SENT VIA EMAIL

10 July 2008

Committee Secretary
Senate Standing Committee on Environment, Communications and the Arts
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Sir/Madam,

Re: Senate Inquiry into the Management of Australia's Waste Streams

Carbon Partners welcomes the opportunity to provide the following comments in response to the Senate Inquiry into the Management of Australia's Waste Streams.

1. About Carbon Partners and the Szencorp Group

Carbon Partners (www.carbonpartners.net) aims to be a leading developer of facilities, which generate renewable electricity and a premium fertilizer product from various organic residues (including garden wastes, food wastes, etc) using an advanced and proven anaerobic digestion technology.

Carbon Partners is part of the broader Szencorp Group (www.szencorp.net) a successful property developer and provider of sustainable solutions for the built environment. The Group employs 75 people and has offices in most Australian capital cities and joint venture partners in Thailand and Malaysia.

Szencorp's commitment to a more sustainable future is demonstrated by its corporate headquarters at 40 Albert Road, South Melbourne, currently Australia's highest rated sustainable building (www.ourgreenoffice.com).

2. Anaerobic Digestion Technology – Part of the Solution

Australia currently faces a range of pressing challenges including the need for:

- across the board greenhouse gas emission reductions;
- a significant increase in (baseload) renewable energy generation;
- significant investment and modernisation of our electricity infrastructure[1];
- new processing capacity and more advanced municipal waste processing solutions;

[1] In particular moving towards a more robust and distributed model of electricity generation and supply

- municipal waste processing capacity and moving beyond low-value landfill/composting outcomes;
- structural agricultural industry reform to a more productive, vibrant and drought tolerant industry;
- strategies to combat rising farm input costs (particularly energy and fertilizer);
- improved farm water, waste, nutrient and soil carbon management practices; and
- ongoing regional economic development and employment growth;

Clearly these challenges are complex and immense, requiring an orchestrated set of policy responses, operating over the short, medium and long term. We are pleased that the Australian Government (and the Australian public given the recent election result) appreciate the magnitude of these challenges and the need for action towards addressing them.

Biogas (or anaerobic digestion) technology, a particular class of bioenergy technologies, in which various organic wastes (food waste, lawn clippings, animal manures, etc) are converted into a nutrient-rich fertilizer product and a methane-rich gas (called biogas), from which renewable electricity and heat can be generated.

Biogas technology (and the broader suite of bioenergy technologies for that matter) has been under-represented in the renewable energy debate to date, despite its (i) "ready-to-go" status; (ii) significant deployment potential; and (iii) unique ability to deliver multiple benefits in regard to each of the key challenges identified above[2].

3. Anaerobic Digestion - The German Experience

This potential is clearly demonstrated by the German experience, whereby a range of complementary "whole-of-system" policies were introduced in recent years which led to the rapid/widespread investment in regionally dispersed small-scale biogas facilities, with remarkable results:

- over ***3,700 biogas facilities*** treating municipal & agricultural wastes mostly in regional areas
- almost ***900 MW*** of baseload renewable generation capacity installed in the three years to 2007
- regional economic investment of at least ***€650 million pa*** and the creation of over ***8,000 jobs***
- creation of an entirely new biogas services industry with rapidly growing export revenue

We note that Germany has achieved these results with a net farmed area of approximately ~17 million hectares compared to Australia's ~440 million hectares.

4. Carbon Partners Anaerobic Digestion Technology

Attractive features of Carbon Partners anaerobic digestion waste processing technology, include:

- ***proven:*** it integrates a range of individual technologies with known characteristics, and can be supported by local maintenance suppliers and expertise;

[2] Note that renewable energy from bioenergy sources is the second largest source of renewable energy in Australia with 645 MW of installed capacity (hydroelectricity is the largest source with 7,096 MW of installed capacity) (BCSE 2006).

- ***broad applicability and scalability:*** the technology has been proven on a range of organic waste streams and on various scales;

- ***thermal hydrolysis:*** the incorporation of a thermal hydrolysis step enables the facility to process organic wastes normally not considered suitable for conventional anaerobic digestion processes (ie: green waste and animal/meat wastes), provides bio-security, and significantly higher energy conversion efficiencies;

- ***digester design:*** the innovative two-chamber hydraulic-mix anaerobic digester design, avoids the need for costly mechanical mixing and requires minimal on-going maintenance; and

- ***highly efficient:*** The process is configured to ensure optimum heat recovery and ensuring that over 80% of total electrical generation is available for export off-site. Waste heat is also recovered and reused.

