

ABSTRACT

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Advanced biorefineries for waste diversion and circular economy: the case of Enerkem

Using innovative waste conversion process can help communities meet their local recycling and waste diversion objectives while contributing to decarbonize the transportation sector, as well as transition to a circular economy.

This presentation will talk about how advanced biorefineries are creating value from non-recyclable waste by converting them into renewable fuels and chemicals. These facilities are a sustainable alternative to landfilling and incineration and are complementary to recycling. They offset dependence on fossil fuels, create high-quality jobs while reducing greenhouse gas emissions.

Enerkem's patented biorefinery process chemically recycles solid waste materials into a synthetic gas which is then transformed into methanol and ethanol using catalysts. The technology has been implemented at full-scale in Edmonton, Alberta, after many years of development and validation. The objective is to help the City of Edmonton increase its household waste diversion rate from above 50% today to 90%, and Canada meet its biofuels mandate with locally-produced advanced biofuels while diversifying and greening its economy.

The Enerkem Alberta Biofuels facility in Edmonton is the world's first major collaboration between a large city and a waste-to-biofuels producer to address waste disposal challenges, and to commercially produce, and sell methanol made from garbage. It will also be the first to commercially produce advanced ethanol from garbage when the addition of its methanol-to-ethanol unit is completed in 2017.

"We are proud that municipalities around the world are looking at the City of Edmonton and the Enerkem facility to see how they too can divert waste from landfill while producing clean fuels and chemicals through this innovative technology." – Mayor Don Iveson, City of Edmonton, Alberta

This model can be replicated in other areas. The company is developing cellulosic ethanol and renewable chemicals production facilities in North America and globally, as turnkey projects or as joint ventures with partners, and based on its modular and scalable manufacturing approach.

In 2017, the company will begin the construction of a new facility in Varennes, Quebec. It is also developing a similar project in Rotterdam in The Netherlands with a Waste to Chemicals Consortium that will include the Port of Rotterdam, AkzoNobel, AVR, Air Liquide, Van Gasenwinkel and Enerkem. This future chemical plant will use Enerkem's innovative technology to recycle the carbon in residual waste into methanol, a raw material used in the chemical industry. The methanol will then be converted into chemicals such as acetic acid (e.g., for fibers and adhesives), thickening agents and dimethyl ether (clean propellant gases). This project will be located in the Port of Rotterdam, and is aligned with the Dutch Government's ambitious plan for the circular economy.