Mount Alexander Bioenergy

COMMUNITY Q+A

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CONSOLIDATES ALL QUESTIONS RAISED AND RESPONSES

RESTARTED 1 APRIL

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Questions / Responses

Proposed Mt Alexander Bioenergy Facility

The Q&A document prior to April 2022 has been archived but is available on the MAB website. Some of the questions raised may not be seen as relevant to the existing plans and so a fresh document has been started. There have been advances in the design proposed, the siting of the facility has changed and the development has been staged.

Note that because of similar concerns shared by interested members of the community this document contains some repetition, based on individual questions being asked. We have attempted to combine like questions to contain the size of the document. Should you feel your questions have not been answered please contact us.

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1. The Path Forward

Mt Alexander Bioenergy has decided to stage the development of the proposed facility. Initially it will just be a Biodigester plant that is developed.

While there are significant benefits to be gained from the dual technology facility, it is possible to proceed with the Biodigester as these are common and have been in use worldwide for many years. The pyrolysis technology is in use in many specific and varied forms by a range of installers, and our approach has some way to go before settling on a final design, thus incurring further delay.

We will focus on fast tracking the Biodigester development, seeking permits from the EPA and council for this only at this point.

Once the Biodigester is commissioned it will result in a significant reduction in waste going to landfill and a significant reduction of greenhouse gas emissions. We will introduce a much cleaner way of disposing of DON's meat waste as well as of other wastes.

When the biodigester is up and running, we expect to be better placed to provide an informed update to the stakeholders and community on the recommended course of action for the proposed pyrolysis / steam plant.

2. Technology Overview

This is primarily a renewable energy project, producing some 270,000GJ of renewable energy. The intent of renewable energy is to reduce greenhouse gas emissions by reducing our reliance on fossil fuel generation. By removing waste from landfill and using it as the source, we can make this renewable energy project doubly efficient, with an anticipated Greenhouse Gas saving of 88,500 tonnes CO2e. The technology below, and the selective control of the feedstocks, will ensure that no unwanted emissions result and that is genuine "GREEN" energy. The facility will divert approximately 36,000 tonnes of organic waste from landfill annually.

To put this in its context, the shires total emissions are estimated as 283,000 tonnes CO2e. These are made up of:

- 18,500t Commercial and industrial waste
- 58,000t agriculture
- 59,400t residential
- 147,100t Commercial industrial and government

Anaerobic Digester

The biogas facility will use wastewater and organic waste from Don Smallgoods as well as suitable wasted 'wet' organics to produce biogas using anaerobic digestion. The biogas will be used as natural gas substitute at Don Smallgoods. The wet organics streams at the site will include wasted food organics/by products from food and beverage manufactures and retailers, food waste from cafes/restaurants, a 'wet' component extracted from kerbside FOGO at other

sites, grease trap, and potentially poultry shed wastes and biosolids from wastewater treatment facilities, currently spread on farmland. These materials will be transported in accordance with EPA prescribed waste transport regulations, meaning they will be in sealed and odour-containing vehicles. The facility will upgrade Don Smallgoods wastewater and organic waste systems, reducing odour from existing management facilities. It will also reduce traffic and odour risk from these vehicles from the site. The materials will be received in a negative pressure sealed receival building where air from the building will pumped to air filters to remove odour. The nutrient-rich sludge (digestate) from the AD tanks will be converted into fertiliser by blending with biochar or being dried and used in the pyrolysis plant.

Biomass Plant

The Biomass plant specification will be revisited after the development and commissioning of the AD Plant. To this extent the technology is not locked in. Some generic facts are however certain.

The biomass facility is not a waste incinerator - it will be a pyrolysis plant that heats organics to over 500°C in an airless environment cracking the chemicals in the cellulose to produce, when coupled with a heat exchanger, steam and biochar, a carbon-rich biproduct that can be bagged and sold to the agriculture sector. Trace amounts of wood vinegar will also result. When biochar is ploughed into topsoil it can help retain moisture and sequester carbon. It can also be added to feedstock to reduce cattle's methane emissions. This steam will displace natural gas burnt by Don to produce steam at their site.

The facility will only receive clean source separated dry organic wastes which will be selected from a number of possible sources. These may include woody materials (e.g. untreated timber off cuts from joinery work, single use untreated timber pallets, cuttings) and tree waste from orchards, straw, crop stubble and potentially 'oversize' screened woody mulch from commercial composting sites. None of this will have an odour being dry when received. The facility will also recover energy from unrecyclable quarantine cardboard from Dons, and potentially some unrecyclable quarantine polyethylene plastic from Dons - but this will be determined through the environmental approvals process. The technology can cleanly convert polyethylene back into the natural gas it was manufactured from. Management of this quarantine carboard and plastics at the site will reduce heavy traffic and odour risk associated with vehicles from the site. No other plastics will be considered. No mixed waste will be considered. No toxic waste will be considered.

