

**MEMORANDUM**

**WMPSC-C 2-2021**

**Subject: Alternative Waste Management Technologies Update**

**Date: Monday, February 22, 2021**

**To: Waste Management Planning Steering Committee**

**From: Brad Whitelaw, Program Manager, Policy & Planning**

---

As per PW 41-2015 and the May 30, 2016 Waste Management Planning Steering Committee (WMPSC) meeting, this memorandum is intended to provide Committee members with an update on alternative waste management technology projects and related initiatives (i.e. Energy-From-Waste (EFW), Mixed Waste Processing (MWP), Anaerobic Digestion (AD), etc.). Staff have been monitoring new and emerging alternative disposal technologies, along with existing projects for future consideration over the past several years. Staff provide updates on these alternative waste management technologies, at least annually, or when there are significant updates.

**Background**

- Originally, as part of Niagara Region's Long Term Waste Management Strategic Plan (LTWMSP), and then subsequently as a stand-alone project, Council approved completion of a review and issuance of a Request For Proposal (RFP) for a scientific review of alternative diversion and disposal technologies, including analysis on viability and sustainability and recommendations for next steps.
- In 2013, an RFP was awarded to HDR Inc. to perform a comparative assessment of alternative waste and biosolid management technologies. The aim of this assessment was to determine which technology or combination of technologies would be viable for implementation in Niagara Region.
- In mid-2014, this project was subsequently deferred for one year due to a number of considerations (see PW 41-2015) and subsequently was terminated by Council. It would instead be included, as part of a future LTWMSP, with a comprehensive stakeholder engagement process.
- An RFP for the completion of a future LTWMSP will be released in early 2021.

- Niagara Region continues to engage other neighbouring municipalities in discussions related to available capacity at their current/future alternative waste management technology facilities and/or future needs that could be addressed by partnering on alternative technologies.
- Niagara Region continues to participate in the Municipal MWP Working Group, which has the objective to “identify collaboration opportunities and specific information needs, actions and timelines, in order to determine the feasibility of jointly implementing waste management policies, programs and/or facilities, which includes alternative technology facilities”.

## Overview

Provided below is an update on municipal and private alternative waste management technology facilities across Canada, and related Provincial waste reduction legislation, subsequent to what was previously reported in WMPSC-C 34-2019 – Alternative Waste Management Technologies Update, October 28, 2019.

## Summary of Municipal and Privately-Owned Alternative Waste Technology Facilities Across Canada

Provided below is an update on municipal and privately-owned alternative waste technology facilities implemented across Canada, subsequent to what was previously reported.

**Table 1 – Municipally-Owned Facilities (owned by a municipality and operated by a third party)**

Municipality/ Facility	Type of Technology	Update
Durham-York Energy Centre (DYEC) and Covanta	EFW	<ul style="list-style-type: none"><li>• Covanta designed, built, operates and maintains the DYEC, on a 20-year contract term, plus optional term extensions of up to 10 years.</li><li>• DYEC’s maximum waste thermal treatment rate is currently set at 140,000 tonnes per year (tpy).</li><li>• The nominal electricity generation rate is 17.5 Megawatts, and the nominal steam generation</li></ul>

Municipality/ Facility	Type of Technology	Update
		<p>rate is approximately 67,200 kilograms per hour.</p> <ul style="list-style-type: none"> <li>• In June 2019, the Regions of Durham and York began the Environmental Screening Process to increase the amount of waste processed at the DYEC by 20,000 tpy, for a total of 160,000 tpy.</li> <li>• A streamlined Environmental Assessment to increase the DYEC permitted capacity from 140,000 to 160,000 tpy will be submitted spring 2021, for approval.</li> <li>• The gross capital costs for the DYEC project amount to \$284.2 million; this includes \$255 million for construction of the facility and approximately \$29 million for the Environmental Assessment, permitting and approvals, site servicing, consulting fees and economic development activities in the host community of Clarington.</li> <li>• The 2019 estimated annual operating costs were approximately \$16.8 million. This cost is shared between Durham and York Regions, based on the quantity of waste each Region delivers to the DYEC.</li> <li>• The operating costs are funded through the revenue generated from the sale of electricity (\$8.7M), sale of recovered metals (\$488K), and the Solid Waste Management budget.</li> </ul>
Metro Vancouver Waste-to-Energy (WTEF) and Covanta	EFW	<ul style="list-style-type: none"> <li>• Metro Vancouver owns the WTEF and Covanta operates it, on their behalf, under a long-term operations and maintenance contract.</li> <li>• Since their organics ban was introduced in January 1, 2015, the Mixed Solid Waste</li> </ul>

