

# bellwetheragriculture

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The Committee Secretary  
House of Representatives Standing Committee on Industry and Resources  
PO Box 6021  
Parliament House  
Canberra, ACT 2600

By email: [ir.reps@aph.gov.au](mailto:ir.reps@aph.gov.au)

Dear Sir/Madam

## CASE STUDY INTO SELECTED RENEWABLE ENERGY SECTORS IN AUSTRALIA

We welcome the opportunity to provide input into a new study examining the relative state of development of selected renewable energy sectors in Australia. Further, we are encouraged by the fact that the Committee has broadened the terms of reference to include the Biomass industry.

Bellwether Agriculture Pty Ltd is a privately owned Australian company focused on developing environmentally sustainable, renewable energies with robust commercial outcomes utilising high rate anaerobic digesters. The digester design incorporates closed reactors that use natural microorganism consortia to produce methane and carbon dioxide from biomass such as animal manure, municipal waste etc. Methane can be burned as fuel to generate electricity and the resultant byproduct material used as organic fertiliser.

There are a number of different methods of converting biomass to energy. Our patented technology, IBR (Induced Blanket Reactor) consists of a specifically designed vertical vessel (reactor) which harnesses naturally occurring bacteria to break-down organic waste to produce biogas. In its raw form, gas can be used to power electrical generators, produce heat and provide fuel to power automotive vehicles.

Biogas is produced when organic matter in manure or other organic substrates is decomposed anaerobically, in the absence of oxygen. Biogas typically contains 60-70% methane and 30-40% carbon dioxide; the primary constituent of natural gas and is a clean burning fuel.

The IBR technology is well proven. The distinct advantages of our process are that the numbers of reactors are proportional to the quantity of effluent to be treated, thus scalable. The effluent to be treated enters the reactor continuously at temperature (mesophilic process). A short retention time, 5-6 days produces a high quality gas which is captured, almost all pathogens and odour are eliminated. The byproducts of the process are a natural rich liquid organic fertiliser and a rich natural fibre, somewhat similar to peat moss which is highly sort after as a soil amendment.

A number of IBR facilities are currently operating in the USA generating methane gas from large scale dairy farms for inclusion in the national gas grid. Although gas quality exceeds automotive standards it is used in addition to LPG in vehicles. Other facilities are generating 'green' electricity and are hooked into the local energy utilities.

- **Significant environmental benefit** – Methane gas when released to the atmosphere in its raw form is 20 times more potent than carbon dioxide in trapping atmospheric heat. In the case of dairy cattle, the multiplier effect of one average dairy cow equates to 18.25 tons of CO<sub>2</sub> equivalent. Our technology provides a commercial low cost environmental solution to a number of organic waste streams including, but not limited to;
  - Dairy farms
  - Beef feedlots
  - Poultry farms
  - Pig farms
  - Large central livestock selling centres
  - Abattoirs
  - Food processors, including canneries
  - Dairy processors
  - Municipal sewage
  - Island resorts where electricity is powered by diesel generation
- **Power generation** – The IBR is a continuous flow process, methane is produced 24 hours a day 365 days per year. Excess gas can be stored to buffer between base load and peak loads optimising generation/price efficiencies.
- **Proven technology** – Worldwide, anaerobic digesters have a long history particularly in Europe where a sophisticated high capital cost thermophilic process is used. More recently, spurred on by the price of fossil fuel and environmental concerns farmers in the US have sort alternate methods to ensure self sufficiency in energy. Many progressive farmers are introducing the IBR technology as a responsible practice to reducing their impact on 'greenhouse' emissions. At the same time, recycling water and replacing chemical fertilisers with organic material, a byproduct of the process.

The IBR technology is modular and therefore scalable. Simply, as the demand for more waste process increases we just add more digesters.

In the US, publicly listed Energy Utilities are building centralised depots for smaller farmers, food processors etc., to deposit their organic waste streams. With scale these organisations can efficiently process methane to LNG standard for sale back into the LNG market.

Scalability of the IBR technology has benefits to rural and regional communities. An IBR can be installed to treat municipal waste prior to the traditional waste treatment plant. As a result, electricity is generated back to the community with the byproducts suited for resale as organic fertiliser. The gas is suited as a fuel for motor vehicles fitted with LPG gas conversions. Waste water is treated to Class 'A' for recycling to parks and gardens.

The IBR technology was invented and patented in the USA by Andigen LC., a Utah based company with direct ties to Utah State University (USU). Dr Conly Hansen, USU is credited with pioneering the technology to commercialisation. Bellwether Agriculture Pty Ltd holds exclusive rights over the technology for Australasia, New Zealand and other countries.

- **Competitive production costs** – Our modelling suggests the IBR technology is extremely competitive in today's energy market. The versatility of the process guarantees that there are at least four revenue streams;
  - Energy, in the form of gas/electricity generation
  - Organic fertiliser
  - Carbon Credits
  - Recycled water

Agriculture can contribute to reducing greenhouse emissions. Adoption of technologies such as the IBR will go part way to reducing harmful gas emissions at the same time generating much needed renewable and sustainable energy at either base load or peak demand. Support from the Australian Government into the renewable energy sector would be most welcomed.

Bellwether Agriculture would be pleased to provide additional information to the Committee if required.

We thank you for the opportunity to provide input.

Yours sincerely,



Christopher Davidson  
Managing Director

***Incl.....***

1. Hard copy of this letter
2. CD with Power Point presentation of the IBR process