

## 4C-102: *Piggery Biogas Capture and Energy Generation Feasibility Study*

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### Background

The Pork CRC is currently involved in research that will develop commercially viable effluent management systems for pig production that significantly reduce the net carbon footprint of piggeries. In particular, the research program will establish pork production systems that are carbon neutral through novel research such as the development of anaerobic digestion techniques. The research program will transform the Australian pig industry by specifically addressing critical environmental and economic issues that confront its sustainability and by investigating the most effective method(s) of reusing biogas to minimise the piggery's reliance on electricity from the grid and/or imported fuels such as diesel and liquefied petroleum gas (LPG).

### Methodology

The project was divided into a staged process for each of the five piggeries investigated, which provided the operators with advice on: initial investigations regarding layout of the system; the most appropriate anaerobic digestion technology; biogas use and conditioning; digestate management; and financial modelling of the most appropriate biogas use options.

The methodology is described as follows:

- Site visit and data collection.
- Modelling - Technical feasibility modelling of expected biogas production and potential energy production and financial modelling of the most appropriate biogas uses. Investigations into maximising co-benefits of the system.
- Reports and presentation.

### Key Findings/Conclusions

- The findings from this research indicate that there is potential of capturing and utilizing biogas to minimize piggeries' reliance on electricity from the grid and/or imported fuels such as diesel and liquefied petroleum gas (LPG).
- The five case studies have all been shown to be economically feasible with each piggery having short payback periods between 1.8 and 7.2 years and delivering a substantial positive return on investment over a 10-year project life. At present, there are also biogas capture and utilisation systems currently been successfully undertaken by other producers across Australia.
- The research indicates that biogas capture and utilisation technology can be successfully adopted at piggeries. However, all piggeries are different and care should be taken when interpreting these results. Each piggery would require an individual cost benefit and feasibility analysis before any biogas utilisation system was installed due to the variety of factors that affect both the practical and economic feasibility of such a system. These factors include but are not limited to piggery size and energy demand and cost. There may however be other drivers for piggeries to capture and destroy biogas, such as for odour reduction.

### Potential Users of Information

The main users of this information are anticipated to be:

- The pork industry.
- Researchers in the pork industry. Researchers may use the data and results here to guide future research.
- Pig farmers, who can use this research to aid in the uptake of biogas capture and utilisation technology.
- The general public.

At the discretion of the pork CRC, this information may be valuable for members of the general public who are concerned about the environmental impacts of pork.