# The Regional Municipality of Durham

## Addendum to the Committee of the Whole Agenda

Council Chambers
Regional Headquarters Building
605 Rossland Road East, Whitby

**Wednesday, January 19, 2022** **2:30 PM**

**Note: Additional agenda items are shown in bold**

1. Roll Call

2. Declarations of Interest

3. Statutory Public Meetings

   There are no statutory public meetings

4. Delegations

New **4.1 Linda Gasser, Durham Resident, re: Organics Management Solution Update (2022-COW-2) [Item 7.B)]**

New **4.2 Wendy Bracken, Durham Resident, re: Organics Management Solution Update (2022-COW-2) [Item 7.B)]**

5. Presentations

5.1 Gioseph Anello, Director, Waste Management Services, Works Department, Kelly McDermott, Senior Solicitor, Legal Services, Corporate Services Department, and Barb Goodwin, Director of Financial Solutions, Utility Finance & Portfolio Management, Finance Department, re: Organics Management Solution Update (2022-COW-2) (Item 7.B)

6. Correspondence

New A) **Correspondence from Linda Gasser, Durham Resident, re: Organics Management Solution Update (2022-COW-2) [Item 7.B)]** **3 - 155**

**Recommendation:**

**Refer to the consideration of Report #2022-COW-2**

7. Reports

   A) Durham Diversity and Immigration Program and Durham Local Immigration Partnership – Transition to Diversity, Equity and Inclusion Division (2022-COW-1)

   B) Organics Management Solution Update (2022-COW-2)

8. Confidential Matters

   There are no confidential matters to be considered

9. Other Business

10. Adjournment

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January 17, 2022.

Sent via Email as Correspondence to Committee of the Whole via Durham Region Clerks at: clerks@durham.ca

Chair John Henry and Regional Council
Regional Municipality of Durham
605 Rossland Rd. E., Whitby ON

Re: Staff report 2022-COW-2 – background documents from Peel and York Regions and City of London re Mixed Waste Presort and Anaerobic Digestion

This letter provides background documents explaining the various components of Durham's "AD Project" which includes a Mixed Waste Presort aka a Dirty MRF as well as an Anaerobic Digester.

I have signed up to delegate to COW on January 19th on the above noted staff report however, in five minutes I won't have the time to provide sufficient context for the points I wish you to consider.

**Organics Processing at Other Municipalities**

The City of Toronto processes their Source Separated Organics (SSO) at two anaerobic digesters.

Both Peel Region and York Region looked at plans to process their SSO at Anaerobic Digesters. Peel staff wanted a Region owned AD. York Region has determined that contracted capacity at private sector ADs meets their requirements and provides better value.

**Peel Region**

Peel was looking at a Region owned facility, which I learned on January 13, 2022 via news article found at link below, had been cancelled by their council last year.

*After weighing options for an organic waste facility since 2017, Peel Regional council quietly scrapped the approved $124 million project last year with next to no public engagement……Councillor Star confirmed with The Pointer two reasons for the cancellation of the plan, due to an "increase in costs" and "newer systems being more advantageous". " With new technology, we think that we can come up with something a lot better" Star told the Pointer."*

Brampton Pointer article found at: https://thepointer.com/article/2022-01-13/public-left-in-the-dark-as-peel-quietly-cancels-124m-organic-waste-facility

From some documents embedded in links within The Pointer article (the site will not let me copy text so I attach contents via screen shots) , you will also see that statements about lack of private sector capacity were challenged.

I don't know the status of Peel's MWP **pilot** project but your staff could follow up and get this information.

See Peel Region Nov. 30.2017 Report - pdf page 41, Appendix III of attachment:

*Product Quality*
*…….The organic output of Mixed Waste Processing may not consistently meet product quality*
*requirements, particularly for heavy metals, so long as items of household hazardous waste are*
*present in the garbage. This risk could be minimized by expanding or enhancing programs or*
*policies to eliminate these materials from the garbage*

**City of London Staff Report April 20.2021**

Contamination issues around FSO was identified by both Peel Region and the City of London.

The latter did an evaluation of MWPs including the Canadian experience, North American and European. Worth reading the 24 page report at: https://pub-london.escribemeetings.com/filestream.ashx?DocumentId=80154 From page 4:

*A review of file information, reports and on-line sources suggest that there are a very limited number of mixed waste or partially mixed waste processing facilities operating in Canada at this time. Available details (Appendix B) suggest that at least 10 facilities have either closed or were re-engineered away from mixed waste processing. Many of these facilities were older, first generation facilities. The Halifax Regional Municipality has recently proposed to close (December 2020) the Front End Processor/Waste Stabilization Facility (FEP/WSF) that has been in operation since 1995. It remains in operation, but its future is uncertain. The City of Edmonton is operating a facility to create refuse derived fuel from mixed waste to send to the Enerkem gasification system. In Nova Scotia, Sustane Technologies (pyrolysis technology) has been processing mixed waste since 2019. These are likely the only three facilities managing a mixed waste stream in operation in Canada. This does not include technologies that combust waste, with and without energy recovery. Experience in the United States is very similar (Appendix B). Most first-generation, mixed waste processing and composting facilities have closed or have been reengineered to meet newer program needs (e.g., acceptable lower diversion and recovery rates, more stringent end product quality, etc.). A few, newer facilities have been established in the last five years and are developing a proven track record. However, a few newer facilities have also been closed or re-engineered as the original design was not meeting performance or contractual requirements.*

**London's Appendix B review of MWPs starts on Page 16.** A similar overview should have been provided to you but has not been to date.

**York Region**

York Region did an evaluation of options to process their SSO in Appendix B (March 2020) to their Solid Waste Master Plan, and concluded that private sector capacity. From Appendix B summary at:
https://www.york.ca/wps/wcm/connect/yorkpublic/0349503d-6426-48e2-9c8c-1d2cab293f64/Appendix+B+Summary+Long+Term+Source+Separated+Organic+Waste+Processing+Plan.PDF?MOD=AJPERES&CVID=n3FA5jS

"*Study concludes that procurement of long-term contracts with privately owned AD facilities provides the highest overall value to the Region*."

Complete Appendix B "Summary Long Term Source Separated Organic Waste Processing Plan" can be found at:
https://www.york.ca/wps/wcm/connect/yorkpublic/3e97de1d-be2d-47a2-8415-8f7e148f5413/Appendix+B+-+Final+Report-Long+Term+Source+Separated+Organic+Waste+Processing+Plan.pdf?MOD=AJPERES&CVID=n5r9Onv

York Region Bid for Private Sector AD capacity:
https://york.bidsandtenders.ca/Module/Tenders/en/Tender/Detail/176127d6-ccf6-4d0f-afc5-15829e05113b

| | |
|---|---|
| Bid Classification: | Services |
| Bid Type: | RFP |
| Bid Number: | P-20-276 |
| Bid Name: | York Region Organic Waste Transportation and Processing Services |
| Bid Status: | **Closed** |
| Published Date: | Mon Jun 7, 2021 3:00:00 PM (EDT) |
| Bid Closing Date: | Fri Nov 5, 2021 1:00:00 PM (EDT) |
| Question Deadline: | Sat Sep 18, 2021 4:30:00 PM (EDT) |

The Work includes:
• Transportation of Source Separated Organic Waste (SSO) from the Region's Transfer Stations to up to two (2) Primary Processing Facilities owned and operated by the Contractor.
• Processing SSO by Anaerobic Digestion to produce Energy Product, Soil Amendment Product, and Residue, as defined. Processing shall occur at the Primary Processing Facility or Facilities and up to six (6) Supplementary Processing Facilities.
• Marketing of Energy Product and Soil Amendment Product.
• Transportation and disposal of Residue

Durham Region

Durham originally considered an AD for processing Source Separated Organics and Multi Res; however, Durham does not collect enough SSO tonnage in their green bin to justify building their own AD. There were a series of studies commissioned by Waste staff from about 2013 -2017– none posted publicly with only some now posted on AD webpage, this long after I had to request these via Freedom of Information requests.

