagoon and flaring biogas, the on-farm emissions for the piggery were **23,976 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **4.83 kg CO<sub>2</sub>-e/kg HSCW**.

The current baseline emissions for this piggery with its covered anaerobic lagoon, biogas capture and flaring total **7,692 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **1.55 kg CO<sub>2</sub>-e/kg HSCW**.

## On-Farm Emissions Reduction Scenario

A viable option on this piggery to further reduce emissions is to install an electricity generation plant with engines running on biogas. Excess electricity generated can be fed into the state power grid. Waste engine heat can also be collected to heat water for recirculation through the farrowing and weaner sheds to replace all LPG heating.

This scenario (see table below) reduced on-farm emissions **from 7,692 t/yr to 4,503 t/yr** and reduced emissions intensity from **1.55 to 0.91 kg CO<sub>2</sub>-e/kg HSCW**. (**41% reduction**).



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## Annual Greenhouse Gas Emissions Profile (calculated using PigGas)

Emissions	Emissions Baseline (kg CO <sub>2</sub> -e/yr)	Reduction Scenario (kg CO <sub>2</sub> -e/yr)
<b>Pre-farm</b>		
Grain	5,458,769	5,458,769
Milling & delivery	1,048,084	1,048,084
Pig freight	0	0
Straw & bedding	0	0
<b>Total Pre-farm</b>	<b>6,506,852</b>	<b>6,506,852</b>
<b>On-farm</b>		
<i>Fuels &amp; energy</i>		
Purchased electricity	723,410	0
Fuel - stationary	2,005,373	40,386
Fuel - transport	0	0
<i>Enteric CH<sub>4</sub></i>	779,284	779,284
<i>Manure management</i>		
MMS CH <sub>4</sub>	2,231,726	2,231,786
MMS – direct N <sub>2</sub> O	163,959	163,959
MMS – Atmos. deposition N <sub>2</sub> O	3,228	3,228
<i>Waste applied to soil</i>		
Soil – direct N <sub>2</sub> O	1,585,684	1,585,684
Soil – leaching & runoff N <sub>2</sub> O	199,202	199,202
<i>Offsets (Electricity to grid)</i>	0	-500,000
<b>Total On-farm</b>	<b>7,691,866</b>	<b>4,503,469</b>
<b>Post-farm</b>		
Pig freight	3,186	3,186
Meat processing	1,986,229	1,986,229
Exported manure	55,203	55,203
<b>Total Post-farm</b>	<b>2,044,618</b>	<b>2,044,618</b>
<b>Dressed weight sold - HSCW (kg/yr)</b>	<b>4,965,574</b>	<b>4,965,574</b>
<b>Carbon footprint</b>	<b>(kg CO<sub>2</sub>-e / kg HSCW)</b>	<b>(kg CO<sub>2</sub>-e / kg HSCW)</b>
Pre-farm	1.31	1.31
<b>On-farm</b>	<b>1.55</b>	<b>0.91</b>
Post-farm	0.41	0.41
<b>Total</b>	<b>3.27</b>	<b>2.63</b>



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Ian Kruger Consulting