Municipality/ Facility	Type of Technology	Update
		<p>(MSW) processed at the WTEF has decreased from 280,000 tpy to approximately 253,000 tpy in 2019.</p> <ul style="list-style-type: none"> <li>• In 2019, the WTEF recovered and sold approximately 6,000 tonnes of ferrous and non-ferrous metals. This also provides secondary ferrous metal recovery (i.e. aluminum, zinc, brass, stainless steel, and copper).</li> <li>• In 2019, the total operating cost for the WTEF was approximately \$20.5 million. 2019 disposal costs were \$2.0 million.</li> <li>• In 2019, Metro Vancouver earned approximately \$5.8 million in revenue from the sale of electricity, and \$0.2 million from the sale of recycled metals, the bulk of which was used to produce reinforcing steel.</li> <li>• The WTEF generates enough electricity to power 16,000 homes per year.</li> <li>• In 2019, the net cost to operate the WTEF was \$57.45 per tonne.</li> </ul>
Halifax Regional Municipality Otter Lake Waste Management Facility	Mechanical Biological Treatment (MBT)	<ul style="list-style-type: none"> <li>• From April 2019 to March 2020, the Otter Lake Facility received a total of 46,125 tonnes of residential waste, of which 39,947 tonnes was landfilled (difference in tonnage excludes metals, papers and pop bottles, which were recovered).</li> <li>• Total operating costs for the MBT Facility during this period were \$6.0 million.</li> </ul>
City of Toronto Dufferin Biogas Utilization Project	AD	<ul style="list-style-type: none"> <li>• The City of Toronto, in collaboration with Enbridge Gas Inc. (Enbridge), is installing biogas upgrading equipment at the Dufferin Solid Waste Management Facility.</li> </ul>

Municipality/ Facility	Type of Technology	Update
		<ul style="list-style-type: none"> <li>• The infrastructure will allow the City and Enbridge to convert the biogas that is produced from processing Toronto's Green Bin organic waste into renewable natural gas (RNG) and inject this gas into the natural gas distribution grid owned and operated by Enbridge.</li> <li>• Once in the grid, the City can use the low-carbon fuel to power its waste collection trucks and other vehicles and/or heat City buildings and facilities.</li> <li>• This project is one of the first of its kind in North America and will allow the City to significantly reduce its greenhouse gas (GHG) emissions.</li> <li>• Current estimates suggest that the Dufferin RNG facility will process 55,000 tonnes of organics per year, and produce approximately 3.3 million cubic metres of RNG per year.</li> <li>• The first green molecule of RNG is expected to flow by late 2020.</li> <li>• The total project cost for the Dufferin Biogas Facility is estimated to be \$16.3 million.</li> <li>• The next facility to receive RNG infrastructure will be the Disco Road Organics Processing Facility.</li> <li>• The City has also identified other potential RNG production opportunities, for consideration, at two of its landfill sites (Green Lane and Keele Valley).</li> <li>• Through these four sites, it's estimated that the City could produce approximately 65 million cubic metres of RNG per year – the</li> </ul>

Municipality/ Facility	Type of Technology	Update
		equivalent in GHG emission reductions of taking 35,000 cars off the road for a year.

**Table 2 – Summary of Current and Proposed P3 Facilities** (owned and operated by a private company, but agreements with municipalities to supply waste)

**a) Current P3 Facilities**

Municipality/Facility	Type of Technology	Update
City of Edmonton and Enkern Alberta's Waste-to- Biofuel and Chemical Facility	Gasification, Cleaning and Conditioning of Syngas, Catalytic Synthesis and Product Purification	<ul style="list-style-type: none"> <li>Edmonton's Waste to Biofuels and Chemicals Facility is the world's first commercial-scale waste-to-biofuels facility of its kind and is designed to turn household garbage into biofuels and renewable chemicals.</li> <li>The facility is built, owned and operated by Enkern Alberta.</li> <li>Using Enkern's proprietary technology, it aims to convert 100,000 tonnes of municipal solid waste into 38 million litres of biofuel annually to help Alberta reduce its GHG emissions.</li> <li>After initially producing just methanol, the facility installed a new process to produce ethanol in 2017.</li> <li>The goal of producing methanol and subsequently ethanol has economic and environmental benefits.</li> <li>The annual cost to operate the Enkern facility is proprietary information.</li> </ul>