Over time Durham's focus veered to finding ways to obtain enough total organics tonnage by including a Mixed Waste Presort and mechanically extract organic materials from mixed waste, to justify their preferred choice of Durham owned AD.

Durham staff have also studiously avoided considering low cost and proven to be effective options like Clear Garbage bags, which help sorting at source AND getting out hazardous waste, to name a few of many benefits.

Durham staff have not to date provided a systematic analysis as to how Mixed Waste Presort operations elsewhere that might operate and extract organics in the way Durham staff envision.

Durham's final draft of their Long Term Waste Management Master Plan (LTWMP) depends heavily on the AD Project though staff did not bother to update their organics tonnage projections to show actual data from 2020, which surpassed their 2020 projection. Instead of the LTWMP going to Works as it did last week, where it was essentially rubber stamped, it should have been on the Jan. 19th COW agenda together with report 2022-COW-2. This would have provided additional context to help you understand both documents.

Durham staff have been pursuing Organics Management that is predicated on an MWP -aka "Dirty MRF" and Anaerobic Digestion. Staff claim they intend to process "facility separated organics" (FSO) extracted at the MWP separately from the green bin SSO until such time it could be determined output could meet relevant guidelines. Find this described in paragraph 2 on page 2 of attached Nov 24, 2020 correspondence from your waste director to me. Please think for a moment about the logistical implications of processing two separate organics lines, because of the prospect of contaminated FSO.

Recall that from the first meeting in June 2017 when Durham staff brought forward their "Organics Management Strategy", that supporting documents like consultant studies and preliminary business cases were NOT provided to council and the public. Again I had to submit FOI requests to get a number of documents.

Recall on May 27, 2020, when Durham staff went directly to Council with Report 2020 COW 20, seeking approval for MWP and AD – instead of going to Committee of the Whole as originally stated – when asked a direct question by a councillor asking for examples of MWP operating elsewhere as Durham's would, neither the Works Commissioner nor the Waste Director nor any of Durham's consultants who might have been present, provided the details re MWP requested. But the majority of Council voted

to support the staff recommendations – this at time the estimated price tag was around $200 million.

Little supporting data provided about MWP facilities Durham's consultant may have audited or what his findings were – see DR/GHD July 8. 2020 PowerPoint attached.

Having said that during Covid, Durham's SSO tonnage increased in 2020. If staff statements of around a 60% capture rate are accurate, Durham could improve capture rates and collect more SSO tonnage. Some shifts may become permanent, in terms of more people preferring to work and learn remotely and with more cooking at home more often than in the past.

Please recall when a Miller representative made a presentation to Council a few years ago and offered to build an AD to process Durham's SSO. Miller was clear they were NOT interested in processing FSOs.

**Durham's Report 2022-COW-2** mentions: "anticipated bid premiums due to reduced market tolerance for project risks". You should ask exactly what this means. It would not be unexpected that bidders will find it difficult to know exactly how contaminated Durham's black garbage bag contents would be and what impacts that would have on the final product. Ask how many bidders/who qualified in addition to the final three selected by your staff.

Your Waste staff should stop fantasizing about "energy" projects and evaluate options, inform council so they could understand how options achieve approved objectives and settle on the most cost effective and least environmentally/socially damaging options around Solid Waste Materials Management. There is no silver bullet but there are options far superior and less risky than what your staff propose.

Recall the staff recommended, council approved incinerator has been an ongoing source of problems including emissions exceedances. Durham's actions around withholding LTSS dioxins emissions data as just one example has eroded public trust in the willingness of Regional staff and Council to make decisions and act in the public interest. Your incinerator is to undergo a major overhaul this year according to staff statements at the Nov. 29. 2021 meeting.

With your so called "Made in Durham" disposal solution i.e. your incinerator, in addition to the tonnes of pollutants and greenhouse gases your burner emits to air, you also send approximately **60,000 tonnes of residuals to landfills outside Durham per year** – this consists of both bottom and fly ash from the incinerator as well as bypass waste and unacceptable/unprocessible waste.

Your staff appear to know even less about the multiple risks associated with Mixed Waste Presort and the logistics of overseeing operations of both a MWP and AD, not to mention they have not stated how they intend to manage/where they intend to send the residuals from the MWP e.g. contaminated recyclables and the non combustible fraction.

“Fool you once”, then shame on Durham staff for not providing enough details for councillors to understand the issues and the project risks posed by what staff have been proposing.

But, the majority of Durham councillors have asked very few questions, moving this AD project at every juncture by supporting staff recommendations starting with Report 2017 COW 180 through to 2022-COW-2, the latter contemplating an estimated 20% increase over what they asked you to approve in May 2020.

Durham residents deserve better. Staff comments that the only option to MWP and AD is to expand the incinerator is ridiculous. As for the “potential” to get subsidies to offset the crazy costs being contemplated, consider that this could be desperate wishful thinking.

Peel Region Council eventually regained control and killed staff incinerator dreams in 2015 and the AD last year.

It’s long past time Councillors got serious about informing themselves, asking the right questions and putting a stop to this ill considered, risky and expensive project. Imagine yourselves trying to explain your support for this dud on the campaign trail next summer.

Direct staff to get moving on effective and less risky organics options that keep the focus on source separation and source separated organics processing.

Thank you for your attention.

Yours truly,

Linda Gasser

111 Ferguson St. Whitby

Encl. Jan. 13. 2022 Brampton Pointer Article Peel Region Council cancelling AD.

July 8. 2020 G. Anello/GHD PowerPoint re MWP

Nov. 24. 2020 G. Anello letter to L. Gasser -organics processing etc.

Nov. 30. 2017 Peel Region Staff Report incl. re MWP.

April 20. 2021 City of London Staff report -overview of MWP

https://thepointer.com/article/2022-01-13/public-left-in-the-dark-as-peel-quietly-cancels-124m-organic-waste-facility

Site prevents copying article – series of scans of article text from above link. Can access docs referenced from links within article, at link above.

# Public left in the dark as Peel quietly cancels $124M organic waste facility

*By Natasha O'Neill*
*Jan 13, 2022 - Brampton, Mississauga*

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After weighing options for an organic waste facility since 2017, Peel Regional council quietly scrapped the approved $124 million project last year with next to no public engagement.

The anaerobic digestion facility (or renewable natural gas centre) was set to revolutionize the way Peel collects green bin organics. It was supposed to sit at 125 Orenda Road in Brampton and divert 90,000 tonnes of waste from Peel landfills.

Since 2017, the Region has been increasing the amount of organic waste given to Emerald Energy, which operates a waste management facility used in Mississauga. That year, Peel gave Emerald 3,449 tonnes of waste, and the volume soared to 11,632 tonnes in 2019. The pandemic created a slight decrease to 10,179 tonnes in 2020, which is still over the 10,000-tonne agreement with Emerald.

The anaerobic digestion facility was a crucial step in creating more landfill space for the increasing population and expanding the green bin program to allow other household items like diapers and pet waste.

