

15 November 2019

Interim Climate Change Commission
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Wellington 6140
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SUBMISSION: Call for evidence on options available to reduce greenhouse gas emissions over the period 2022 to 2035

Background

Enerkem appreciates the opportunity to provide evidence related to our patented thermochemical recycling process that converts carbon contained in non-recyclable waste into valuable products. This technology can significantly support NZ in meeting its greenhouse gas emission reduction targets over the period 2022 to 2035, and beyond to 2050.

Enerkem is a Canadian company established in 2000 that is commercialising a globally competitive technology which uses non-recyclable municipal solid waste to produce low cost liquid transportation fuels and chemicals which are direct substitutes for fossil derived fuels.

The evidence presented in the attached submission is focused on introducing the Enerkem proprietary technology to the NZ waste and renewable liquid fuels markets and providing high level indications as to what this technology could deliver to NZ in terms of greenhouse gas emission savings.

Summary of Submission

- Enerkem has one of the world's first waste to biofuels commercial facilities operating in Edmonton, Alberta, Canada. This facility receives 100,000 dry tonnes of non-recyclable Municipal Solid Waste (MSW) from an integrated waste processing facility from the City of Edmonton. The plant has the capacity to produce 38 million litres of cellulosic ethanol per year. The integration of this biofuels plant with other waste management processes (recycling, composting etc) has led to a 90% reduction of the waste sent to landfill.
- The Enerkem technology is supported by over 100 patents.

- Some examples of major commercial projects currently being progressed by Enerkem include:
 - *Rotterdam Waste-to-Chemical Consortium* – Located in the Port of Rotterdam, this project comprises two production lines with an input of approx. 360,000 tonnes of sorted waste materials which will produce 270 million litres of bio-based methanol per year. Project partners include Air Liquide, Nouryon, the Port of Rotterdam and Shell
 - *Varenes, Quebec, Canada* – one production line processing around 180,000 tonnes of waste, producing 135 million litres of methanol or ethanol per year. This plant will also have a green hydrogen source which markedly improves the carbon conversion and hence the product yield of the biofuels plant.
 - *Ecoplanta el Morell, Spain* – Located in Tarragona, two production lines processing 360,000 tonnes of waste material producing 270 million litres of product. Project partners include Suez.
- By using non-conventional waste feedstocks (i.e. MSW and waste wood feedstocks) to produce biofuels and renewable chemicals, Enerkem offers an attractive value proposition. This is driven by:
 - Modest process conditions (i.e. lower temperature, pressure and energy requirements than alternatives)
 - Compact design enabled by Enerkem’s modular and standardised approach to engineering and construction
 - Low or negative value feedstocks

The New Zealand Case

- Based on the quantities of waste available from a city such as Auckland, preliminary calculations indicate that it would be feasible to establish a standard two production line Enerkem waste-to-methanol and/or ethanol plant in NZ. Such a plant would process 360,000 tonnes of sorted waste diverted from landfill into approx. 270 million litres of product.
- If this methanol or ethanol was substituted for fossil fuels, this could be blended with gasoline at a level of up to 15%. The total production of this facility would equate to approximately 50% of the total biofuel blend for the entire country’s gasoline supply.
- CO₂ emission reductions could be expected to be in the vicinity of 300,000 – 500,000 tonnes CO₂e/year (depending on the alternative waste management options -These indicative estimates would need to be verified based on more detailed information for a specific NZ project)

Conclusion

Enerkem would be pleased to discuss in greater detail how its technology could contribute to New Zealand's GHG reduction targets and to address any questions ICCC may have on this submission.

Sincerely,

A handwritten signature in black ink that reads "Andrea Redford". The signature is written in a cursive, flowing style.

Andrea Redford
Chief Business Development Officer, Enerkem

Enclosure: PRODUCING SUSTAINABLE FUELS & CHEMICALS FROM MIXED WASTE – A Solution for New Zealand