The Plant Operation

The facility is a small scale wet and dry non-toxic organic waste processing facility. The process is continuous but can be monitored remotely. The facility will be staffed with a single day shift by 3 to 5 employees only. The hours of operation and delivery will be included in EPA and planning approvals.

It is anticipated the addition to net truck traffic (it will reduce loads of waste leaving the Don Smallgoods site) will be three to four additional large vehicles per operating day. The intent is to have supply contracts with waste management companies that will supply consolidated large loads. All vehicle access will be via Walker St and Richards Road south.

While we will be supplied with all of the non-toxic organic waste available from Don Smallgoods, this is insufficient to reach a viable scale. This will meet MASG's objective of providing a better resource management option for such wastes regionally to reduce greenhouse gas emissions.

3. Questions and Answer

Reference	Question	Response
A	**GENERAL**	
1	Why not just the Anaerobic Digester (AD)	*We plan to proceed with the AD plant and consider the Biomass later.* *The Biomass pyrolysis and gasification CHP plant can consume the digestate from the AD which would otherwise be required by EPA to go to landfill and contribute to providing syngas. There is also considerable dry organic waste material going to landfill, including that from Don Smallgoods, that can be used as a feedstock in the biomass plant for generating energy. Combining the two plants enables a zero waste outcome.*
B	**COMMUNITY BENEFIT**	
1	What is in it for the community?	*The MASG community benefits in a number of ways, firstly as there will be a direct dividend paid to a community investment body out of which support can be given to Community Projects, much along the Lines of the Maldon Community Bank, secondly, MASG will receive a direct dividend to support its environmental projects. In addition the community will benefit both directly and indirectly from a more cost effective means of disposing of organic waste and reducing emissions.*
C	**COMMUNITY ENGAGEMENT**	
1	What is the process for community (neighbour) consultation from this point?	*We have a Community Engagement Plan which defines 4 stages. The June 3 and June 4 briefings were the completion of the first stage, "Feasibility Study, Siting and Design". Stage 2, "Bioenergy from Waste Facility Project Development and Approvals", includes community meetings, information sessions, statutory notices of development applications. We have conducted a number of main street Listening Posts on Saturday Mornings.* *Stage 3 is during construction and stage 4 is during operation. Thus we expect that*

		Stage 2 is the one including the elements you request. *Part of the EPA and Council Permit process there will be public meetings. As these permit applications have not as yet been submitted no dates have been set for these.*
2	Listening Posts	*We will restart the Saturday morning Listening posts, probably in August.*
D	**COUNCIL & GOVERNMENT**	
1	Why don't council officers know anything about this	*We cannot answer for the council. Like any householder or business, we take the opportunity to sit down with council planning officers to discuss their requirements. The council environment officer was on the Steering Committee for the Feasibility Study, completed in 2018. The Steering Committee has not existed beyond that. MASG have worked through the site options it presented which has at times involved seeking information from Council Planning and from the Landfill management. Just as, when you as a householder, may meet with planning, these conversations would not be recorded and would not be available to others, until such time as a Planning Permit application is made.*
E	**SITE, OWNERSHIP & OPERATION**	
1	Why this site?	*Our Feasibility Study identified eight potential sites independent of any prior arrangement with the site owners. These were quickly reduced to a short list of four. These were looked at from the perspective of potential grid connection costs, proximity for energy use or export, access for vehicles, suitable land and zoning. All of these but one would have relied on us converting the energy captured as gas into heat to generate electricity with accompanying efficiency losses. The Don Smallgoods site had two great advantages, we could supply the energy in raw form (gas), and we could by-pass the electricity grid and even the gas grid. Don Smallgoods could take all the energy we produced and more and we would not need to export elsewhere. This meant a considerably smaller capital cost, an assured income, and a ready made*