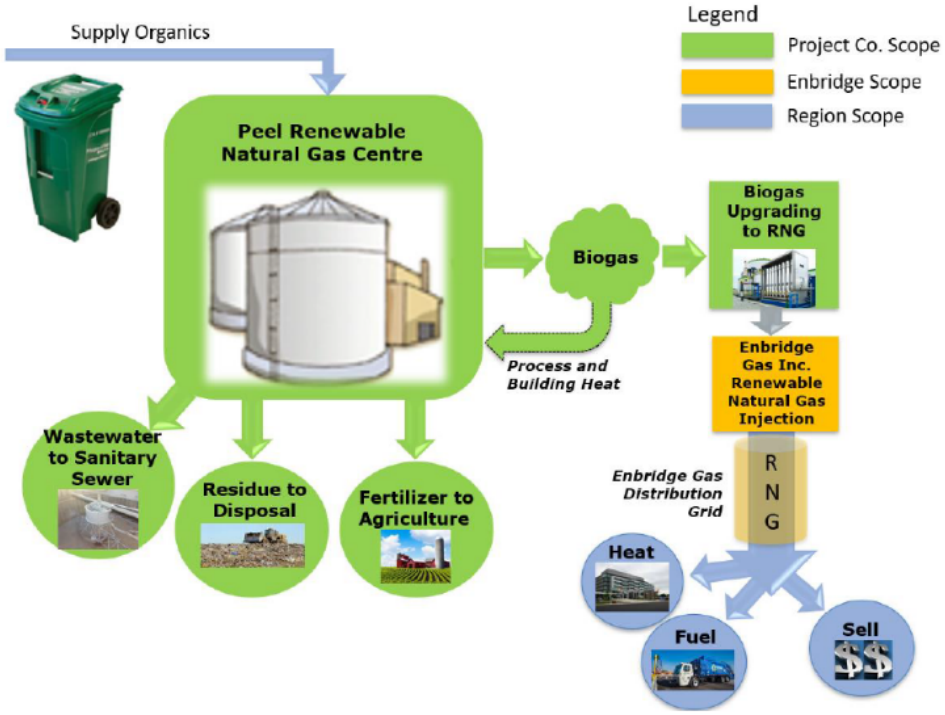
According to Regional staff, "the scrapping of the anaerobic digestion facility does not significantly impact the lifespan of the landfill as it was going to replace the Region's existing composting system and use of merchant organics processing contracts."

The Region entered into an agreement with Enbridge Gas Inc. to operate the renewable natural gas (RNG) centre on the same site, owned and operated by Enbridge, which would have transformed waste into gas to be put back into the Ontario energy grid. The process of breaking down the matter and creating biogas is called anaerobic digestion.

The Region entered into an agreement with Enbridge Gas Inc. to operate the renewable natural gas (RNG) centre on the same site, owned and operated by Enbridge, which would have transformed waste into gas to be put back into the Ontario energy grid. The process of breaking down the matter and creating biogas is called anaerobic digestion.

The residue left over from the waste is used as fertilizer.

*Figure 1 - Roles in Delivering the Anaerobic Digestion Facility*



**The waste plan would see Peel benefit greatly from a new facility and harness methane gas into a renewable energy source.**

*(The Region of Peel)*

May 27, weeks before the plan was cancelled, Norman Lee, Peel's director of waste management, provided an update to council on the numerous benefits of the new facility and next steps. The project was touted as a grand solution to Peel's waste issues and for years had received the optimistic support of council members, who through votes approved the various steps of the plan. At the time, the RFP phase (to attract a successful private partner to build the facility) had closed and staff were accessing the bids.

"It takes a long time to go through these processes and to make something happen," Councillor Jennifer Innis said at the May 27 meeting, urging expediency. "And the longer we take the more money it will cost."

Lee concluded his presentation with a slide explaining that council would receive a recommendation report on July 8 and all agreements with the successful bidder would be finalized October 2021.

However, at the July 8 Peel Region Council meeting, a communication from Jim Nardi, a senior consultant with Anaergia, a waste conversion company, advised the Region against pursuing the $124 million facility.

In a letter addressed to Councillor Ron Starr, chair of the public works and waste committees, Nardi stated, "The $124M digester will replace the existing in-vessel composting facility originally built in 2007. The primary driver to construct the AD (anaerobic digestion) facility is the need to increase the total waste diversion rate above 70%, and the AD will allow recycling of pet waste and diapers via pre-processing technology."

Nardi's letter continued.

"However, as Peel prepares to award a contract to build and operate its new AD facility, there are serious concerns about the costs involved that justify further review in light of alternative, cost-effective models."

So, at the eleventh hour, after years of planning and after the RFP's bidding process had ended, another private company suddenly advised scrapping the whole plan.

At the same July 8 meeting, when Nardi put forward his company's last-minute position, another last-minute communication was included on the agenda, this one from a duo of waste management companies, Cornerstone Renewables and ProWaste Solutions. Though the letter is marked "Confidential" in a watermark, it was included on the public portion of the agenda.

It stated: "Cornerstone and ProWaste are submitting this unsolicited proposal today and are pleased to provide the Regional Chair Nando Iannicca, the Chair of the Waste committee Ron Starr and all Council members an immediate long-term, cost-effective solution for the Region's SSO (Source Separated Organics) today and into the future."

The unsolicited pitch went on.

"In collaboration, Cornerstone and ProWaste Solutions are driven to provide the Region of Peel a comprehensive, minimal risk, long term solution that achieves the Region's Anaerobic Digestion (AD) goals for their Source Separated Organics (SSO). Over the last five years and more recently the last two months we have been listening to council meetings and staff reports on the updates to the Regions (sic) plans on building their own AD facility to process their SSO. After taking note to councillor Ron Starr's questions too (sic) staff for clarification and concerns on the AD project and staff's responses with an emphasis there is no processing capacity in the marketplace, Cornerstone/ProWaste felt compelled to submit to the Region this proposal and informed opinion to shed some much-needed light and clarity on processing capacity in the marketplace."

The informal offer letter stated: "Our pricing will most certainly save the Region hundreds of millions in capex and millions in processing costs over the lifetime of the contract. Our network of reliable AD facilities already exists, built when the price of material was significantly less expensive and meets all current regulations. As a reminder Cornerstone already accepts and processes approximately 20,000mt annually of the Region's SSO with a clean record of meeting all of Peel's contractual obligations and environmental guidelines; This solution enables the Region to expediate the achievement of all its goals in a significantly faster timeline."

It's unclear if regional staff or council have considered the offer or if it played a part in the sudden scrapping of the $124 million plan.

When the issue of cancelling the project and tearing up the RFP was unexpectedly raised at the July 8 meeting (when a recommendation report was supposed to have been brought forward by staff so a bidder could be selected and all agreements could be finalized by October) the matter was placed on the in camera agenda, away from the public, meaning decisions and the possible contemplation of costs from bidders were dealt with out of the public's view. In this meeting that barred public input, and was supposed to decide the partner for the $124 million project, council instead heard recommendations from staff and suddenly scrapped the project.

It's possible that bids came in much higher than the estimated price.

The minutes of the meeting state: "That the Request for Proposal 2019-287P to Design, Build, Operate and Maintain the Peel Renewable Natural (RNG) Centre (the "Request for Proposal") be cancelled in accordance with its terms; And further, that the Region pay up to $200,000 in fees to Enbridge Gas Inc. for the studies and design work required for the RNG injection station in accordance with the Backstop Letter Agreement dated January 31, 2020 between Enbridge Gas Inc. and the Region."

