

# PigGas Report 45 – 1,840 sow, farrow to finish, conventional and deep litter piggery, SA.

December 2014



## Production details

This is a large family owned conventional and deep litter piggery. Five separate sites house pigs – a conventional breeding site, a deep litter weaner site and three conventional grower sites. Most of the sheds are naturally ventilated. Pigs are sold at three different live weights for different domestic markets. Porkers are sold at an average of 68 kg, super porkers at 82 kg and baconers at 102 kg live weight.



## Feed consumption

Normal cereal based feedstuffs are milled and mixed off-site and purchased as pelleted rations. Total feed consumed by all pigs is 9,243 t/yr.

## Sales/Tranfers

36,588 pigs/yr are sold with a total dressed weight of 2,854 t/yr.

## Waste management systems

Most of the conventional sheds have underfloor pit storage (pull plug system) with stored effluent released regularly from the sheds to a collection sump on each site. From the collection sump, effluent is pumped or drained to a primary anaerobic treatment pond on each site which is followed by a further 2 or 3 ponds which store and evaporate effluent. On the weaner site, deep litter sheds are filled to about 300 mm depth with cereal straw which absorbs manure.



The National PigGas Extension Project is funded by Ian Kruger Consulting, the Australian Government and Australian Pork Limited.

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## Manure reuse systems

On the conventional breeding and grower sites, all effluent from the anaerobic and subsequent holding ponds is evaporated. No effluent irrigation required. Sludge is excavated from these ponds annually, dried and sold off-site as fertiliser. On the weaner site, all spent litter solids is removed from the sheds after each batch of pigs and stockpiled on-site. All of the stockpiled spent litter is then sold to neighbouring farms as fertiliser for annual cereal cropping.



## On-Farm Baseline Emissions

The current baseline emissions for this piggery total **10,810 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **3.79 kg CO<sub>2</sub>-e/kg HSCW**.

## On-Farm Emissions Reduction Scenario

The reduction scenario modelled was to cover the primary anaerobic ponds on the breeding site and on one of the grower sites comprising approximately 40% of all growing pigs. These two sites are 1.2 km apart so it is possible to transfer biogas by pipeline from the grower site to the breeding site where a large quantity of energy is needed to heat piglets. Alternatively, effluent from the grower site could be pumped to a single covered anaerobic pond or digester at the breeding site. The scenario also modelled combusting biogas (methane) to generate electricity to replace all purchased electricity at both sites, and burning biogas directly in piglet gas heaters to replace all purchased LPG at the breeding site.

This scenario (see table below) reduced on-farm emissions **from 10,810 t/yr to 3,871 t/yr** and reduced kg CO<sub>2</sub>-e/kg HSCW **from 3.79 to 1.36 (64% reduction)**.

The feasibility of constructing either a covered pond system or an engineered digester system with electricity generation and direct burning of biogas for heating is currently being investigated by the piggery owners.



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

Emissions	Current Emissions Baseline	Reduction Scenario (kg CO <sub>2</sub> -e/yr)
<b>Pre-farm</b>		
Grain	2,310,830	2,310,830
Milling & delivery	443,679	443,679
Pig freight	2,229	2,229
Straw & bedding	8,000	8,000
<b>Total Pre-farm</b>	<b>2,764,738</b>	<b>2,764,738</b>
<b>On-farm</b>		
<i>Fuels &amp; energy</i>		
Purchased electricity	34,620	0
Fuel - stationary	2,464,695	89,434
Fuel - transport	0	0
<i>Enteric CH<sub>4</sub></i>	328,370	328,370
<i>Manure management</i>		
MMS CH <sub>4</sub>	7,327,912	2,808,453
MMS – direct N <sub>2</sub> O	241,566	241,566
MMS – Atmos. deposition N <sub>2</sub> O	199,858	68,515
<i>Waste applied to soil</i>		
Soil – direct N <sub>2</sub> O	184,706	289,780
Soil – leaching & runoff N <sub>2</sub> O	28,745	45,097
<i>Offsets</i>	0	0
<b>Total On-farm</b>	<b>10,810,471</b>	<b>3,871,215</b>
<b>Post-farm</b>		
Pig freight	38,629	38,629
Meat processing	1,154,263	1,154,263
Exported manure	115,536	145,893
<b>Total Post-farm</b>	<b>1,308,428</b>	<b>1,338,785</b>
<b>Dressed weight sold - HSCW (kg/yr)</b>	<b>2,854,352</b>	<b>2,854,352</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	0.97	0.97
<b>On-farm</b>	<b>3.79</b>	<b>1.36</b>
Post-farm	0.46	0.47
<b>Total</b>	<b>5.21</b>	<b>2.79</b>



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