		supply of 20% of our required feedstock. Note the feedstock tonnage planned was such as required to achieve economies of scale. A facility that only processed the Don Smallgoods feedstock was not viable.
F	**PLANNING**	
1	Does the proposal need to go through normal planning processes?	*We have to submit for council's Planning Approval, the EPA approval, Energy Safe Victoria approval and also to satisfy AQIS (Australian Quarantine and Inspection Service) that we are safely handing imported waste. The fact that council have encouraged us as a solution in part to their landfill issues, has no influence when we seek approvals against the planning regulations.* *The Environment Protection Authority will oversee the licensed premises throughout its operating life. Most of the organic wastes transported to the site will also have been regulated and overseen by EPA waste transport tracking systems.*
G	**VISUAL IMPACT**	
1	What will the visual impact be. How high will the buildings and tanks be?	*The building will be low profile with minimal visibility from the road or residents. Tree planting will be undertaken as appropriate to provide screening. Tanks will be largely below the escarpment and buildings will enclose the actual bioenergy machinery. The facility will be behind the mound created by previous excavation fill and not be visible from the north or west. It will be screened by trees enhanced by plantings, from the East. From the South it will be visible but that is over what is already an industrial landscape.*
H	**TRAFFIC**	
1	Traffic volumes?	*We anticipate 3 to 5 employees to be on site for a day shift only. When viewed in comparison to shift change volumes at Don Smallgoods, this is insignificant. Note there may be an overnight operator on-site to monitor the continuous processes.* *The bioenergy plant expects 4 to 5 truck deliveries per day; however, it is estimated there will be a counter reduction in current truck traffic from the DON Smallgoods plant due to a decrease in waste being trucked from the site to landfill. Thus, a nett*

		increase of truck movements would be only 2 to 3. They will only be from and to the south on Richards Rd, not the northern Mary St route.
2	Revised truck numbers	*Recent discussions with a major feedstock suppliers have told us that they ship wet organic waste in 20 tonne shipments. This would increase our daily truck traffic by 1 to between 5 and 6 trucks per day. A net increase from the 3 to 4 of truck movements from the site.*
3	*How did we calculate the number of trucks?*	*At this point we can only go on the advice we have been getting from Waste contractors and others experienced in the proscribed and other waste cartage. There could be variation in this that can only be clarified once we get to finally lock in the feedstock supply. However, to give an indicative figure for truck movements the following calculation has been applied.* *The 22,000 tonne of wet organics planned, less the Don Smallgoods supply 4,500 tonne, leaves 17,500 tonnes that would come by road.* ***That's 70 tonne per day****. Looking at the truck capacity from the likely waste cartage contractors, it seems that these specialised wet waste vehicles can vary from 10,000L to 40,000L. These are not your kerbside lift trucks but bulk wet and liquid cartage trucks. Most wet waste will be high in water content but some less so. We thus expect a litre to equate to a kilogram or slightly less.* *We think it is fair to expect that we would be averaging about 30 tonne per shipment received.* ***That would suggest 2.3 trucks per day****.* *The 13,600 tonne of dry woody waste planned, less the 2,720 tonne provided by Don Smallgoods, leaves 10,880 tonnes to come by road. That's 43 tonnes per day.* *The dry woody waste will be more variable we expect. It is expected to be heavier but more variable in load type and size. However, it won't need the high tech truck transport and we believe a 20 tonne load would be a reasonable assumption. We may have semi-trailers or truck and trailer options, mixed with fixed axle trucks.* ***That would suggest 2.15 trucks per day****.* *We would be accepting full loads only but the number on any given day could vary.*

		Thus, a total of 4 to 5 trucks per day seems reasonable.
4	Traffic on what roads?	*Trucks will be told to approach from the South on Richards Rd and to Exit to South on Richards Rd. This is in line with the council designation of the road as suitable for this traffic.*
5	Can the use of the South approach on Richards Road be enforced	*We anticipate that we will have supply contracts with only a few companies. It may be as few as 1 or at most 4. Contracts with these companies can enforce that this approach is used.*
6	Are staff included for using the south of Richards Rd?	*We expect to have between 3 and 5 staff on site. Generally normal hours will be between 7am and 6pm. Staff will be told to come from the south on Richards Rd and to exit to the south on Richards Rd unless they are Castlemaine residents. Unless staff lived in that Northern area it is not likely they would want to use these north sector roads. The issue would be expected to be with staff coming from outside of the town, such as Bendigo and Harcourt. They will be asked to approach from the south.*
7	What about traffic during construction?	*Construction workers and deliveries will be harder to control because many will be only involved for very short time. They will always be during normal hours, say 7am to 6 pm. However, they will be instructed to use Richards Rd south. We would expect there to be 30 to 40 deliveries over a 6 months period during construction and for there to be up to 30 workers with numbers on site at anytime varying from 5 to 15. We will impose strict control of their working hours in their contracts.*
I	**ODOUR**	
1	We have experienced odour leaks in the past. What can we expect from the Anaerobic Digester?	*Odour cannot be emitted beyond the boundary under the EPA controls.*
J	**EMISSIONS**	
3	What are the emissions?	*There will be a decrease in emissions. The carbon equivalent emissions reduction is*

