

# PigGas Report 2 – 2,115 sow, farrow to finish, conventional piggery, NSW.

September 2013

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## Production details

This is a large family owned conventional piggery. Breeding and growing pigs are housed on one site. Pigs are sold at a range of weights for both domestic and export markets at an average of 110 kg live weight. A large on-site feed mill prepares feed for this piggery and a number of others as well.

## Feed consumption

Feed ingredients are purchased off-site and milled and mixed on-site. Total feed consumed is 7,259 t/yr.

## Sales/Transfers

46,918 pigs leave the piggery each year with a total dressed weight of 1,600 t/yr. This comprises 15,831 pigs sold at a range of domestic and export market weights, 30,270 weaners which are sent to two other piggeries for growing and finishing and 817 cull sows. Transfers to the piggery comprise 1,300 gilts for breeding and 3,342 weaners for growing.

## Waste management systems

Manure is flushed from each shed in underfloor drains to a newly commissioned 8.5 ML covered anaerobic pond. Methane from this pond is captured and combusted in two gensets to generate electricity.



Treated effluent and pond sludge is then pumped to three Sedimentation and Evaporation Ponds (SEPS) which are dried out and desludged annually. The overflow from the SEPS is pumped to holding ponds from where treated effluent is recycled for flushing and irrigated to paddocks.

## Manure reuse systems

Sludge from the SEPS is dried and solids are spread on crops and pastures. About 20% of dried sludge containing about 2% of total effluent nutrients is sold off-site each year.



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Effluent from the holding ponds is regularly irrigated to large areas of pastures for sheep and cattle grazing and to cropping areas. Total property area is 560 ha, most of which is used for irrigating effluent to grazed pastures and cropping.

## On-Farm Baseline Emissions

Original annual emissions prior to building the covered pond and electricity generation were **10,460 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **7.56 kg CO<sub>2</sub>-e/kg HSCW**.

Following installation of the covered pond and electricity generation, the baseline emissions for this piggery total **2,220 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **1.60 kg CO<sub>2</sub>-e/kg HSCW**, a 79% reduction.

This calculation includes the destruction of pond methane (7,219 t CO<sub>2</sub>-e/yr) and 60% replacement of electricity generated for the site. It is likely that following full functioning of the pond system in the next year, 100% of site electricity may be generated. It is also planned to recover heat from the engine for piped hot water heating of suckers and weaner pig accommodation on site.



## On-Farm Emissions Reduction Scenario

There are three options to reduce emissions. The first is to reduce feed wastage of the gilts, grower pigs and finisher pigs (15% to 10%) through better adjustment and management or replacement of feeders. The second is to account for generation of electricity to replace all electricity use on site. The third is to replace LPG energy used to heat suckers and weaner pigs by recovering waste heat from the genset engines. Engine coolant water will be collected in an insulated tank and reticulated to heat pads in sheds and pens to heat small pigs.

This scenario (see table below) reduced on-farm emissions **from 2,220 t/yr to 1,753 t/yr** and reduced kg CO<sub>2</sub>-e/kg HSCW **from 1.60 to 1.27 (21% reduction)**.

The piggery owners are currently investigating the process of becoming a Recognised Offset Entity with the Clean Energy Regulator to enable them to apply for a project under the CFI Methodology “Destruction of methane from manure in piggeries”.



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

Emissions	Current Emissions Baseline (kg CO <sub>2</sub> -e/yr)	Reduction Scenario (kg CO <sub>2</sub> -e/yr)
<b>Pre-farm</b>		
Grain	1,814,729	1,761,674
Milling & delivery	0	0
Pig freight	1,515	1,515
Straw & bedding		
<b>Total Pre-farm</b>	<b>1,816,244</b>	<b>1,763,189</b>
<b>On-farm</b>		
<i>Fuels &amp; energy</i>		
Purchased electricity	66,750	0
Fuel - stationary	251,019	0
Fuel - transport	13,491	13,491
<i>Enteric CH<sub>4</sub></i>	243,156	243,396
<i>Manure management</i>		
MMS CH <sub>4</sub>	902,291	785,867
MMS – direct N <sub>2</sub> O	61,796	59,104
MMS – Atmos. deposition N <sub>2</sub> O	0	0
<i>Waste applied to soil</i>		
Soil – direct N <sub>2</sub> O	604,996	578,641
Soil – leaching & runoff N <sub>2</sub> O	76,003	72,692
<b>Total On-farm</b>	<b>2,219,502</b>	<b>1,753,190</b>
<b>Post-farm</b>		
Pig freight	299,072	299,072
Meat processing	640,172	640,172
Exported manure	13,898	13,293
<b>Total Post-farm</b>	<b>953,142</b>	<b>952,536</b>
<b>Dressed weight sold - HSCW (kg/yr)</b>	<b>1,600,429</b>	<b>1,600,429</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	1.27
<b>On-farm</b>	<b>1.60</b>	<b>1.27</b>
Post-farm	0.69	0.69
<b>Total</b>	<b>3.61</b>	<b>3.23</b>



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