5. Organic Waste Management in Australia

Overview

Australia urban areas generate significant and steadily growing streams of organic waste streams including food waste and garden organics.

The majority of these wastes are disposed into landfill, which leads to the generation of methane, a potent greenhouse gas with a warming potential 21 times that of carbon dioxide. In fact landfill methane emissions to atmosphere accounted for approximately 2.7% of Australia's total greenhouse gas emissions in 2003, equivalent to 15 million tonnes of carbon dioxide equivalent pa[3]. In addition the placement of organic waste into landfills can lead to other potential impacts in terms of loss of local amenity values, odour, leachate, vermin, and surface/ground-water contamination issues.

Whereas the use of urban waste streams for bioenergy purposes achieves benefits including:

- extending the life of existing landfills and avoid/defer the need for new landfill construction;
- significantly reducing the water use, local amenity and environmental impacts of existing landfill and composting operations;
- generate of high value soil conditioners and organic fertilisers; and
- can reduce waste transport costs/impacts, as these facilities can be located closer to or within major urban centres compared to the current alternatives

Current Urban Waste Management Practices

Urban waste management practices varies considerably across Australia. Municipal household waste collection services typically comprise either a two-bin service (mixed waste and dry recyclables) or a three-bin service (mixed waste, dry recyclables and garden waste). Businesses not covered by the municipal waste collection system typically make their own arrangements with private contractors for waste collection and disposal/recycling as appropriate.

[3] "Australia's National Greenhouse Accounts 2005", Australian Greenhouse Office 2007. This report states that 2003 Australia's total GHG was 545 million tonnes CO2e pa, with solid waste disposal on land accounting for 14.9 million tonnes CO2e pa

The mixed-waste streams are typically disposed to landfill and the dry recyclables stream is sent to facilities for sorting and separate recycling. Garden waste streams are typically composted into garden mulch and soil products of varying quality for resale. At certain times of year the markets for such compost products can be oversupplied resulting in depressed product sales/pricing and excessive stockpiles[4]. In Victoria, the EPA has introduced compulsory licensing of composting facilities in response to numerous odour complaints from residents surrounding existing facilities.

In 2002/03, 17.4 million tonnes of waste was sent to landfill, of which approximately 9.5 million tonnes pa consisted of various organic materials, such as food wastes, lawn and garden wastes, paper, cardboard, wood, timber, etc (refer to the table provided below for details).

Organic Waste Generation in Australia 2002/03[5]

	generated tonnes pa	recycled tonnes pa	landfilled tonnes pa	% recycled
paper & cardboard	5.0 million	2.31 million	2.7 million	46%
garden organics	3.8 million	1.55 million	2.25 million	41%
food & other organics	3.2 million	0.3 million	2.89 million	10%
wood/timber	2.1 million	0.44 million	1.63 million	21%
total organics	**14.1 million**	**4.6 million**	**9.5 million**	**32%**

Most Australian State and Territory government jurisdictions have waste minimisation policies in place. Victoria, New South Wales, South Australia and the ACT have mandated waste diversion targets from landfill (at least 65% diversion from landfill by 2014).

Achievement of these diversion targets will require a marked increase in organic waste processing capacity, particularly using more advanced technologies which generate higher-value, marketable products such as renewable energy, soil conditioner and/or organic fertilizers.

Anaerobic digestion technologies such as that provided by Carbon Partners can play a significant role in achieving such diversion targets, particularly given that the waste segregation, collection and transport infrastructure required is largely in place and operating currently.

The Key to Establishing a Plant

The key to establishing a bioenergy facility such as that proposed by Carbon Partners using urban waste is to secure sufficient waste volumes under a single long-term contract, which typically requires the consolidation of waste from a number of local government municipalities. Given this it is not overly surprising that the development of these facilities has only occurred where there has been tenders offered by a coordinated group of local government entities (or a state government entity acting on their behalf).

Other issues faced by project proponents include the fierce competition exerted by the incumbent operators to keep new players from entering the market and the lack of funding to demonstrate new technologies and their applicability to urban waste streams, which would in

[4] Refer to Compost Australia's submission to the Productivity Commission Inquiry into Australian Waste Management Practices (www.pc.gov.au/__data/assets/pdf_file/0018/22176/sub055.pdf)

[5] Data obtained from "Potential For Greenhouse Gas Abatement From Waste Management and Resource Recovery Activities in Australia", Warnken ISE; "Waste and Recycling in Australia", September 2007.

tum build confidence in local and state government authorities to move to higher order waste processing and bioenergy outcomes.