**b) Proposed P3 Facilities**

Municipality	Type of Technology	Update
Durham Region	MWP and AD	<ul style="list-style-type: none"> <li>• In June 2019, Durham Region obtained Council approval to proceed with construction of a mixed waste transfer and pre-sort facility and an AD organics management processing facility (utilizing a wet technology), under a design, build, operate, and maintain (DBOM) public-private partnership contract.</li> <li>• In May 2020, Council gave approval to continue negotiation of a joint venture/co-ownership agreement with Epcor Utilities Inc. for the development of the Region's Mixed Waste Pre-Sort and AD facility.</li> <li>• The Request For Quotation (RFQ) closed December 1, 2020.</li> <li>• In 2021, Durham will be reviewing RFQ submissions and issuing the RFP in the fall.</li> <li>• The Mixed Waste Pre-sort AD facility with an EFW plant, will be a first-of-its-kind, fully integrated waste management initiative in North America.</li> <li>• This system will convert food scraps into RNG and will use the residuals to generate electrical energy that can be used in a variety of applications.</li> <li>• The proposed AD process will be odour and emissions free, due to the facility operating under negative pressure and using bio-filters to remove the odour causing components.</li> <li>• The AD facility is anticipated to divert approximately 30,000 tonnes of organics from the DYEC, annually.</li> </ul>

Municipality	Type of Technology	Update
		<ul style="list-style-type: none"> <li>The upfront capital costs to build both facilities, including land, are estimated to be approximately \$164 million.</li> </ul>

**Table 3 – Summary of Privately-Owned Facilities**

Facility	Type of Technology	Update
Escarpment Renewables Bio Digester, Grimsby	AD	<ul style="list-style-type: none"> <li>In September 2019, the former Grimsby Energy Inc. Bio Digester facility was sold to White Owl Ltd., a privately-owned company based in Markham.</li> <li>White Owl Ltd. is the holding (parent) company of Miller Waste Systems Inc. and Escarpment Renewables.</li> <li>Miller Waste Systems Inc. provides feedstock, engineering and operational support to Escarpment Renewables.</li> <li>The facility processes food waste and various liquid waste feedstocks, such as sugar waters, fats, oils and grease (FOG), and dissolved air flotation (DAF) sludge.</li> <li>The current annual tonnage is 23,000 MT, and the facility utilizes two continuous stirred-tank reactor (CSTR) digesters, each with a volume of approximately 2,000m<sup>3</sup>.</li> <li>As it is in the commissioning phases of facility upgrades, a processing fee is not available.</li> <li>The facility has the ability to generate up to 1.0MW of electricity using the biogas that is produced.</li> </ul>



Facility	Type of Technology	Update
Southern Alberta Energy from Waste Association (SAEWA)	EFW	<ul style="list-style-type: none"><li>• Established in 2009, the non-profit SAEWA is a coalition of 66 municipal entities and waste management jurisdictions in southern Alberta</li><li>• Its mission is to research and implement energy recovery from non-recyclable waste materials in order to reduce long-term reliance on landfills.</li><li>• In 2019, SAEWA received 11 Expressions of Interest (EOI) to compete to host an EFW Facility.</li><li>• After an extensive scientific process of review &amp; analysis of the potential sites, a preferred site was successfully selected in co-location of the Newell County Landfill. SAEWA are receiving business proposals coming forward wanting to work with them to see the project concept come to commercialization.</li></ul>

### **Municipal MWP Working Group:**

The Municipal MWP Working Group, which Niagara Region is currently a member of, meets annually to discuss and share information on various MWP initiatives. Due to COVID-19, the Working Group did not meet in 2020.

Provided below is an update from the Municipal MWP Working Group members on their current initiatives:

#### **i) London:**

- London's Waste to Resources Innovation Centre (WRIC) currently operates using four existing locations:

- 1) Materials Recovery Facility (including an approved area for recovery/ waste management demonstration projects)
- 2) City Hall
- 3) Institute for Chemicals and Fuels from Alternative Resources (research institute within Faculty of Engineering at Western University)
- 4) Western University

- The WRIC currently has activities in five main areas:

- 1) Research & Development
- 2) Training, Testing and Auditing
- 3) Resource and Waste Management Knowledge Exchange
- 4) Technology Demonstrations
- 5) Outreach and Engagement

- In late October 2019, London launched their Hefty Energy Bag Pilot Project at 6,800 homes, in five areas of the City. The purpose of the project was to:

- 1) Divert more plastics from landfill (i.e. juice & food pouches, chip & snack bags, meat & cheese bags, pet food bags, fruit/vegetable bags, etc.)
- 2) Reduce the amount of plastic being mismanaged
- 3) Advance towards a more circular plastics economy and more sustainable future

- Due to COVID-19, this pilot was delayed from March 2020 until October 2020. It re-started in October 2020, and will be completed in September 2021. The pilot was also re-launched in smaller, more manageable areas.

ii) **Oxford County:**

- In 2021, Oxford County will be starting high level planning for organics diversion (i.e. Source-Separated Organics vs. Facility-Separated Organics) in order to meet the 2025 targets established in the Provincial organics policy statement.

iii) **Peel Region:**

- The RFP process is underway for an AD facility to process Peel Region's Green Bin organics.