Councillor Starr moved a motion, seconded by Mayor Patrick Brown, to pay Enbridge Gas Inc. $200,000 for the study, design and work on the RNG injection. Members of council then voted in favour of the motion, except for Councillors Gurpreet Dhillon and Annette Groves who abstained and Councillor Dipika Damerla who was absent.

No communication was put forward from the Region explaining to taxpayers the cancellation of the project or what alternatives are being considered. The snap decision was made after years of work and planning, leaving climate change and waste diversion targets up in the air.

Regional staff told The Pointer in an email Peel is, "assessing organics processing options and exploring the development of a mixed waste processing pilot project."

It's unclear why this was not considered before the RFP process was initiated years ago.

Councillor Starr confirmed with The Pointer two reasons for the cancellation of the plan, due to an "increase in costs" and "newer systems being more advantageous."

"With the new technology, we think that we can come up with something that's a lot better," Starr told The Pointer.

He has been assured by staff that plans for a facility are still in the works, and the process won't take as long since a lot of the groundwork has been laid.

The Region has a goal to divert 75 percent of organics away from the landfill by 2034, a bold target to assist broader climate change goals and to address the landfill capacity issues. In 2018, the last year for which data is available, the Region was hovering at about a 50 percent diversion rate. The addition to the green bin program of pet waste and diapers, will divert 25,000 tonnes annually from the landfill.

In a May 20 staff report, the facility was called, "one of the most impactful projects," Peel has pursued to "demonstrate progress towards greenhouse gas emission reduction targets."

Currently, the Region is using thermal energy, which burns organic materials. Burning food waste takes a lot of energy, especially because of the high quantity of water within the products. Breaking down organic waste in a digestion facility is more fuel efficient because it can create natural gas, whereas incinerators need to dry products out to create steam energy.

Starr told The Pointer he hopes to see an updated report from staff in the first quarter of 2022 on the next steps for the facility.

It's unclear if the unsolicited offer to use existing private facilities will be considered.

Whether the public will be better informed remains to be seen.

Reducing, reusing and recycling organic matter will continue to happen at the current organics facility used by the Region of Peel, for the time being.

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**Twitter: @taasha__15**

See also: https://thepointer.com/article/2021-05-27/region-takes-steps-to-build-waste-facility-crucial-to-meet-climate-targets

## Report to Civic Works Committee

**To:** **Chair and Members**
**Civic Works Committee**
**From:** **Kelly Scherr, P.Eng., MBA, FEC**
**Managing Director, Environmental & Engineering Services, City Engineer**
**Subject:** **Update on Resource Recovery Strategy Including Mixed Waste Processing**
**Date:** **April 20, 2021**

## Recommendation

That, on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer the following actions **BE TAKEN:**

a) this report **BE RECEIVED** for information;

b) the Civic Administration **BE DIRECTED** to take no further action on the Unsolicited Proposal dealing with mixed waste processing; and

c) the Civic Administration **BE DIRECTED** to develop details and a background business engagement document to initiate a two-step public procurement process (Request for Qualifications followed by a Request for Proposals) for a resource recovery facility or facilities (including mixed waste processing, mechanical-biological treatment and waste conversion technologies), pilot project or commercial scale, and report back to Civic Works Committee by December 2021 with details on how the process will occur; it being noted that Civic Administration already have direction to examine the potential for small scale, demonstration facilities for resource recovery facilities as part of the London Waste to Resources Innovation Centre, subject to Municipal Council approval.

## Executive Summary

The City of London has four major waste management projects underway:
1. Long-term Resource Recovery Strategy
2. 60% Waste Diversion Action Plan
3. Residual Waste Disposal Strategy
4. Transition to Extended Producer Responsibility Programs

This report focuses on updates as part of the development of the long-term Resource Recovery Strategy. A review of file information, reports and on-line sources suggest that there are a very limited number of mixed waste or partially mixed waste processing and advanced resource recovery facilities operating in Canada and the United States at this time. These kinds of facilities are much more common in Europe. In North America there have been a number of closures of first-generation facilities. However, in recent years there are a few that are establishing a longer track record in the business. The track record and experience in Europe is much longer and with better results.

Interest in advanced technologies in Ontario, other parts of Canada and parts of the United States remain high. Further research coupled with facility innovation at a few locations is providing the opportunity to build a stronger track record of success and a better appreciation of the risks, costs and benefits.

An Unsolicited Proposal for mixed waste processing was received by the City of London (Purchasing and Supply) on November 22, 2020. The unsolicited proposal was reviewed and staff are recommending no action be taken. Supporting this decision is information contained in this report including these summary details:

- The City has several public reports that highlight its interests in this area and ongoing research, information collection and review including progress in Ontario;
- In 2018, as part of a public Request for Information (RFI), the City received submissions from 26 vendors with technologies or access to technologies for mixed waste processing and advanced resource recovery;
- The City has set aside land beside the W12A Landfill Site for resource recovery facilities and related industries (Waste Management Resource Recovery Area and the potential development of Eco-Industrial Parks, as per The London Plan);
- The City established the concept of the London Waste to Resources Innovation Centre in 2015 and entered a five year program with Western University in 2019 to continue to examine opportunities to create more resources from materials traditionally sent to landfill;
- The City has not completed its long-term Resource Recovery Strategy including approved budgets;
- Provincial policy, technical direction and standards on mixed waste processing facilities and advanced resource recovery facilities is limited at this time;
- The Canada-European Union Comprehensive Economic and Trade Agreement (CETA), signed May 2017, has created numerous opportunities for both parties to enhance economic opportunities and trade; and
- The City is involved with a comprehensive Environmental Assessment for the expansion of the W12A Landfill. This is a priority project for the City.

City staff are recommending that details and a background business engagement document be prepared to initiate a two-step public procurement process (Request for Qualifications followed by a Request for Proposals) for a resource recovery facility, pilot project or commercial scale. A report to Civic Works Committee and Council to receive further direction is proposed for December 2021.

## Linkage to the Corporate Strategic Plan

Municipal Council continues to recognize the importance of solid waste management and the need for a more sustainable and resilient city in the development of its 2019-2023 Strategic Plan for the City of London. Specifically, London's efforts in solid waste management address the three following areas of focus: Building a Sustainable City; Growing our Economy; and Leading in Public Service.

On April 23, 2019, the following was approved by Municipal Council with respect to climate change:

> *Therefore, a climate emergency be declared by the City of London for the purposes of naming, framing, and deepening our commitment to protecting our economy, our ecosystems, and our community from climate change.*

The developing Resource Recovery Strategy, including the implementation of the 60% Waste Diversion Action Plan (and the Green Bin program), addresses various aspects of climate change mitigation within the waste management services area including greenhouse gas (GHG) reduction.

