

PigGas Report 17 – 480 sow, farrow to finish, conventional and deep litter piggery, Vic.

December 2013



Production details

This is a family owned 480 sow farrow to finish piggery. Pigs are housed in 6 conventional naturally ventilated sheds and 12 straw-based deep litter sheds. Pigs are sold at 23 weeks old with an average live weight of 104 kg for the fresh pork market.

Feed consumption

All feedstuffs are purchased off-site and are stored, milled and mixed on-site. Total feed consumed is 3,004 t/yr.



Sales/Tranfers

An average of 25 gilts and 10 boars are purchased and transferred onto the site each year using external transport contractors. A total of 11,001 pigs/yr are sold with a total dressed weight of 877 t/yr. External contractors transport the pigs from the site to the abattoir.

Waste management systems

Effluent is removed from the conventional sheds using a number of methods. The farrowing shed is hosed. Dry sow and presale sheds have pull plug storage pits which are released regularly. The grower and finisher sheds are flushed with tipping buckets using fresh water. Effluent from the conventional sheds drains to a shallow primary anaerobic pond followed by a secondary treatment pond and a third storage pond. Some sludge from the primary pond is excavated at irregular intervals and dried and stockpiled with spent litter.



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Spent litter from the deep litter sheds is removed with a front-end loader and stockpiled on site.



Manure reuse systems

All stockpiled deep litter and excavated pond sludge are sold off-site to neighbouring farms as fertiliser. Effluent from the storage pond is combined with fresh water and flood irrigated to pastures comprising lucerne, clovers and rye grass. Cattle graze the irrigated pastures. Total pasture area available for reuse is 28 ha.

On-Farm Baseline Emissions

The current baseline emissions for this piggery total **2,457 tonnes CO₂-e/yr** with an emissions intensity of only **2.80 kg CO₂-e/kg HSCW**. This figure is relatively low because: (a) deep litter sheds produce substantially lower overall emissions than flushed sheds with treatment ponds; and (b) spent litter solids are exported rather than land applied on-site.



On-Farm Emissions Reduction Scenario

The owners of this piggery are planning the construction of an engineered biodigester. All the piggery wastes i.e. effluent flushed from the conventional sheds and spent litter from the deep litter sheds will be fed directly into the digester together with other major waste streams from the surrounding district including dairy and municipal wastes. All effluent and solids from the digester will be exported as sales so there will be no future land application on the piggery property. The combusted biogas energy and the fertilisers recovered from the digester will comprise another enterprise apart from the piggery enterprise. Therefore, no piggery on-farm energy offsets were modelled.

This scenario (see table below) reduced on-farm emissions **from 2,457 t/yr to 735 t/yr** and reduced kg CO₂-e/kg HSCW **from 2.80 to 0.84 (70% reduction)**.

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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	751,054	751,054
Milling & delivery		
Pig freight	162	162
Straw & bedding	12,765	12,765
Total Pre-farm	763981	763981
On-farm		
<i>Fuels & energy</i>		
Purchased electricity	266,200	266,200
Fuel - stationary	49,436	49,436
Fuel - transport		
<i>Enteric CH₄</i>	113,105	113,105
<i>Manure management</i>		
MMS CH ₄	1,577,337	280,833
MMS – direct N ₂ O	231,799	25,407
MMS – Atmos. deposition N ₂ O	107,061	
<i>Waste applied to soil</i>		
Soil – direct N ₂ O	87,123	
Soil – leaching & runoff N ₂ O	25,091	
<i>Offsets</i>		
Total On-farm	2,457,153	734,982
Post-farm		
Pig freight	23,746	23,746
Meat processing	352,370	352,370
Exported manure	74,153	326,921
Total Post-farm	450,269	703,037
Dressed weight sold - HSCW (kg/yr)	876,623	876,623
Carbon footprint	(kg CO₂-e / kg HSCW)	(kg CO₂-e / kg HSCW)
Pre-farm	0.87	0.87
On-farm	2.80	0.84
Post-farm	0.51	0.80
Total	4.19	2.51



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