- The DBOM contract will be awarded in 2021, and the AD facility should be operational by 2024.
- On June 18, 2020, Peel Region's Waste Management Strategic Advisory Committee (WMSAC) directed staff to report back with information on how a MWP Pilot fits into the Region's long-term waste management strategy, including timing, scope, costs, risks, outcomes, and options for procurement.
- Peel Region prepared a REOI for a MWP Pilot Project, which was released on December 24, 2020, and closes on January 29, 2021.
- Peel Region staff reached out to other municipalities to discuss potential partnering opportunities.
- In November 2020, Peel Region staff invited municipalities to attend a meeting, which described Peel's MWP Pilot Project. Niagara Region staff participated in this meeting.
- Niagara Region contacted Peel Region staff in mid-January to express Niagara's potential interest in participating in the MWP Pilot Project.
- Although Niagara's level of participation is still to be determined, it may potentially include supplying material and/or receiving pilot data results. Further details will be identified over the next several months.
- Peel Region staff will report back to the WMSAC with their findings and recommendations pertaining to project timing, scope, costs, risks, outcomes, and options for procurement of a MWP pilot.

**iv) Simcoe County:**

- Simcoe County has no plans, at this point, to pursue MWP technology. Instead, the County will be keeping abreast of developments in the MWP field.
- Simcoe County is pursuing the development of its waste management facility (ERRC - Environmental Resource Recovery Centre), which has two major components: an Organics Processing Facility, and a Materials Management Facility or waste transfer facility for garbage and recycling.
- Simcoe County has selected a site and are currently pursuing the necessary Official Plan and zoning designations.

**v) Toronto:**

- Solid Waste Management Services staff took a report to their Infrastructure and Environment Committee in March 2020, outlining the findings of their MWP Study to date.

- As a result, the scope of study was expanded to include MWP with thermal processing. To date, waste characterization audits, waste forecasting and a jurisdictional scan have been conducted.
- Solid Waste Management Services staff will continue to research the topic and have committed to report back with updated findings to Toronto City Council by the end of 2023.

vi) **Waterloo Region:**

- Waterloo Region continues to monitor the activities of larger municipalities with respect to alternative technology initiatives, at this time.

vii) **York Region:**

- By approving their 2020 Update to the SM4RT Living Plan, York Council endorsed the recommended strategy of transitioning to AD through procurement of 20-year contracts at privately-owned processing facilities.
- York Region is currently in the process of developing the RFP to procure these contracted processing services. The timeline for releasing the RFP has been extended due to COVID-19. York Region is currently aiming to issue the RFP by April 1, 2021.

**Provincial Waste Reduction Legislation:**

Provincial waste reduction legislation may impact the amount of tonnage to be directed to alternative technology facilities, and will require additional consideration by Niagara Regional Committees/Council, in terms of services and facilities that Niagara will continue to operate under a producer responsibility framework.

**Provincial “Made-in-Ontario Environment Plan” (Plan) Update:**

- On October 19, 2020, the Province released a proposed new Blue Box regulation under the Resource Recovery and Circular Economy Act (RRCEA), for comment.
- Under the proposed regulation, the producer shall establish a collection and management system of designated materials and producers may be interested in having municipalities provide Blue Box services on their behalf, should mutually agreeable terms be negotiated.

- Under the proposed regulation, recovered resources that are used in incineration or used in a product that is fuel or a fuel supplement are not accounted for, or reported on, in respect of a producer's management requirement (i.e. the total amount of Blue Box materials producers must divert) for a material category.
- Niagara Region provided comments on the proposed new regulation, for submission to the Ministry of Environment, Conservation and Parks (MECP), as part of PW 48-2020, November 10, 2020.
- Staff will continue to provide reports to Committee with further updates on the proposed legislative changes.

i) **Provincial Food and Organic Waste Framework Update:**

- On September 30, 2020, the Province posted the proposed amendments to the Policy Statement on the Environmental Registry of Ontario, for a 45 day public review period, which ended on November 14, 2020.
- Niagara Region generally supported these proposed amendments, which were included in PWC-C 43-2020, November 10, 2020.
- Additional guidance will be provided by the Province to municipalities in the coming months regarding implementation of the Policy Statement.

**Summary/Conclusions**

Based on a review of the Municipal MWP Working Group members, the majority are not considering EFW, at this time, for various reasons, including:

- A decision was made to monitor EFW, but not to implement at this time (Waterloo, Simcoe);
- The EFW technology was not included, as part of their long-term waste strategy (London);
- The decision was made to focus on organics (AD) diversion (Durham, Oxford, Simcoe, Peel and York).
- Toronto will be including MWP with thermal processing, as part of their MWP Study, which is expected to be completed by the end of 2023.

Niagara Region will be assessing EFW, as part of its upcoming LTWMSP.

Respectfully submitted and signed by

---

Brad Whitelaw, BA, CIM, CPM, P.Mgr., CAPM  
Program Manager, Policy & Planning