

# PigGas Report 16 – 1950 sow, farrow to finish, conventional piggery, Vic.

December 2013

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## Production details

This is a family owned conventional piggery. The stock are separated for biosecurity purposes into four sites – a breeder unit (shown above), a weaner unit and two grower units.

## Feed consumption

All cereals used in pig diets, mainly barley and wheat, are purchased off-site and milled on-site. By-products including whey, whole milk and malt combings are formulated with the milled cereals and other minor ingredients into feedstuffs for all classes of pigs. Most of the pigs are fed with a computerised liquid feeding system. Total feed consumed is 12,440 t/yr.



## Sales/Tranfers

Being a closed herd, no pigs, external to the herd, are brought into any of the piggery sites. The owners move the pigs between units with their own transport. Pigs are sold for the fresh pork market at an average of 95 kg live weight. In addition, some gilts and boars are sold as breeding stock. In total, 42,437 pigs/yr are sold with a total dressed weight of 3,363 t/yr. External contractors transport the pigs from the piggery sites to the abattoir.

## Waste management systems

On each site, manure is flushed from the sheds with treated and recycled effluent to a treatment pond system comprising an anaerobic pond, secondary treatment pond and a tertiary storage pond. Stored effluent is recycled for shed flushing, irrigated to land or evaporated.



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### Manure reuse systems

Effluent from the holding ponds is combined with flood irrigation water to irrigate wheat, barley and canola (windrows shown below). Approximately



1,400 hectares are available for cereal cropping and grazing sheep.

### On-Farm Baseline Emissions

The current baseline emissions for this piggery total **16,598 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **4.93 kg CO<sub>2</sub>-e/kg HSCW**.

### On-Farm Emissions Reduction Scenario

The majority of emissions on this piggery (12,718 t CO<sub>2</sub>-e/y or 77%) come from pond methane. The owners have recently constructed three new covered anaerobic ponds which collect and treat effluent from all four piggery sites. This was done for two main reasons: (1) to fulfil environmental requirements to reduce site odour; and (2) to replace high energy usage on-site associated with pig heating, feed milling and by-product re-use.



A flare was recently installed on one covered pond to flare the biogas. The owners are currently communicating with the Clean Energy Regulator to register this project under the Carbon Farming Initiative. Flares have not yet been installed on two of the ponds.

The owners are planning to install gas engines fitted with DC generators and inverters at all three covered ponds. These will generate electricity and heat replacing all site electricity and LPG use. They estimate a generation capacity of 15% above sites' electricity needs. This excess power will be fed back into grid as a greenhouse gas 'offset' for the piggery. Total annual use of electricity on site is currently 633,366 kWh/y and LPG use is 44,744 L/y .



A greenhouse gas reduction scenario was modelled to incorporate all of the above proposed changes (see table below). It reduced on-farm emissions **from 16,598 t/yr to 3,121 t/yr** and reduced kg CO<sub>2</sub>-e/kg HSCW **from 4.93 to 0.93 (81% reduction)**.

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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	3,109,942	3,109,942
Milling & delivery		
Pig freight		
Straw & bedding		
<b>Total Pre-farm</b>	<b>3,109,942</b>	<b>3,109,942</b>
<b>On-farm</b>		
<i>Fuels &amp; energy</i>		
Purchased electricity	1,927,382	
Fuel - stationary	131,769	62,888
Fuel - transport		
<i>Enteric CH<sub>4</sub></i>	452,106	452,106
<i>Manure management</i>		
MMS CH <sub>4</sub>	12,717,643	1,413,071
MMS – direct N <sub>2</sub> O	107,654	107,654
MMS – Atmos. deposition N <sub>2</sub> O	430,616	
<i>Waste applied to soil</i>		
Soil – direct N <sub>2</sub> O	644,847	1,075,463
Soil – leaching & runoff N <sub>2</sub> O	185,716	309,733
<i>Offsets</i>		-300,000
<b>Total On-farm</b>	<b>16,597,732</b>	<b>3,120,916</b>
<b>Post-farm</b>		
Pig freight	86,743	86,743
Meat processing	1,345,374	1,345,374
Exported manure		
<b>Total Post-farm</b>	<b>1,432,117</b>	<b>1,432,117</b>
<b>Dressed weight sold - HSCW (kg/yr)</b>	<b>3,363,435</b>	<b>3,363,435</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	0.92	0.92
<b>On-farm</b>	<b>4.93</b>	<b>0.93</b>
Post-farm	0.43	0.43
<b>Total</b>	<b>6.29</b>	<b>2.28</b>



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