Draft Bioenergy Vision for Tasmania - Consultation Paper

BOC and Optimal Renewable Gas (ORG) Joint Submission

14th February 2022

BOC and Optimal Renewable Gas (ORG) welcome the opportunity to contribute to the development of the Bioenergy Vision for Tasmania by Renewables, Climate and Future Industries Tasmania (ReCFIT).

Operating in Australia for over 80 years, BOC has operations in every state and territory spanning 35 production sites, 850 gas agents and 56 Gas & Gear stores.

BOC supplies compressed and liquefied gases, chemicals, and equipment across the South Pacific region, including Australia, New Zealand, Papua New Guinea, and the Solomon Islands.

In Tasmania, BOC delivers about 50 tonnes/day of Liquified Natural Gas (LNG) to customers that are not connected to the Tasmanian Gas Pipeline (TGP).

The LNG is produced at BOC's Westbury LNG plant using natural gas imported from Victoria.

Optimal Renewable Gas (ORG) is a leading Australian developer of organic waste to renewable gas projects.

ORG's mandate is to deliver biomethane alongside other renewable gases such as green hydrogen and Dimethyl ether (DME) to customers via gas pipeline or virtual gas pipeline.

ORG is planning to develop 10 grid scale biomethane plants in Australia by 2030. By closing the loop between waste and energy, ORG will provide a delivered green gas replacement for natural gas and divert waste from landfill.

In November 2021, BOC and ORG signed an MOU to study the possibility to invest in a biomethane plant with a capacity production of 2.4 TJ/d in Westbury.

The plant will be based on Anaerobic Digestion (AD) technology and will produce biogas using Tasmanian organic waste.

The biogas will be purified to reach natural gas quality (biomethane) and converted in LNG (bioLNG) to be delivered by BOC to Tasmanian businesses.

The bioLNG produced has the potential to be used as green fuel for commercial/industrial vehicles and for ferries.

We strongly believe that Tasmanian organic waste can play a key role in decarbonising hard-to-abate sectors like heat loads and commercial/industrial vehicles that cannot be economically de-carbonized with renewable electricity.

As Tasmania's Bioenergy Visions is finalised, we would be delighted to provide more information or provide a tour of BOC's micro-LNG plant in Westbury, Tasmania.

For more information, please contact:

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BOC/ORG RESPONSE TO DRAFT BIOENERGY VISION FOR TASMANIA

1. What changes, if any, would you suggest to the draft Bioenergy Vision?

BOC/ORG support the Tasmanian government vision to embed bioenergy as a valued renewable resource for the Tasmanian economy, community, and environment as an aid to energy production, waste management and resource recovery, and reduction of greenhouse gas emissions.

2. What are the key roles for the Tasmanian government to support bioenergy?

In addition to the five roles presented in the Bioenergy Vision we believe the following measures by the Tasmanian government would support bioenergy:

i. Levies:

The Tasmanian government should play a key role in creating price signals that will divert the disposal of organic waste from landfill and land-spreading.

Landfill:

Levies are an effective way of providing a price signal to industry to divert organic waste form landfill.

BOC/ORG note this has already been implemented by the government, however we think there is room for improvement to assist industry by jointly funding waste collection sites that allow the collection of larger quantities of waste than can then be transported in bulk transporters thus reducing vehicle movements and the possibility of spillage.

Land-spreading:

Land-spreading is currently one of the cheapest options organic waste generators have to dispose of raw waste.

However, land-spreading is not in the long term an environmentally sustainable method of disposal of this waste as it leads to possible contamination of agricultural land with pathogens, is difficult to control runoff and hence ground water contamination, production of GHG and will often result in problems with odour.

Clearly however there are valuable nutrients in these waste organic streams that can and should be returned to the land.

BOC/ORG believe the best way to do this is through ensuring our anaerobic digesters operate with clean, non-contaminated organic waste streams so that we can produce a dewatered biosolids product that is of high value as a fertiliser ingredient.

The government should facilitate a regulatory framework aiming to ban or cap the amount of organic waste that can be land-spread by the waste producers and introduce a state tax on land-spreading.

ii. Project Funding:

Bioenergy projects revenues are normally associated with the gate fee paid by the waste generator to the bioenergy facility upon acceptance of the organic waste by the latter and the sales of bioenergy and side-products.

Due to the current low disposal costs, waste generators have no incentive to change the current way organic waste are disposed if they need to pay gate fees that are higher than current disposal fees (in some case zero $).

The introduction of a levy on land-spreading and landfill could be used to finance large bioenergy projects (producing more than 1 TJ/d of energy from waste).

The funding could match that which Federal Government agencies offer for similar projects.

iii. Studies:

The Tasmanian agri-food industry community would benefit in understanding the Green House Gas (GHG) emissions associated with land-spreading and composting the two key ways organic waste is re-used in Tasmania.

It is recommended the government sponsor a study to assess the impact on Tasmania GHG emission associated with land-spreading and composting.

3. What are the key roles for households, industry, and other levels of government to support bioenergy?

Household waste represents an important stream of material than can be used forth production of bioenergy.

Currently green bin programs vary from state to state and council to council with some councils going to a fourth bid to allow specifically for household food waste.

Household waste streams also need to be subjected to improved diversionary programs however these will require careful design and planning.

Moreover, contamination of household waste stream will present a problem for bioenergy companies seeking to ensure their biosolids are contaminant free and suited for fertiliser production.

