PigGas Report 49 – 525 sow, farrow to finish, conventional piggery, Vic.
December 2014

Production details

This is a medium sized family owned conventional piggery. Most of the pigs are housed in conventional naturally ventilated sheds. Weaner pigs and lactating sows are housed in mechanically ventilated sheds. Finisher pigs are sold into domestic markets at an average of 97 kg live weight.

Feed consumption

Complete feed rations for each class of pig are purchased off-site and delivered to the piggery. Dairy factory by-products are mixed on-site with dry feed rations and liquid fed to all grower and finisher pigs. Also, dry sow rations are mixed with water on-site and liquid fed. All other rations are dry fed to boars, gilts, lactating sows and weaner pigs. Total feed consumed by all pigs is 2,894 t/yr.

Sales/Tranfers

11,644 pigs/yr are sold with a net dressed weight of 922 t/yr.

Waste management systems

The conventional sheds have either drains that are flushed with fresh water or underfloor pit storage drains. Effluent is regularly drained from the sheds to a 90,000 litre collection sump. From the sump, effluent is then pumped 700 metres to a run-down screen which removes course solids. Effluent then flows to a primary anaerobic pond followed by a secondary treatment/storage pond.

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Manure reuse systems

Effluent from the storage pond is irrigated to approximately 160 hectares of pastures used for grazing cattle. Screened solids are composted and spread on-site to grazed pastures. The total farm area is approximately 400 hectares.

On-Farm Baseline Emissions

The current baseline emissions for this piggery total **2,486 tonnes CO_2-e/yr** with an emissions intensity of **2.70 kg CO_2-e/kg HSCW**.

On-Farm Emissions Reduction Scenario

The owners are considering doubling the capacity of the piggery from 525 sows to 1,050 sows farrow to finish on this site. Without any change to the current production or waste management systems, the on-farm emissions would then double to **4,972 tonnes CO_2-e/yr** with the same emissions intensity of **2.70 kg CO_2-e/kg HSCW**.

To reduce emissions, the scenario modelled was to:
(a) double the pig numbers on site;
(b) cover the primary anaerobic pond and capture biogas (methane);
(c) combust biogas in a gas engine driven genset to generate and replace all site electricity, and;
(d) capture waste heat from the genset engine to replace LPG used to heat suckers and weaners.

This scenario (see table below) will reduce on-farm emissions **from the current 2,486 t/yr to 1,317 t/yr** (47%) and reduce emissions intensity from **2.70 to 0.71 kg CO_2-e/kg HSCW (74%)**.

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Annual Greenhouse Gas Emissions Profile (calculated using PigGas)

Emissions	Current Emissions Baseline	Reduction Scenario (kg CO$_2$-e/yr)
Pre-farm		
Grain	723,481	1,446,962
Milling & delivery	138,908	277,817
Pig freight	1,549	3,099
Straw & bedding	0	0
Total Pre-farm	*863,938*	*1,727,877*
On-farm		
Fuels & energy		
Purchased electricity	184,223	0
Fuel - stationary	80,353	35,412
Fuel - transport	0	0
Enteric CH$_4$	105,666	211,333
Manure management		
MMS CH$_4$	1,823,291	475,280
MMS – direct N$_2$O	41,808	42,880
MMS – Atmos. deposition N$_2$O	86,296	0
Waste applied to soil		
Soil – direct N$_2$O	127,686	428,371
Soil – leaching & runoff N$_2$O	36,774	123,371
Offsets	0	0
Total On-farm	*2,486,097*	*1,316,647*
Post-farm		
Pig freight	17,722	35,444
Meat processing	369,599	739,198
Exported manure	0	0
Total Post-farm	*387,321*	*774,642*
Dressed weight sold - HSCW (kg/yr)	**921,541**	**1,843,082**
Carbon footprint	**(kg CO$_2$-e / kg HSCW)**	**(kg CO$_2$-e / kg HSCW)**
Pre-farm	0.94	0.94
On-farm	**2.70**	**0.71**
Post-farm	0.42	0.42
Total	**4.06**	**2.07**

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