6. Carbon Partners Status

Carbon Partners flagship project is the Renewable Energy Dandenong (RED) Project to be located in Dandenong South. Note that **both the EPA Works Approval and Town Planning Permits have been secured for this facility** (refer Attachment A for more detail).

Carbon Partners Facilities are highly capital intensive requiring significant volumes of input organic waste material (usually much more that a single municipality would generate) secured under a medium-to-long term contract in order to be commercially and financially cost effective.

Despite having EPA and Town Planning approvals in place, this issue has been and continues to be the key factor in preventing the forward progress of the RED Facility. Aggregation of the waste supply from a number of municipalities is essential to supporting the delivery of advanced waste processing facilities and hence delivery of waste diversion objectives.

Please do not hesitate to contact me if you wish to discuss any of the above further.

Yours sincerely,

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Attachment A: Carbon Partners Renewable Energy Dandenong Project

Carbon Partners flagship project is the Renewable Energy Dandenong (RED) Project to be located in Dandenong South. The facility will have capacity to receive up to ***140,000 tonnes per annum*** of mixed organic waste, principally comprised of garden and/or food waste from municipal kerbside collections as well as commercial and food manufacturing sources.

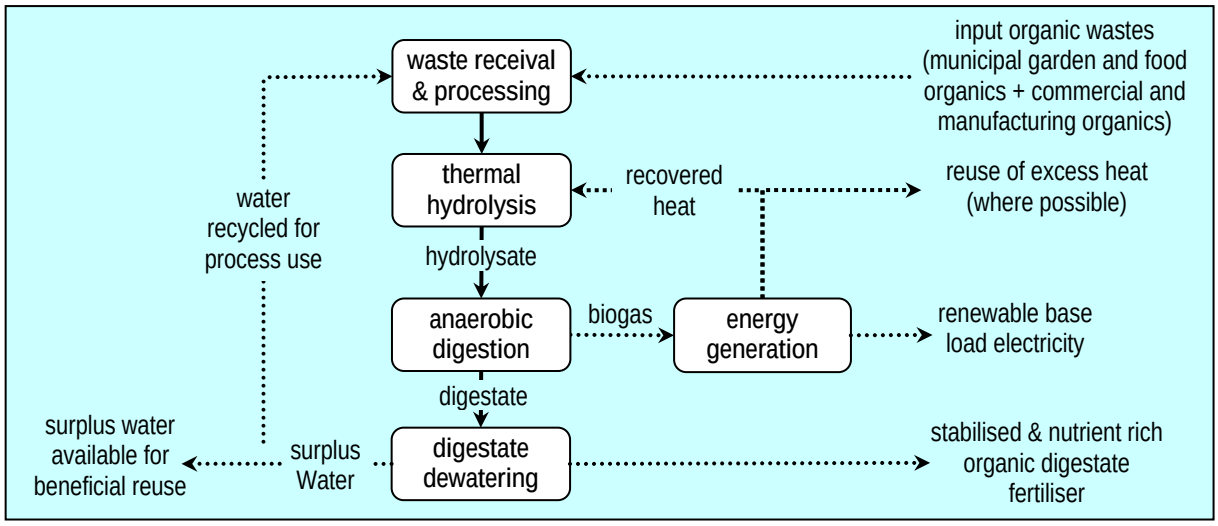
Key RED Facility features include:

- gross installed renewable electricity generation capacity of **6.8 MW**
- net exportable generation capacity of **50,700 MWh pa**
- minimum renewable electricity generation capacity of **43,000 MWh pa** (equivalent to that consumed by **8000 average households pa**)
- generation of **18,000 tonnes pa** of a premium pelletised organic fertilizer product
- audited greenhouse gas abatement of at least **202,000 tonnes CO2e per annum** (equivalent to that generated by **~46,000 average cars pa**)

Note that both the EPA Works Approval and Town Planning Permits have been secured for this facility.

The RED Facility will incorporate the following major processing steps:

1. fully enclosed waste receival and processing (sorting, screening, & temporary storage);
2. waste pre-treatment (thermal hydrolysis);
3. anaerobic digestion (with generation of methane-rich biogas and digestate products);
4. energy generation from biogas (with heat recovery for process use);
5. digestate dewatering, drying (to greater than 85% total solids), granulation, pelletisation and storage for sale as organic fertiliser; and
6. other ancillaries (weighbridge, loaders, offices, educational centre, etc)



RED Facility – Basic Process Schematic

Artists Impression of the Renewable Energy Dandenong Facility

Carbon Partners Pelletised Fertiliser Product