		88,500 tonne/yr (which was determined by an independent Life Cycle Analysis, LCA study[1] and based on a set of assumptions about feedstock mix and energy off-take requirements in 2017; this will be updated once the final configuration is settled). The pyrolysis-gasification process will have little if no perceptible emissions as this is determined by the feedstock which, in MAB's case, is organic material (timber, saw dust etc.) and not non-organic material (such as rubber) which could otherwise generate emissions). The pyrolysis occurs in what is largely an oxygen-free environment and relies on the volatile gases within the material for combustion, hence the carbon remains as biochar and not released as carbon-dioxide, ash and harmful particulates. Because air pollution control devices (electrostatic scrubbers) are employed, the external emissions from pyrolysis is cleaner than a home wood stove, natural gas stove, or water heater on a per unit basis. MAB has no plans to take materials that can find a higher value elsewhere in the circular economy, have chemical contaminants or can/should be source-separated (such as MSW). MAB does not support incineration. EPA license conditions will require monitoring and reporting of emissions to demonstrate compliance with emissions standards.
K	**NOISE LEVELS**	
1	What will be the noise levels throughout the day?	*They will lie within the Vic EPA threshold guidelines for a bioenergy facility.* *EPA Noise limits – Day = 48 dBA, Evening = 42 dBA, Night = 41 dBA*
L	**TECHNICAL, PLANT & PROCESSES**	
1	Is there a danger of explosions	*These plants will be producing biogas and steam and be displacing an equivalent volume of fossil fuel derived polluting natural gas. A small plant of this size can be easily managed and will comply with the EPA, Council Planning, Energy Safe Victoria, and supported by a Fire management Plan. The biogas will be contained in sealed/*

[1] Proof of Concept LCA, Mount Alexander Sustainability Group, Energy from Waste: Biogas-Biomass Facility, Aug 2018 – prepared by LifeCycle Logic

		airproof tanks, so there will be no open flames on site. The volumes of stored biogas and design of storage tanks would ensure that in the highly unlikely event that could trigger an explosion, this would be averted by flaring this biogas, hence the chimney stack. There would be little to no offsite impact from a brief upward flare of gas rather than a lateral percussive explosion. Management of LPG and LNG gas stored in tanks exists in many places across the Shire, including every service station. *There are gas (methane) explosions in houses and businesses from time to time due to mismanaged leaks, mixing with Oxygen and exposure to flame. In an industrial environment, this is less likely as there is continual inspection, monitoring and maintenance processes enforced. While nothing is impossible, given human error, the siting of this plant would mean no impact beyond the immediate tank site.*
2	Why not composting	*Commercial composting uses power and fuel to shred, screen, aerate and turn /move organic materials and is a net emitter of greenhouse gases. Most food is biodegraded through the composting process, so it contributes little to the organic carbon in the final compost. A lot of the nitrogen in food is also lost as gases during the composting process. The proposed bioenergy facility will recover bio-gas from the decomposition of food and concentrate the remaining nutrients and organic carbon in a 'digestate' sludge that can be used as fertiliser. Most commercial compost facilities generate an unsellable dry woody 'oversize' mulch that has to be landfilled or reprocessed (using more energy). This oversize material could be used by the bioenergy facility if it is clean enough. The conversion of woody organics to a fuel gas and biochar will further reduce greenhouse gas emissions by more than 500 kg CO2-equivalents per tonne, not including the avoided landfill emissions.* *The proposed scale of the MAB project is small compared to commercial composting facilities, and the relatively small amounts of organics it processes will not reduce the availability of compost. It will reduce greenhouse gas emissions by more than if the*

		same organics were composted.
M	**FEEDSTOCK (Waste)**	
1	Wet organic waste	*Wet organic waste will consist of the meat processing waste from Don Smallgoods which will be meat processing off-cuts and wash-down particles. Other meat wastes may be sought elsewhere such as from poultry processors. Clean food waste free (via separator) from non-organic matter, grass cuttings, weeds, etc. These can be filtered for metal or plastic contaminants.*

4. The Proposed Site of Facility

Zero Net Emissions by 2030

Site in 1946 – pre Don Smallgoods Plant

5. The Proposed Facility Layout