

# MAI Engineering Group

8<sup>th</sup> June, 2018

Re: Feedback to Draft Report – Low Emissions Economy

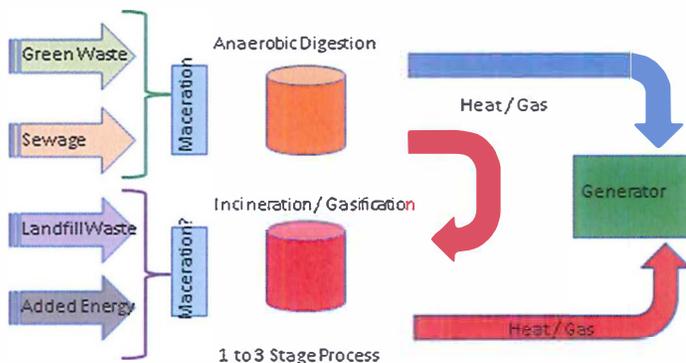
Greetings,

Thank you for this opportunity to comment on the Low Emissions draft Report and offer up observations from over 30 years in the Environmental and Engineering field. Since 1970, my interests have been involved with biomass and harnessing the energy it produces.

I found that most countries around the globe value their waste as an asset, India has been using biomass for energy for the past 100 years – using village level dung pits with inner-tubes to collect methane using it for lighting and cooking. China is well developed also with this ability. New Zealand would be prime to adopt this proven technology with an abundance of manures – the costs to accomplish these systems is well affordable, just needing a small economic push to get things moving.

Reviewing the draft report inspired me to hope that New Zealand will actually take biomass seriously and provide support for innovation – not only at the university level, but primarily at a local village, Marae, and farm level. My comments are rooted in small scale systems to address energy and emission challenges at the local and regional level.

## Waste to Energy – Process Concepts



Utilizing waste for energy accomplished two clear and immediate advantages: 1) producing additional energy from sources discarded by the community: green waste, feces, sewerage, landfill waste, etc. – free and readily available.

2) Cleaning the environment: simultaneously as we use waste for energy, we are removing pollutants and emissions from the environment.

While the current solution sounds simple, present day off-the-shelf costs are somewhat prohibitive for the small town, farm or Marae level. As a NZ Professional Chartered Engineer working on a proposal to the Kingdom of Tonga, I see a cost of \$20M to produce two to four megawatts of electricity from 75 tons/day (100m<sup>3</sup>) landfill waste. This would be enough to power approximately 250 to 500 homes.

As this does not seem the best economy for electricity production, I am sure we can do better than this. Our Group is working in this area to develop small to medium size Waste to Energy (WtE) systems at affordable prices. We are held back by small barriers here in NZ that other countries already have in place – such as government incentives and funding schemes.

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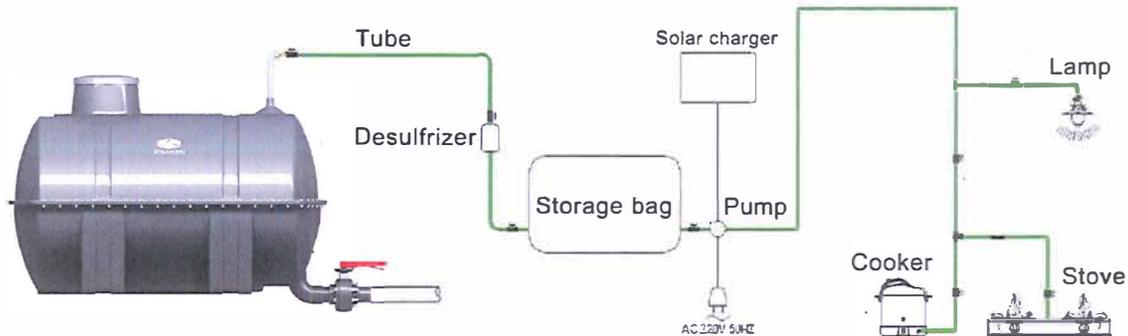
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As more cost effective processes become available at the local village level, the size and economic costs are reduced by magnitudes of scale. Presently the New Zealand biomass industry struggles with a huge gap to implement small to medium systems.