## Analysis

### 1.0 Background Information

#### 1.1 Previous Reports Related to this Matter

Some relevant reports that can be found at www.london.ca under Council and Committee meetings include:

- Case #10: Revised Implementation (Case #1, 2020 Budget) - 60% Waste Diversion Action Plan (January 12, 2021 meeting of Council)

- Updates – 60% Waste Diversion Action Plan Including the Green Bin Program (November 17, 2020 meeting of the Civic Works Committee (CWC), Item #2.2)
- Business Case 1 – 60% Waste Diversion Action Plan – 2020-2023 Multi -Year Budget (January 30, 2020 meeting of the Strategic Priorities & Policy Committee (SPPC), Item #4.12a)
- Current and Proposed Actions for Reducing and Managing Plastics I the Residential Sector and the Role for the Hefty® EnergyBag® Pilot Project (July 23, 2019 meeting of the CWC, Item #2.5)
- Update and Next Steps for the London Waste to Resources Innovation Centre (April 16, 2019 meeting of the CWC, Item #2.4)
- Memorandum of Understanding with Green Shields Energy as Part of the London Waste to Resources Innovation Centre (April 16, 2019 meeting of the CWC, Item #2.5)
- 60% Waste Diversion Action Plan – Updated Community Feedback (September 25, 2018 meeting of the CWC, Item #3.2)
- Public Participation Meeting 60% Waste Diversion Action Plan – Additional Information (September 25, 2018 meeting of the CWC, Item #3.2)
- 60% Waste Diversion Action Plan (July 17, 2018 meeting of the CWC, Item #3.1)

### 1.2 Context

The City of London has four major waste management projects underway:

1. Long-term Resource Recovery Strategy - involves the development of a plan to maximize waste reduction, reuse, recycling, resource recovery, energy recovery and/or waste conversion in an economically viable and environmentally responsible manner. Resource Recovery strategies (i.e., which includes waste diversion strategies) are developed and approved at the local government level. Technologies are subject to approvals and regulations from the Provincial government. Appendix A contains previously released information (60% Waste Diversion Action Plan report, 2018) that helps define mixed waste processing and related advanced resource recovery technologies. The 60% Waste Diversion Action Plan is a major step for the long-term Resource Recovery Strategy.

2. 60% Waste Diversion Action Plan - proposes a set of 21 actions to achieve 60% diversion of residential waste by the end of 2022. The budget for the multi-year implementation (2020-2023 Multi-Year Budget Business Case #1) was approved March 2, 2020. Shortly after this date, the COVID-19 state of emergency was declared provincially on March 17, 2020, and locally March 20, 2020. A revised implementation plan and budget was approved by Municipal Council on January 12, 2021 that includes the implementation of a Green Bin program.

3. Residual Waste Disposal Strategy - involves the development of a long-term plan to manage residual waste (generally waste after diversion and resource recovery initiatives) and involves completion of an Individual Environmental Assessment (EA) for the expansion of the W12A Landfill as prescribed by the Ministry of the Environment, Parks & Conservation (MECP). The Individual EA requires approval by the Minister of the Environment, Parks & Conservation and Cabinet.

4. Transition to Extended Producer Responsibility Programs - for several years, a number of materials that have been traditionally managed by municipalities have been transitioning to new management systems whereby industry has taken greater administrative and financial responsibility for the materials it creates (Table 1).

**Table 1: Status of Programs Transitioning to Extended Producer Responsibility**

| Material | Transition Status | Transition (Proposed) Date | How does the City get Involved? |
|---|---|---|---|
| Used Tires | Complete | January 1, 2019 | Accept at EnviroDepots on behalf of industry producers |

| Material | Transition Status | Transition (Proposed) Date | How does the City get Involved? |
|---|---|---|---|
| Batteries | Complete | July 1, 2020 | Accept at EnviroDepots on behalf of industry producers |
| Electronics | Complete | January 1, 2021 | Accept at EnviroDepots on behalf of industry producers |
| Municipal Hazard and Special Waste (HSW) | Draft Regulation | Proposed July 1, 2021 | Currently accepted at W12A HSW Building |
| Blue Box Materials | Draft Regulation | Proposed Jan. 1, 2023 to Dec. 31, 2025 | Part of the Core Team participating in regulation and process development |

This report deals primarily with the first of four projects and includes several updates and the next steps regarding mixed waste processing, advanced resource recovery and the long-term Resource Recovery Strategy.

## 2.0 Discussion and Considerations

This section (and Appendices B and C) contains details on mixed waste processing and related technologies in the following areas:

2.1 Overview of Recent History on Mixed Waste Processing and Related Technologies in Canada, United States and Europe (and Appendix B)
2.2 Current Experience in Ontario (and Appendix C)
2.3 Current Experience in London
2.4 Review of Unsolicited Proposal
2.5 Next Steps

### 2.1 Recent History on Mixed Waste Processing and Related Technologies in Canada, United States and Europe (and Appendix B)

[The following details are a work in progress and will be updated as new information is shared with or obtained by City staff.]

A review of file information, reports and on-line sources suggest that there are a very limited number of mixed waste or partially mixed waste processing facilities operating in Canada at this time. Available details (Appendix B) suggest that at least 10 facilities have either closed or were re-engineered away from mixed waste processing. Many of these facilities were older, first generation facilities.

The Halifax Regional Municipality has recently proposed to close (December 2020) the Front End Processor/Waste Stabilization Facility (FEP/WSF) that has been in operation since 1995. It remains in operation, but its future is uncertain. The City of Edmonton is operating a facility to create refuse derived fuel from mixed waste to send to the Enerkem gasification system. In Nova Scotia, Sustane Technologies (pyrolysis technology) has been processing mixed waste since 2019. These are likely the only three facilities managing a mixed waste stream in operation in Canada. This does not include technologies that combust waste, with and without energy recovery.

Experience in the United States is very similar (Appendix B). Most first-generation, mixed waste processing and composting facilities have closed or have been re-engineered to meet newer program needs (e.g., acceptable lower diversion and recovery rates, more stringent end product quality, etc.). A few, newer facilities have been established in the last five years and are developing a proven track record. However, a few newer facilities have also been closed or re-engineered as the original design was not meeting performance or contractual requirements.

Experience in Europe and a few other countries with large scale mixed waste processing and resource recovery facilities indicate that these facilities can meet local requirements. For example, a 2017 report identified 570 Mechanical Biological Treatment (MBT) facilities operating in Europe. The challenge for Canadian municipalities is understanding the local conditions in which European MBT facilities operate, contractual requirements, how risks are shared or assumed, operating and capital costs, etc. There is also emerging information that suggests that some countries in Europe may be moving away from mixed waste processing and MBT facilities in favour of source separation systems for recycling and organics. For example, MBT will no longer count towards EU recycling targets after 2026. Starting January 1, 2027, the Waste Framework Directive requires that only separately collected and processed organics will be counted as diversion and meet the requirements of the Directive.

Further work is underway to understand the European Directives with respect to source separation programs for organics and the role of mixed waste processing and MBT facilities. A recent blog posting by the Swedish Environmental Protection Agency (Appendix B) further confirms more analysis is required on the future direction of MBT facilities in Europe.

### 2.2 Current Experience and Direction in Ontario

The Ministry of the Environment and Climate Change (now the Ministry of Environment, Conservation and Parks - MECP) issued the Food and Organic Waste Policy Statement on April 30, 2018. The document establishes the following targets and timelines for organics management in Ontario:

- larger municipalities that currently do not have a Green Bin program need to implement an organics management program that will achieve at least a 70 per cent waste reduction and resource recovery of food and organic waste generated by single-family dwellings by 2025.

- multi-residential buildings need to implement an organics management program that will achieve at least a 50 per cent waste reduction and resource recovery of food and organic waste by 2025.

The document states the:

> "*collection of source separated food and organics waste is the preferred method of servicing single family dwellings*" but notes that "*alternatives to the collection of source separated food and organics waste may be used if it is demonstrated that provincial waste reduction and resource recovery targets can be achieved efficiently and effectively*".

The rules and regulations around mixed waste processing are evolving as current regulations do not explicitly address mixed waste processing or the use of products produced (e.g., compost, digestate, solid recovered fuel, etc.). There are no operating mixed waste processing facilities in Ontario. All facilities have closed or were re-engineered as noted in Appendix B.

