

**REPORT TO ENVIRONMENTAL SERVICES COMMITTEE
MEETING OF WEDNESDAY, OCTOBER 21, 2020**

SUBJECT Enerkem Facility Update

ISSUE SUMMARY

To provide an overview of the Enerkem gasification facility.

BACKGROUND

At its September 16, 2020 meeting, the Environmental Services Committee requested that staff report back on the Enerkem technology for processing municipal solid waste. Staff have met virtually with David Zheng, Commercial Development Coordinator at Enerkem. This report provides a summary of the Enerkem Technology from publicly available information and information provided by David Zheng.

Enerkem is a company that aims to produce renewable methanol and ethanol from non-recyclable, non-compostable waste through a gasification process. Feedstock can include solid waste, plastic waste or biomass residues. The waste recovery process uses “advanced gasification” to react the feedstock material at high temperatures to generate pure syngas, methanol and ethanol. These products can then be further processed to generate renewable chemicals or transportation fuels. In addition, at least three levels of solids are produced, a small percentage of which are considered hazardous. A processing and transfer facility, along with facilities to process waste that can’t be gasified, are also necessary to fully process the feedstock materials.

The first Enerkem facility, the Enerkem Alberta Biofuels Commercial Demonstration Facility (EAB), was constructed as part of the Edmonton Waste-to-Biofuels Initiative between 2013 and 2014. The initiative is a partnership between the City of Edmonton, the Government of Alberta, through Alberta Innovates–Energy and Environment Solutions, and Enerkem. According to information on the City of Edmonton website (Appendix A), the project includes three facilities:

- Integrated Processing and Transfer Facility, owned and operated by the City of Edmonton with an approximate capital cost of \$40 million,
- Waste to biofuels and chemicals facility owned and operated by Enerkem Alberta Biofuels (EAB) with an approximate capital cost of \$100 million,
- Advanced Energy Research Facility owned and operated by the City of Edmonton with a capital cost of \$11 million.

Also located on the site are a recycling centre and a composting centre.

The Enerkem facility has a contract with the City of Edmonton to process up to 100,000 dry tonnes of municipal solid waste per year for 25 years. The EAB commercial demonstration facility is designed to produce up to 38 million litres per year of biofuels. The facility started producing ethanol in 2017 and is currently focused on maintaining continuous operations using a mixed waste feedstock, before maximizing the volume of material being processed. A recent partnership

between Enerkem and Suncor has brought in the Suncor management team to support the operation of the EAB commercial demonstration facility.

A second Enerkem facility is currently under development in Varennes, Quebec, incorporating the learnings from the EAB commercial demonstration facility into the design of this second facility. There are also several other facilities in the feasibility or development phases globally. According to Enerkem, the optimal size of the technology is a two-train gasification plant of 350,000 tonnes per year of post recycling municipal and/or industrial, commercial and institutional waste (220,000 dry tonnes/year). In 2019, Hartland accepted approximately 145,000 tonnes of municipal solid waste. To obtain further information about the Enerkem Technology, process effectiveness and costs, the Capital Regional District would need to enter into a non-disclosure agreement. This information could be reported back to the committee in a closed report.

CONCLUSION

The Enerkem technology uses gasification to process waste into syngas, methanol and ethanol. Enerkem currently has a commercial demonstration facility in Edmonton, Alberta, and other plants in development, including one in Quebec. The optimal plant size to achieve economies of scale is approximately 350,000 tonnes of municipal solid waste per year. To obtain further information about the Enerkem Technology to better understand their process effectiveness and costs, the Capital Regional District would need to enter into a non-disclosure agreement.

RECOMMENDATION

The Environmental Services Committee recommends to the Capital Regional District Board:

That this report be received for information.

Submitted by:	Russ Smith, Senior Manager, Environmental Resource Management
Concurrence:	Larisa Hutcheson, P. Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

ATTACHMENT

Appendix A: City of Edmonton Factsheet – Waste-to-Biofuels Initiative