As a result, it is recommended further research of managing these streams be undertaken, combining green waste and food waste all be considered to identify the best method of managing these streams.

4. What do you think could be done to appropriately accelerate the uptake of bioenergy in Tasmania?

BOC/ORG are of the firm view the best method to accelerate uptake of bioenergy is to apply gate fees to landfill, and land-spreading.

All mechanisms of disposal should also be subjected to carbon auditing to identify the true emissions associated with each method.

This will assist in minimising “greenwashing” and will ensure only best practice in terms of emissions reduction.

Any gate fees collected should be directed to assisting the bioenergy industry not in the form of grants but subsidies paid per tonne of waste diverted.

This will send the strongest possible price signal to the market and will assist developers ensure the revenue base.

5. What are the key opportunities for bioenergy in Tasmania? What can be done to realise these opportunities?

Tasmania recovers 77% of the organic waste generated each year (731,000 tonnes), with the remaining 23% (169,900 tonnes) going to landfill. [1]

65 % of the recovered organic waste and landfill organic has energy potential if run through the anaerobic digestion process – equivalent to 10% of the Tasmanian Gas Pipeline (TGP) flow in the 2019-2020 period.

From a carbon emissions point of view, sending organic waste to landfill and/or spreading it on the land has a negative impact on Tasmania carbon emissions.

Indeed, the waste will undergo an anaerobic process releasing CH4 in atmosphere. CH4 is more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere.

Diverting the waste from landfill and land-spreading to Anaerobic Digestion will bring organic waste back into the circular economy in the form of usable energy (biomethane) and maximise the use and value obtained from those organic resources to the benefit of the Tasmanian community.

1) Biomethane conversion of organic waste would reduce Tasmania GHG by converting CH4 emissions from organic waste sent to landfill into biomethane and displacing CO2 emissions associated with the use of 730 TJ of natural gas from gas pipeline.
2) Stores organic waste without posing hazard to the environment.
3) Converts organic waste into energy and stable fertilizer (digestate) with a volume equivalent to 5% of the original waste.

To incentivise Anaerobic Digestion, we encourage the Tasmania government to facilitate the waste diversion from landfill and land-spreading.

This can only be achieved by amending the current and proposed levy structure.

The current plan is to apply a $20/tonne leavy by 2022 for 2 years, after which it will increase to $40/tonne then after further two years to $60/tonne.

BOC and Optimal believe the rollout plan should shorten by 2 years with first 2 years a levy set to $40/tonne and brought to $60/tonne from year three onward.

To minimize land-spreading, the government should ban or put a cap on how much land generators can dispose of via land-spreading.

[1] "*Final draft Tasmanian Organics Research Report"* prepared by the RMGG consortium for Department of Primary industries, Parks, Water and Environment, Tasmania (Nov 2021),

6. What are the key challenges for bioenergy in Tasmania? What solutions do you see for these challenges?

A significant challenge for bioenergy projects is the logistics of the organic waste (collection, transport, and storage).

Tasmania organic waste is spread over a wide area and often the transport of waste is not optimised, increasing the $/tonne cost.

For example, in the aquaculture business some types of wastes are transported not in bulk but in individual sealed bins.

While the bins are a practical way to store the organic waste at the point of generation, they are not effective way to transport the waste over long distance.

In addition, storage of these type of waste (dead fish) can't be done without undergoing to a process of stabilisation.

Due to these limitations bio energy projects could find it uneconomical use fishery waste for their projects.

One way to improve the logistic of the fishery would be to create a central storage facility near the point of generation where waste is unloaded, stabilised, stored, and made available for transport over long distance in the appropriate format.

The government should fund a study on how the improve the logistics of fishery waste and co-fund a storage facility to facilitate the uptake of these type of waste from bio-energy projects.
Another challenge is related to the sale of digestate produced by anaerobic digesters.

Currently the Environmental Protection Agency (EPA) regulates the application of digestate from anaerobic digesters used in WWTP (wastewater treatment plants).

These plants deal with sewage sludge and the digestate produced receives the required treatment and testing and ensuring that the end use is compliant with the EPA requirements.

Because sewage has various chemical contaminants arising from detergents, cleaning chemicals etc the digestate is restricted in terms of is use as a source of nutrient in agriculture.

In Australia, there is no clear regulation on the use of the digestate from anaerobic digesters using organic waste feedstock, therefore we invite the Tasmanian Government to provide regulatory clarity for the digestate since these uncertainties prevent the industry from maximising its use.

It is vital that governments and the EPA recognise disposal of organic waste from large scale agriculture and food production by its very nature avoids contamination of the waste by harmful chemicals and as a result the digestate produced from these anaerobic digesters is not contaminated with such toxic chemicals and in fact is a valuable bioresource.

Specifically, the conditions for using it as a commercial product could be clarified, as well as the specifications of its composition.

The Tasmanian Government should introduce supportive policies enabling cost effective beneficial use of digestate residue from anaerobic digestion.

It is worth mentioning that digestate in addition to being an excellent fertilizer has also carbon sink properties.

It can act has long term storage (around 15-20 years) for carbon when used on the soil as fertilizer.

Digestate can trap carbon longer than composting therefore from a CHG emissions point of view digestate has more value than composting.

Sequestration of carbon in this manner is significantly cheaper and more efficient that sequestration by carbon capture and storage.