Through the Regional Public Works Commissioners of Ontario (RPWCO) Waste Subcommittee, mixed waste processing and advanced resource recovery (e.g., waste conversion technologies) initiatives and actions are shared quarterly among the 20 member municipalities. The most active municipalities are Region of Durham, Region of Peel, City of Toronto and the City of London (section 2.3). Appendix C contains updates from Durham, Peel and Toronto. Research has also been undertaken in the Region of York and the Region of Niagara. The County of Oxford, not a member of RPWCO, was very active with advanced resource recovery facilities until 2019 when it stopped its procurement process.

## 2.3 Current Experience and Direction in London

In addition to ongoing work through RPWCO, the City of London currently has a number of activities underway with respect to mixed waste processing and advanced resource recovery initiatives:

- As part of the 60% Waste Diversion Action Plan, Municipal Council approved the direction to proceed with a pilot project for mixed waste processing for waste collected from a portion of London's multi-residential buildings. City staff are currently working on current opportunities and alternative plans for Council's consideration.

- Research at the London Waste to Resources Innovation Centre including the NSERC Industrial Research Chair Thermochemical Conversion of Biomass and Waste to Bioindustrial Resources administered by Western University (2019), has been under way since 2015. Academic research, laboratory and bench scale testing, and field work ranges from feedstock handling to material quality through to technologies and end market products (e.g., mechanical recycling, chemical recycling, material conversion, alternative low carbon fuel, solid recover fuel, etc.).

- As part of the the London Waste to Resources Innovation Centre, the City has a non-binding Memorandum of Understanding (MoU) with Green Shields Energy - GSE (until December 31, 2022). The MoU sets out the short-term objective of collaboration between the City and GSE to undertake testing and develop data/information on the viability of Hydrogen Reduction technology to manage various non-hazardous waste streams including household garbage. This research has the potential to move to constructing and operating a demonstration scale facility containing a Hydrogen Reduction unit designed for demonstrating the effectiveness of the process on the conversion of various non-hazardous wastes.

  A provisional patent was issued for the technology on February 2021 for Canada and USA. The Intellectual Property (IP) is fully protected. The final patent is pending. Discussions are ongoing with MECP on the required approvals process for the technology under a demonstration Environmental Compliance Approval. Financial and operating arrangements are being developed and will be subject of a future report to Committee and Council.

- London's Hefty® EnergyBag® Pilot Project (for hard-to-recycle plastic items that are currently placed in the garbage), launched in late 2019 and proceeded as planned until March 2020. A number of adjustments have been made to address operating through the pandemic including delaying measurement studies and postponing expansion until a clearer picture is available. Revisions will be launched in May 2021. This project includes working with a number end markets and advanced resource recovery technologies.

## 2.4 Review of Unsolicited Proposal for Mixed Waste Processing

The City of London welcomes unsolicited proposals from individuals and organizations that could benefit London. The City will consider proposals that:

- Satisfy a City of London need or problem
- Are innovative or unique opportunities to improve service delivery
- Demonstrate significant value or saving, or mitigate risks
- Have significant revenue generation or economic development potential

Unsolicited proposals are subject to the City of London's Procurement of Goods and Services Policy as per section 21.2.

21.2 Direct Solicitation

a. Unsolicited proposals received by the City shall be referred to the Manager of Purchasing and Supply for review.

b. Any procurement activity resulting from the receipt of an unsolicited proposal shall comply with the provisions of this Policy.
c. A contract resulting from an unsolicited proposal shall be awarded on a non-competitive basis only when the procurement complies with the requirements of a non-competitive procurement, as detailed in Section 14.

An unsolicited proposal for mixed waste processing was received by Purchasing and Supply on November 22, 2020. The City of London currently collects about 90,000 tonnes of residential waste including about 3,000 tonnes of bulky waste (e.g., mattresses, couches, etc.) from homes with curbside service.

**City Staff - Summary Comments:**

The unsolicited proposal contains preliminary information that demonstrates at a high level what mixed waste processing could achieve in London. The basic information is supported by proven experience at a smaller mixed waste processing facility in Europe. There is no similar facility operating in North America at this time.

It is not possible to conduct a thorough review of this unsolicited proposal as it essentially a starting point for a negotiation for a project and not a complete proposal that can be reviewed on its own merits.

In consultation with staff from Purchasing and Supply and Finance Services, it was determined that additional details on the unsolicited proposal should not be obtained as there are likely many competitive suppliers of this service that would have interest in an opportunity to build, operate and showcase their technology, if the opportunity was made available. Supporting this decision are the following:

- The City has public reports that highlight its interests in a future where mixed waste processing and/or advanced resource recovery facilities could be located near the W12A Landfill.

- In 2018, as part of a public Request for Information (RFI), the City received submissions from 26 vendors with technologies or access to technologies for mixed waste processing and advanced resource recovery. Of the 26 submission, 20 vendors included a form of mixed waste processing (i.e., different levels of processing) as the front end to the overall technology solution.

- The City has set aside land beside the W12A Landfill Site for resource recovery facilities and related industries (Waste Management Resource Recovery Area and the potential development of Eco-Industrial Parks, as per of The London Plan).

- The City established the London Waste to Resources Innovation Centre in 2015, and expanded in collaboration with Western University and many business partners (April 2019), and has been working with a number of different new, emerging and next generation technologies for turning waste materials into resources.

- The City has not completed its long-term Resource Recovery Strategy, has not prepared long-term operating and capital budget costs and potential savings (e.g., prepare a business case), greenhouse gas (GHG) reduction benefits, and has not received Council direction in this regard.

- Provincial policy and technical direction on mixed waste processing facilities and advanced resource recovery facilities is limited at this time. The Province has expressed strong support for further progress in these areas; however specific standards, guidelines and operating practices do not exist. These will be developed as experience is gained with technologies. At this point in time, the Provincial government has not expressed any new financial support for innovative projects of this nature.

- The Canada-European Union Comprehensive Economic and Trade Agreement (CETA), signed May 2017, has created numerous opportunities for both parties to enhance economic and trade. With respect to mixed waste processing and/or advanced resource recovery technologies, companies that traditionally may not pay attention to the Canadian marketplace, may now look at it as an entry point to North American opportunities and partnerships.

- As noted in Section 1.2, the City is involved with a comprehensive Environmental Assessment for the expansion of the W12A Landfill. This is a priority project for the City and is following a prescribed process for Individual Environmental Assessments. The Draft Environmental Assessment Study Report was submitted to CWC on March 30, 2021 and to Council on April 13, 2021. The timetable for the current priority activities, which has bearing on all future activities near the landfill, is found on Table 2.

