

# VIABILITY OF SELLING EXCESS BIOGAS FOR PROFIT

## CLARIFYING BIOMETHANE AND SMALL SCALE BIOGAS OPTIONS FOR AUSTRALIAN PIGGERIES

Recently, APL finished a hypothetical case study (based on a real, large piggery in NSW) to explore the viability of selling biogas to third party upgraders.

AUSTRALIAN  
**Pork**

### What is it

Biogas is a renewable source of energy that can be produced from organic matter. In our industry, this is mainly piggery effluent. Biogas can be used to generate electricity, or power other farm equipment, but it can also be upgraded into higher quality biomethane.

### How it works

When carbon dioxide (CO<sup>2</sup>) is removed from biogas during a process called 'upgrading' it results in:

- Biomethane (a gas that resembles commercial natural gas)
- Bio-CO<sup>2</sup> (by-product)

### Benefits

Biogas can be sold for \$0.16 per Nm<sup>3</sup>. Biomethane (as a natural gas) is worth approximately \$12.65.GJ<sup>-1</sup> and can be used to power facilities like feedmills. In its liquefied form, biomethane can be used as a vehicle fuel, though there is currently not high demand for this. Bio-CO<sup>2</sup> can be used by processors and is worth approximately \$620.tonne<sup>-1</sup>).

### Scenario assumptions

Scenario assumptions:

#### Biogas:

- Is available at an excess of 250+ Nm<sup>3</sup>.h<sup>-1</sup> at least during the operational day.

#### Biomethane:

- After upgrading, the biomethane produced meets the necessary specifications for quality and safety.
- That there is an existing market for natural gas and CO<sup>2</sup> in the vicinity.

### FOR THE PIGGERY:

**Capital Cost:** \$2.35M installation of a covered pond and piping of biogas to secondary site  
**Estimate Simple Payback:** 4.5 years

### FOR THE THIRD-PARTY UPGRADER:

**Capital Cost:** \$3.3M  
**Annual Operating Cost:** \$334,000  
**Payback:** 4.5 – 5.2 years depending on finance  
**Benefit:** \$1,407,500 from selling biomethane, bio-CO<sup>2</sup> and large scale renewable energy credits

### Upgrading Technology

It is essential that the upgrading technology used both meets Australian requirements and also allow the recovery of saleable, high-grade CO<sup>2</sup> as a by-product.

- Membrane-based – separates CO<sup>2</sup> from biogas with a selective membrane. This was deemed the most cost-effective method.
- Pressure swing adsorption (PSA) – separates CO<sup>2</sup> from biogas by forcing it under pressure into a solid but highly porous media bed
- Cryogenic treatment – separates CO<sup>2</sup> from biogas by solidifying or liquefying CO<sup>2</sup> under high pressure or in low temperatures.



Using a third party upgrader does add complexity to the situation, it significantly reduces the risk for the piggery, and also allows utilisation of the upgrader's specialist knowledge of the process, and of their existing customer bases to ensure a favourable result for both parties.