

# PigGas Report 42 – 2,160 pig wean to finish, conventional and deep litter grow-out piggery, Qld

## September 2014



### Production details

This is a corporately owned, conventional and deep litter grow-out piggery. Weaned piglets are purchased at 21 days of age, averaging 6 kg live weight and transported to the piggery. Weaner pigs (first growth stage) are housed in one climate controlled conventional shed with underfloor effluent storage pits which are emptied regularly. The porkers (second growth stage) are housed in two deep litter sheds (sawdust plus cereal straw litter) and one conventional, naturally ventilated, flushed shed. The finishers (third growth stage) are housed in three conventional, naturally ventilated, flushed sheds. Finishers are sold off-site into domestic retail markets at an average of 101.5 kg live weight.



### Feed consumption

All feed supplied to the piggery is purchased off-site as milled and mixed rations from a commercial feed company. The total feed consumed is 1,308 t/yr.



### Sales/Tranfers

Approximately 5,552 weaned piglets/yr are purchased from a remote breeder piggery each year and brought onto the piggery. Approximately, 5,330 finisher pigs/yr are sold with a total net dressed weight of 386 t/yr.

### Waste management systems

Manure is flushed from all conventional sheds in underfloor drains to a single anaerobic treatment pond.

Spent deep litter solids are removed from the two porker sheds at the end of each batch of growing pigs at approximately 8 week intervals.



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### Manure reuse systems

Treated effluent from the single anaerobic pond is recycled for shed flushing. Excess pond effluent is regularly irrigated onto pasture used for cattle grazing. Spent litter solids are stockpiled on-site and regularly spread onto pastures used for cattle grazing.



### On-Farm Baseline Emissions

The current baseline emissions for this piggery total **1,273 tonnes CO<sub>2</sub>-e/yr** with an emissions intensity of **3.30 kg CO<sub>2</sub>-e/kg HSCW**.

### On-Farm Emissions Reduction Scenario

In consultation with piggery management, three greenhouse gas reduction scenarios were considered possible for this site.

The first scenario is to reduce feed wastage from 10% to 5% for all pigs on-site.

The second scenario is to sell (export) 80% of the spent deep litter solids to neighbouring farms to replace their conventional fertilisers.

The third scenario is to install a covered anaerobic pond, capture biogas (methane) and combust it in a gas engine/electricity generator/waste heat recovery system. It is anticipated this will replace all site electricity and heating LPG used on-site.



All three reduction scenarios were modelled together (see table below). This reduced on-farm emissions **from 1,273 t/yr to 253 t/yr** and reduced emissions intensity **from 3.30 to 0.66 kg CO<sub>2</sub>-e/kg HSCW (80% reduction)**.

The piggery owners intend to proceed with scenarios 1 and 2, and for scenario 3, they will obtain specialist assessment of the technical and financial feasibility of the biogas electricity generation and heat recovery option.



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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                                     | 327,081                                | 310,645  |
| Milling & delivery                        | 62,800                                 | 59,644   |
| Pig freight                               | 0                                      | 0  |
| Straw & bedding                           | 2,300                                  | 2,300  |
| <b>Total Pre-farm</b>                     | <b>392,181</b>                         | <b>372,589</b>                                   |
| <b>On-farm</b>                            |  |  |
| <i>Fuels &amp; energy</i>                 |  |  |
| Purchased electricity                     | 36,608                                 | 0  |
| Fuel - stationary                         | 805                                    | 805  |
| Fuel - transport                          | 0                                      | 0  |
| <i>Enteric CH<sub>4</sub></i>             | 40,476                                 | 40,578   |
| <i>Manure management</i>                  |  |  |
| MMS CH <sub>4</sub>                       | 1,056,241                              | 89,038   |
| MMS – direct N <sub>2</sub> O             | 35,911                                 | 32,670   |
| MMS – Atmos. deposition N <sub>2</sub> O  | 40,891                                 | 5,551  |
| <i>Waste applied to soil</i>              |  |  |
| Soil – direct N <sub>2</sub> O            | 59,277                                 | 81,227   |
| Soil – leaching & runoff N <sub>2</sub> O | 2,378                                  | 3,259  |
| <i>Offsets</i>                            | 0                                      | 0  |
| <b>Total On-farm</b>                      | <b>1,272,588</b>                       | <b>253,128</b>                                   |
| <b>Post-farm</b>                          |  |  |
| Pig freight                               | 3,506                                  | 3,506  |
| Meat processing                           | 164,536                                | 164,536  |
| Exported manure                           | 0                                      | 5,440  |
| <b>Total Post-farm</b>                    | <b>168,042</b>                         | <b>173,482</b>                                   |
| <b>Dressed weight sold - HSCW (kg/yr)</b> | <b>386,089</b>                         | <b>386,089</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                                   | 0.97   |
| <b>On-farm</b>                            | <b>3.30</b>                            | <b>0.66</b>                                      |
| Post-farm                                 | 0.44                                   | 0.45   |
| <b>Total</b>                              | <b>4.75</b>                            | <b>2.07</b>                                      |



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