

# PigGas Report 32 – 576 sow, farrow to finish, conventional and deep litter piggery, SA.

May 2014



## Production details

This is a medium sized family owned conventional and deep litter piggery operating on two separate sites. The breeder site houses pigs in 7 sheds, comprising 6 naturally ventilated sheds for gilts, boars and dry sows and 1 climate controlled shed for lactating sows. On the grower site pigs are housed from weaning to finishing in 24 naturally ventilated straw-based deep litter shelters and 2 conventional sheds with effluent storage drains.

## Feed consumption

All feed ingredients are purchased off-site and the majority is milled and mixed into pelleted rations for the grower site. Rations for the gilts, boars, dry sows and lactating sows are milled and mixed at the breeder site. Total feed consumed is 3,358 t/yr.

## Sales/Tranfers

13,260 weaned piglets are transferred each year from the breeder site to the grower site for growing and finishing. The finisher pigs are sold at an average of 93 kg live weight for the domestic market. 12,855 pigs/yr are sold with a total dressed weight of 913 t/yr.

## Waste management systems

At the breeder site, effluent is regularly flushed from 4 sheds with underfloor drains. The remaining 3 sheds have underfloor storage drains which are released when full. All shed effluent drains to two large concrete sumps and is cycled through a screw press separator to remove course solids.



At the grower site, straw bedding and manure accumulate in each deep litter shed during each batch of growing pigs and spent litter is removed from shelters with a front-end loader at the end of each batch. Effluent from the two conventional sheds is released to one of two anaerobic pond/evaporation ponds which are used alternately.



## Manure reuse systems

At the breeder site, all effluent from the sumps is exported off-site by pumping 4.5 km to a neighbouring property. The



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separated solids from the screw press are spread on-site on cereal cropping land.



At the grower site, 85% of the stockpiled spent litter is spread annually on-site on cereal cropping land as fertiliser and 15% of spent litter is exported off-site. Effluent from each anaerobic/evaporation pond is evaporated alternately, the sludge dried, excavated and spread on-site on cereal cropping land.

## On-Farm Baseline Emissions

The current baseline emissions for this piggery total **1,058 tonnes CO<sub>2</sub>-e/yr**, comprising 409 t CO<sub>2</sub>-e/yr on the breeder site and 649 t CO<sub>2</sub>-e/yr on the grower site, with an emissions intensity of **1.16 kg CO<sub>2</sub>-e/kg HSCW**, comprising 4.79 kg CO<sub>2</sub>-e/kg HSCW on the breeder site and 0.78 kg CO<sub>2</sub>-e/kg HSCW on the grower site.

## On-Farm Emissions Reduction Scenario

After discussion with the piggery owners, no reduction scenarios were identified for this piggery which could be applied immediately. Feed wastage is low. Emissions in general are quite low due to the large proportion of deep litter housing and significant quantities of exported effluent and solids. Covering anaerobic lagoons and flaring biogas was not seen as a viable option by the owners as the manure systems currently used and the low effluent quantities available on both sites preclude this. Solar energy offsets were previously investigated by the owners and discounted as an economic option to replace breeder site purchased electricity.

As a case study only, the reduction scenario modelled is the export off-site of all deep litter solids and dried pond solids from the grower site and all separated solids from the breeder site. This may become an option in the future if manure solids are sold or exchanged for neighbours straw supply to the piggery.

This scenario (see table below) reduced on-farm emissions **from 1,058 t/yr to 757t/yr**, comprising 390 t CO<sub>2</sub>-e/yr on the breeder site and 367 t CO<sub>2</sub>-e/yr, and reduced kg CO<sub>2</sub>-e/kg HSCW **from 1.16 to 0.83 (28% reduction)**, comprising 4.57 kg CO<sub>2</sub>-e/kg HSCW on breeder site and 0.44 kg CO<sub>2</sub>-e/kg HSCW on grower site).



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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	839,595	839,595
Milling & delivery	161,202	161,202
Pig freight	1,943	1,943
Straw & bedding	15,341	15,341
<b>Total Pre-farm</b>	<b>1,018,080</b>	<b>1,018,080</b>
<b>On-farm</b>		
<i>Fuels &amp; energy</i>		
Purchased electricity	46,341	46,341
Fuel - stationary	72,574	72,574
Fuel - transport	0	0
<i>Enteric CH<sub>4</sub></i>	108,844	108,844
<i>Manure management</i>		
MMS CH <sub>4</sub>	496,536	265,133
MMS – direct N <sub>2</sub> O	192,992	180,543
MMS – Atmos. deposition N <sub>2</sub> O	82,319	77,365
<i>Waste applied to soil</i>		
Soil – direct N <sub>2</sub> O	50,510	5,122
Soil – leaching & runoff N <sub>2</sub> O	7,861	797
<i>Offsets</i>	0	0
<b>Total On-farm</b>	<b>1,057,976</b>	<b>756,720</b>
<b>Post-farm</b>		
Pig freight	6,210	6,210
Meat processing	374,159	374,159
Exported manure	51,855	138,739
<b>Total Post-farm</b>	<b>432,224</b>	<b>519,108</b>
<b>Dressed weight sold - HSCW (kg/yr)</b>	<b>912,656</b>	<b>912,656</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	1.12	1.12
<b>On-farm</b>	<b>1.16</b>	<b>0.83</b>
Post-farm	0.47	0.57
<b>Total</b>	<b>2.75</b>	<b>2.51</b>



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