

PigGas Report 1 – 850 sow, farrow to finish, conventional piggery, NSW.

September 2013



Production details

This is a medium sized family owned conventional piggery. All pigs except the weaners are housed in five naturally ventilated drained sheds. The weaner pigs are grown in nine straw-based deep litter sheds. Finisher pigs are sold for the domestic market at 100kg live weight.

Feed consumption

All feed used in the piggery is purchased off-site and milled and mixed on-site. Total feed consumed is 4,526 t/yr.

Sales/Tranfers

17,160 pigs/yr are sold with a total dressed weight of 1,349 t/yr.

Waste management systems



Manure is collected in underfloor drains in the conventional sheds and is flushed daily using manually operated flush tanks at the end of each shed. Effluent flows to two primary anaerobic settling ponds. These long narrow ponds are desludged annually with an excavator. Effluent then flows to a secondary facultative pond followed by a tertiary storage pond from which effluent is recycled to flush the sheds. Overflow effluent from the pond treatment system is then evaporated in a shallow evaporation basin. No effluent is irrigated on the piggery.

The weaner sheds use rice straw as the deep litter. The spent litter is cleaned out after each batch of weaners by front-end loader and stockpiled for later spreading or sale.



Manure reuse systems

All treated effluent is evaporated. Since there are no emissions factors for effluent evaporation in the National Greenhouse Gas Accounts, this was modelled as effluent land applied.

Approximately 15% of dried pond sludge volume is sold off-site which comprises about 2% of



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the total quantity of pond effluent nutrients. Also, approximately 15% of spent ecoshed litter volume is currently sold off-site which comprises about 15% of total quantity spent litter nutrients removed from the sheds.

Total property area is 280 hectares which comprises 120 hectares of sheep, goat and cattle grazing plus about 160 hectares of cereal cropping.

On-Farm Baseline Emissions

The current baseline emissions for this piggery total **5,193 tonnes CO₂-e/yr** with an emissions intensity of **3.85 kg CO₂-e/kg HSCW**.

On-Farm Emissions Reduction Scenario

A combination of two reduction scenarios was considered.

The first reduction scenario modelled was to export (sell) 100% of the primary pond sludge solids which comprises about 13% of total pond nutrients each year and to export 100% of the weaner ecoshed spent litter solids which comprises 100% of total spent litter nutrients removed from the sheds.

The second reduction scenario modelled was to cover the two primary settling ponds and capture and flare biogas (methane). The aim is to generate Australian Carbon Credit Units under the Carbon Farming Initiative Methodology “Destruction of methane from manure in piggeries”.

This scenario (see table below) reduced on-farm emissions **from 5,193 t/yr to 1,532 t/yr** and reduced kg CO₂-e/kg HSCW **from 3.85 to 1.14 (70% reduction)**.

The piggery owners are currently pursuing off-site sales of all primary pond sludge and ecoshed spent litter solids.

In addition, the owners have already sought engineering advice on costs and feasibility of pond covering and generation of electricity from biogas, but the costs were too high and payback period too long for their piggery. Another major concern was the complexity of on-going operation and maintenance.

The owners are currently contemplating whether or not to proceed with covering and flaring methane only. They are looking at the feasibility of floating pond covers which can be removed to enable annual excavation of pond sludge. They are also uncertain about the feasibility of the project given the current uncertainty surrounding future value of Australian Carbon Credit Units.



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Annual Greenhouse Gas Emissions Profile (calculated using PigGas)

Emissions	Current Emissions Baseline (kg CO ₂ -e/yr)	Reduction Scenario (kg CO ₂ -e/yr)
Pre-farm		
Grain	1,131,609	1,131,609
Milling & delivery	0	0
Pig freight	0	0
Straw & bedding	26,024	26,024
Total Pre-farm	1,157,633	1,157,633
On-farm		
<i>Fuels & energy</i>		
Purchased electricity	376,379	376,379
Fuel - stationary	0	0
Fuel - transport	2,698	2,698
<i>Enteric CH₄</i>	154,841	154,841
<i>Manure management</i>		
MMS CH ₄	4,056,022	463,256
MMS – direct N ₂ O	202,574	202,574
MMS – Atmos. deposition N ₂ O	158,823	38,829
<i>Waste applied to soil</i>		
Soil – direct N ₂ O	214,969	260,725
Soil – leaching & runoff N ₂ O	27,005	32,754
Total On-farm	5,193,312	1,532,056
Post-farm		
Pig freight	81,440	81,440
Meat processing	539,686	539,686
Exported manure	11,767	95,331
Total Post-farm	632,893	716,457
Dressed weight sold - HSCW (kg/yr)	1,349,215	1,349,215
Carbon footprint	(kg CO₂-e / kg HSCW)	(kg CO₂-e / kg HSCW)
Pre-farm	0.86	0.86
On-farm	3.85	1.14
Post-farm	0.47	0.53
Total	5.18	2.52



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