We stand at the threshold where small incentives would create tremendous opportunities! Simultaneously these systems provide **electricity production, gas / heat production, AND clean up the environment - all at the same time.**



We see micro-scale biomass addressing small hobby level projects, and larger populations addressed with large industrial sized reactors. Yet the small to mid-sized community systems are still not developed or deployed. This is such a huge need within our country.

I want to strongly support and encourage the underpinning elements identified in the Draft Report:

- *Harnessing the full potential of innovation and supporting investment in low emission activities and technologies:*
  - Provide grant funding for the development of small localized or regional systems to provide Waste-to-Energy electricity to the surrounding community as well as reduce or eliminate the need for additional landfill. Waste treatment sludge could be used for power generation rather than being wasted to landfill.
  - Provide no-interest loans for developing emissions reducing products or systems – with emphasis on small scale waste to electrical production.
- *Creating laws and institutions – acting as a commitment device for future Governments:*
  - Expand the exiting duties of the Bioenergy Association to help it develop a Technology Transfer - Public Outreach Centre. Communities could be visited and informed of possible projects and their cost/benefits to provide the community with reliable power from their sewage waste and landfill waste – all while reducing emissions.
  - Formally acknowledge the existence of small and mid-scale emission reduction projects as viable partners and participants in national emission reductions. A large number of small to medium scale projects will be more effective than one large reactor. This will also win hearts and minds of the population at large as they will witness benefits first hand; both for electricity and landfill elimination.

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- Develop a formal Marketplace to allow for the sale and purchase of smaller emission benefits (mini-ETS?) – a place where smaller emission reducers are given credits or incentivized to implement and run small scale systems through “credits” given for each Kilowatt hour provided from landfill waste. There could also be credits to be able to sell electricity back to the grid at a fair price. Presently a small system operator would face more roadblocks than encouragement.
- *Ensuring other supportive regulations and policies are in place to encourage an inclusive transition:*
  - Lower building permit thresholds to allow research and experimentation with on-farm small scale digesters and waste reduction projects.
  - Formalize a system to provide clear value added to projects that reduce or eliminate waste streams. Government rebates or tax reductions on successful systems or local enterprises.

Thomas Jefferson, the third president of the United States held the philosophy that if each citizen was strong and self sufficient, then the nation as a whole would be strong and self sufficient. I believe that encouraging and supporting small and mid-size emission reduction efforts will provide great benefit collectively for success in New Zealand.

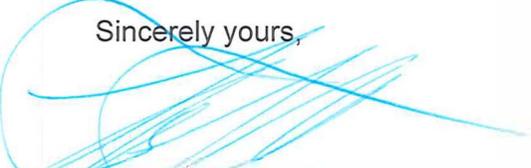
Using village level waste products for village level energy needs would also simultaneously reduce transportation emission levels.

In Summary, I believe the key issues are best expressed as:

1. Waste to Energy exists as a proven technology in the world – it would only need a “kick-start” to get the ball rolling here in New Zealand to gather momentum for it to be embraced in the communities.
2. The present technological trajectory is slow and long. Many innovators find it difficult to go against the “norm” of larger businesses and government bureaucracies that stifle entrepreneurship trying to connect into the national grid. The question now is how to speed this process up?
3. There is a need to formally recognize small scale waste to energy systems to legitimize their efforts. Government should be working to try to inspire local community systems – as they can both supplement and backup the national providers. Just think what New Zealand would look like if most communities had a local system capable of producing electricity from waste. Overnight the country would be energy rich and cost savings would reverberate through the community.

Thank you for your consideration. Please contact me if I can be of service.

Sincerely yours,



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