**Table 2: W12A Landfill Draft Environmental Assessment Study Timetable**

| Date | Step |
|---|---|
| April 20 to May 19, 2021 | • Circulate Draft EASR to GRT and other stakeholders. Place Draft EASR on-line and at City Hall for review. |
| Late June/Early July, 2021 | • Review of EASR by Waste Management working Group (WMWG). |
| July 27, 2021 (tentative) | • CWC to hold public participation meeting for EASR.<br>• CWC to consider recommending submission to MECP. |
| August 10, 2021 | • Council approval of CWC recommendation. |
| August 19, 2021 | • Formal submission of Proposed EASR to MECP (includes notice to all stakeholders). |
| August 19, 2021 to Mid-March 2022 or later | • MECP provides a seven week review period for stakeholders to provide comments to the MECP.<br>• MECP evaluates EASR submission and makes recommendation to the Minister.<br>• Minister makes Decision to Approve or Reject. |

The above details have led to staff's determination that no further action be taken on the unsolicited proposal. Furthermore, the Procurement of Goods and Services Policy section 6.3 is very clear regarding Prohibitions:

> 6.3 Official Point of Purchasing Contact and Lobbying Prohibition
>
> a. The City is committed to the highest standards of integrity with respect to the purchase of goods and/or services and managing the processes by which goods and/or services are acquired. The official point of purchasing contact shall be a member of the Purchasing and Supply Team. Should it be necessary or desirable to have a contact person to respond to technical issues that person shall be named in the competitive bid documents. All communications will be made by these individuals and during the procurement process, no bidder or person acting on behalf of the bidder or group of bidders shall contact any elected official, consultant or any employee of the City to attempt to seek information or to influence the award of the contract. Any activity designed to influence the decision process, including, but not limited to, contacting any elected official, consultant or employee of the City for such purposes as meetings of introduction, social events, meals or meetings related to the selection process, shall result in disqualification of the bidder for the project to which the influential activity is deemed to be directed.
>
> - Notwithstanding the foregoing, this prohibition does not apply to meetings specifically scheduled by the City Purchasing and Supply group for

presentations or negotiations. Any bidder found to be in breach of this Policy shall be subject to immediate disqualification from the procurement process and may be prohibited from future opportunities at the discretion of City Council.

b. In addition, no bidder who has been awarded the contract shall engage in any contact or activities in an attempt to influence any elected official or any employee of the City with respect to the purchase of additional enhancements, options, or modules. However, a contractor may communicate with the appropriate member of the Purchasing and Supply Team, the Manager of Purchasing and Supply or the City Treasurer for purposes of administration of the contract during the term of the contract.

c. The determination of what constitutes influential activity is in the sole discretion of the Manager of Purchasing and Supply, acting reasonably, and not subject to appeal.

d. Contract award decisions shall be based on clear, transparent and objective criteria that is applied free from political considerations or political interference.

### 2.5 Next Steps

The following are the proposed next steps to engage the marketplace and complete the long-term Resource Recovery Strategy (Table 3).

**Table 3: Tentative Timetable for Marketplace Engagement and Completion of the Resource Recovery Strategy**

| Tentative Timeframe | Step |
|---|---|
| May to September 2021 | Hold discussions and reviews of procurement processes in Region of Durham and Peel for mixed waste processing and related technologies. Check in with other municipalities via RPWCO. |
| July to December 2021 | Finalize draft guiding principles, framework and processes for the long-term Resource Recovery Strategy including the role for the London Waste to Resources Innovation Centre and emerging economic development opportunities for the circular economy. Report to CWC and Council to receive direction. |
| July to December 2021 | Prepare details and a background business engagement document to initiate a two-step public procurement process (Request for Qualifications followed by a Request for Proposals) for a resource recovery facility or facilities (including mixed waste processing, mechanical-biological treatment and waste conversion technologies), pilot project or commercial scale.<br>This includes examining opportunities for funding from senior government, Federation of Canadian Municipalities (FCM) Green Fund and other technical support and investment agencies. Report to CWC and Council to receive further direction. |
| Q1 to Q3 2022 | Subject to Council approval, initiate a Request for Qualifications process followed by a Request for Proposals. |
| Q3/Q4 2022 | Complete final draft of long-term Resource Recovery Strategy and initiate a community engagement process. |
| Q3 2022 to Q2 2023 | Very tentative – bring the above activities to completion and Council approval. |

## 3.0 Financial Impact/Considerations

There are no financial impacts or considerations with this report. The report does refer to estimated capital and operating costs obtained from articles, reports, documents including technical documents completed for the Region of Durham, Region of Peel and City of Toronto.

Subject to Council direction, the next steps would include developing more details on preliminary cost estimates, landfill cost savings, economic development opportunities, GHG reduction benefits, and potential financing and funding opportunities for inclusion in the Resource Recovery Strategy. Upon completion and approval of the Strategy, any financial impacts would be brought forward for Council's consideration through a future budget process.

## Conclusion

Mixed waste processing and advanced resource recovery technologies have had a challenging past in Canada and United States. Successes in Europe highlight the potential of these alternatives to landfill. However, the changing situation in Europe also needs to be better understood in Canada.

Interest in Ontario among a number of municipalities continues to grow as municipalities look at their long-term waste management systems. The City of London is well positioned for future opportunities using continuous improvement thinking and a systematic approach that addresses financing, social responsibility, the environment and climate change.

Provincial and Federal government legislation, regulation and policies will continue shape waste elimination, reduction and reuse, waste diversion, resource recovery and final disposal. Senior levels of government have a very important role to play in the advancement of technologies.

| | |
|---|---|
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Appendix A Definitions of Mixed Waste Processing and Advanced Resource Recovery Technologies

Appendix B Additional Information - Recent History on Mixed Waste Processing and Related Technologies in Canada, United States and Europe

Appendix C Current Experience in Ontario

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# Appendix A
# Definitions of Mixed Waste Processing and Advanced Resource Recovery Technologies

The details below were first printed in 60% Waste Diversion Action Plan, July 2018. This section contains information in the following areas:

1. Background - Traditional Waste Diversion and Waste Management Technologies and Practices
2. Resource Recovery and Resource Recovery Systems
3. Integrated Solid Waste Management
4. Advanced Resource Recovery Technologies and Practices
   a) Anaerobic Digestion (AD - Biogas)
   b) Mixed Waste Processing (MWP)
   c) Mechanical/Biological Treatment (MBT)
   d) Waste Conversion Technologies (WCT)
   e) Energy from Waste (EFW)

## 1. Background - Traditional Waste Diversion and Waste Management Technologies and Practices

Generally, in Ontario, waste management systems include variations on the following practices to reach higher levels of waste diversion:

- Waste avoidance/prevention/minimization (not created in the first place)
- Reuse/refurbish/repurpose (for use again)
- Source separated recyclables (to be collected, processed, marketed and re-manufactured)
- Source separated leaf and yard waste (to be collected, processed and marketed)
- Source separated organics (food and other organics wastes) (to be collected, processed and marketed). Processing technologies generally include aerobic composting and anaerobic digestion (AD) technologies
- Energy from waste (EFW) through combustion
- Landfill

To go beyond 60% waste diversion will require the use of more advanced waste diversion and resource recovery technologies and practices.

The field of solid waste management has a plethora of definitions that fall into different categories including:

- Regulatory definitions usually defined by the Province of Ontario although some are defined at the Federal Government;

- By-law definitions usually defined by municipalities (and not always consistent from one municipality to the next); and

- Definitions created by waste management, recycling and other related organizations that have no legal foundation; however, they are often used by the members and adopted by others.

Some definitions often have a historical basis and have not been modernized; although the technologies within the definition are different than in the past. The inconsistency in legal definitions can be problematic when different provinces are compared. In addition, different technologies can be lumped together in some definitions with little understanding as to why that is the case. The section highlights a number of terms and some different definitions.

