

# PigGas Report 29 – 740 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. Pigs are housed on one site in 12 conventional sheds with various natural and mechanical ventilation systems and in 19 naturally ventilated deep litter sheds. It is a closed herd using artificial insemination.



## Feed consumption

All pig feeds are purchased off-site in pelleted form. Total feed consumed is 3,772 t/yr.

## Sales/Tranfers

Finisher pigs are sold at an average of 99 kg live weight for the domestic market. 14,600 pigs/yr are sold with a total dressed weight of 1,117 t/yr.

## Waste management systems

Effluent is collected in the conventional sheds mainly in underfloor pull-plug or storage drains with a few sheds either flushed or hosed. Shed effluent flows to a primary anaerobic treatment pond and then to an evaporation pond. Spent litter manure is removed from the deep litter sheds at the end of each batch of pigs by a front-end loader.



## Manure reuse systems

Most of the treated effluent is evaporated. Spent litter from the deep litter sheds is windrowed and



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composted. Approximately 10% of the anaerobic pond slurry is removed each year with a vacuum tanker and added into the spent litter compost to provide moisture and additional nutrients. A small proportion of this slurry is spread on-site onto citrus and olive tree crops. One quarter of the prepared compost is spread each year on-site onto the citrus and olive trees with three quarters of the compost sold off-site. Total property area is 120 hectares which includes 30 hectares of irrigated citrus trees and 20 hectares of irrigated olive trees.

## On-Farm Baseline Emissions

The current baseline emissions for this piggery total **2,133 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **1.91 kg CO<sub>2</sub>-e/kg HSCW**. This is less than half the emissions of a conventional piggery because more than 60% of the total pig manure is contained in deep litter shelters rather than generating pond methane and 75% of composted manure solids are subsequently exported off-site rather than being land applied on-site. In addition, a 5 kW solar panel array is installed on one of the pig sheds to offset some of the site electricity costs.



## On-Farm Emissions Reduction Scenario

The owners have planned a production increase from 740 sows to 950 sows farrow to finish and have commenced construction of 7 new deep litter sheds to house dry sows and grower pigs.

To fully offset future electricity use on-site, solar power



generation is planned to increase from 5 kW to 50 kW.

To reduce site odour to neighbours, approval has been obtained to construct a new covered anaerobic pond with flaring of biogas.

This scenario (see table below) reduced on-farm emissions **from 2,133 t/yr to 1,302 t/yr** and reduced kg CO<sub>2</sub>-e/kg HSCW **from 1.91 to 0.78 (59% reduction)**. If no emission reduction strategies were applied, the proposed piggery expansion would increase emissions by about 28%.

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## Annual Greenhouse Gas Emissions Profile (calculated using PigGas)

| Emissions                                 | Current Emissions<br>Baseline          | Reduction Scenario<br>(kg CO <sub>2</sub> -e/yr) |
|---|--|--|
| <b>Pre-farm</b>                           |  |  |
| Grain                                     | 943,004                                | 1,248,348  |
| Milling & delivery                        | 181,057                                | 239,683  |
| Pig freight                               | 0                                      | 0  |
| Straw & bedding                           | 13,794                                 | 14,495   |
| <b>Total Pre-farm</b>                     | <b>1,137,855</b>                       | <b>1,502,526</b>                                 |
| <b>On-farm</b>                            |  |  |
| <i>Fuels &amp; energy</i>                 |  |  |
| Purchased electricity                     | 72,594                                 | 78,880   |
| Fuel - stationary                         | 27,955                                 | 32,548   |
| Fuel - transport                          | 0                                      | 0  |
| <i>Enteric CH<sub>4</sub></i>             | 139,291                                | 184,530  |
| <i>Manure management</i>                  |  |  |
| MMS CH <sub>4</sub>                       | 1,281,769                              | 185,668  |
| MMS – direct N <sub>2</sub> O             | 379,213                                | 583,211  |
| MMS – Atmos. deposition N <sub>2</sub> O  | 132,774                                | 128,339  |
| <i>Waste applied to soil</i>              |  |  |
| Soil – direct N <sub>2</sub> O            | 92,055                                 | 153,029  |
| Soil – leaching & runoff N <sub>2</sub> O | 14,326                                 | 23,815   |
| <i>Offsets</i>                            | -6,800                                 | -68,000  |
| <b>Total On-farm</b>                      | <b>2,133,176</b>                       | <b>1,302,019</b>                                 |
| <b>Post-farm</b>                          |  |  |
| Pig freight                               | 42,974                                 | 63,166   |
| Meat processing                           | 446,797                                | 670,600  |
| Exported manure                           | 92,912                                 | 145,805  |
| <b>Total Post-farm</b>                    | <b>582,683</b>                         | <b>879,571</b>                                   |
| <b>Dressed weight sold - HSCW (kg/yr)</b> | <b>1,116,993</b>                       | <b>1,676,500</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                                  | 1.02                                   | 0.90   |
| <b>On-farm</b>                            | <b>1.91</b>                            | <b>0.78</b>                                      |
| Post-farm                                 | 0.52                                   | 0.52   |
| <b>Total</b>                              | <b>3.45</b>                            | <b>2.20</b>                                      |



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