## 2. Resource Recovery and Resource Recovery Systems

*"Resource recovery means the extraction of useful materials or other resources from things that might otherwise be waste, including through reuse, recycling, reintegration, regeneration or other activities. This includes the collection, handling, and processing of food and organic waste for beneficial uses. Although energy from waste and alternative fuels are permitted as waste management options, these methods are not considered resource recovery. The recovery of nutrients, such as digestate from anaerobic digestion, is considered resource recovery.*

*Resource recovery system means any part of a waste management system that collects, handles, transports, stores or processes waste for resource recovery purposes, but does not include disposal."*

Source – Ministry of the Environment & Climate Change, Food and Organic Waste Policy Statement, April 2018, https://www.ontario.ca/page/food-and-organic-waste-framework

## 3. Integrated Solid Waste Management

*"Integrated Solid Waste Management (ISWM) is a comprehensive waste prevention, recycling, composting, and disposal program which works cohesively to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment. ISWM considers local needs and conditions, and then applies the most appropriate combination of waste management approaches for that situation. The major components of ISWM activities are waste prevention, recycling and composting, resource recovery, and, disposal in properly designed, constructed, and managed landfills."*

Sources - based on the EPA definition noting that determining a date of this definition is difficult because many current documents are now archived on the USEPA website. Environment Canada and the Ministry of the Environment & Climate Change do not have specific definitions; however, many municipalities in Ontario and across Canada have created definitions to meet their needs.

## 4. Advanced Resource Recovery Technologies and Practices

Generally, advanced resource recovery technologies and practices fall under one of these categories:

a) Anaerobic Digestion (AD - Biogas)
b) Mixed Waste Processing (MWP)
c) Mechanical/Biological Treatment (MBT)
d) Waste Conversion Technologies (WCT)
e) Energy from Waste (EFW)

The literature does not contain consistent definitions for these technologies and sometimes groups of technologies may be classified under a single heading.

a) Anaerobic Digestion (AD - Biogas)

AD facilities can be listed under both traditional (as noted above because it is a proven technology in Ontario) and advanced in the case of Ontario as most AD experience has been associated with farm operations. With respect to AD as part of Mechanical-Biological Treatment (MBT) or as part of a mixed waste processing (MWP) system, this would be considered advanced and belongs in this section.

*"Anaerobic digestion means the decomposition of organic matter by bacteria in an oxygen-limiting environment (as defined in Regulation 347 under the Environmental Protection Act). The biogas generated through anaerobic digestion can be used to fuel electrical generators, or it can be further processed into renewable natural gas. The digestate may also be used as a soil amendment that is most commonly used in agricultural operations."*

Source – Ministry of the Environment & Climate Change, Food and Organic Waste Policy Statement, April 2018, https://www.ontario.ca/page/food-and-organic-waste-framework

*"What is Biogas? Biogas is a renewable source of methane, the main ingredient in natural gas. It can be used for heating and cooling, or to generate electricity that can be used on-site or fed into the distribution grid. It can be refined into renewable natural gas that can be injected into gas pipelines or compressed and used as a vehicle fuel. The entire system, including the energy generating components, is typically referred to as a biogas facility or a biogas plant.*

*Biogas is produced when organic materials — anything from municipal organic wastes or bio-solids, food processing by-products, or agricultural manure and crop residues — break down in an oxygen-free environment. The process is called anaerobic digestion (AD) and usually occurs in a specialized tank or vessel – the anaerobic digester. AD is also the process that generates biogas or landfill gas (LFG) within landfills.*

*Anaerobic digesters have a number of end products, including digestate, a nutrient-rich slurry that can be applied directly on agricultural land, or material that is composted and then used for a range of purposes. Digester solids are materials from after de-watering that can be composted, and are well suited to be mixed with leaf and yard waste."*

Source - Canadian Biogas Association, Municipal Guide to Biogas, March 2015 https://www.biogasassociation.ca/

b) Mixed Waste Processing

*"Mixed-waste processing involves no generator separation of waste, with all waste processed at what's been called a "dirty" material recovery facility (MRF).[1] Recyclables are then pulled out at the MRF through a combination of manual and mechanical sorting. The sorted recyclable materials may undergo further processing required to meet technical specifications established by end-markets while the balance of the mixed waste stream is sent to a disposal facility such as a waste-to-energy facility or landfill".[2]*

* Source(s)
[1] Waste 360 http://www.waste360.com/mrfs/10-points-explain-mixed-waste-processing
[2] Wikipedia https://en.wikipedia.org/wiki/Materials_recovery_facility

*"Mixed waste processing means resource recovery processes that recover food waste or organic waste from waste streams where food and organic waste is co-mingled with other wastes."*

Source – Ministry of the Environment & Climate Change, Food and Organic Waste Policy Statement, April 2018, https://www.ontario.ca/page/food-and-organic-waste-framework

c) Mechanical/Biological Treatment (MBT)

*"Mechanical Biological Treatment (MBT) technologies are pre-treatment technologies which contribute to the diversion of MSW from landfill when operated as part of a wider integrated approach involving additional treatment stages. Mechanical Biological Treatment (MBT) is a generic term for an integration of several mechanical processes commonly found in other waste management facilities such as Materials Recovery Facilities (MRFs), composting or Anaerobic Digestion plant. MBT plants can incorporate a number of different processes in a variety of combinations. MBT therefore compliments, but does not replace, other waste management technologies such as recycling and composting as part of an integrated waste management system. MBT plants include the:*

- *Pre-treatment of waste going to landfill;*
- *Diversion of non-biodegradable and biodegradable MSW going to landfill through the mechanical sorting of MSW into materials for recycling and/or energy recovery as refuse derived fuel (RDF);*

- *Diversion of biodegradable MSW going to landfill by:*
- *Reducing the dry mass of MSW prior to landfill;*
- *Reducing the biodegradability of MSW prior to landfill;*
- *Stabilization into a compost-like output (CLO) for use on land;*
- *Conversion into a combustible biogas for energy recovery; and/or*
- *Drying materials to produce a high calorific organic rich fraction for use as RDF."*

Source - Mechanical Biological Treatment of Municipal Solid Waste, February 2013, Dept. of Environment, Food and Rural Affairs, www.defra.gov.uk

d) Waste Conversion Technologies (WCT)

Waste Conversion Technologies (WCT) include the broad range of technologies which are applied to recover the inherent stored resource value of targeted waste feedstocks and/or MSW and to make these resources available for use rather than for disposal.

*"There are a large number of technologies on the market at the moment and the use of many terms and definitions, with often different meaning. This reduces the possibility of comparing the different options. This chapter lists the most important concepts used in this field alphabetically.*

- *Gasification is the thermal breakdown of waste under oxygen starved conditions (oxygen content in the conversion gas stream is lower than needed for combustion), thus creating a syngas (e.g. the conversion of coal into city gas).*
- *Plasma gasification is the treatment of waste through a very high intensity electron arc, leading to temperatures of > 2,000°C. Within such a plasma, gasifying conditions break the waste down into a vitrified slag and syngas.*
- *Pyrolysis is the thermal breakdown of waste in the absence of air, to produce char, pyrolysis oil and syngas (e.g. the conversion of wood into charcoal)."*

Source - International Solid Waste Association (ISWA), Alternative Waste Conversion Technologies, 2013

*"New technologies to convert municipal and other waste streams into fuels and chemical commodities, termed conversion technologies, are rapidly developing. Conversion technologies are garnering increasing interest and demand due primarily to alternative energy initiatives. These technologies have the potential to serve multiple functions, such as diverting waste from landfills, reducing dependence on fossil fuels, and lowering the environmental footprint for waste management. Conversion technologies are particularly difficult to define because their market is in development and many of their design and operational features are not openly communicated by vendors. EPA's Office of Research and Development conducted research to evaluate and develop a "State of Practice" report for State and local decision-makers on the suite of emerging waste conversion technologies."*

Source - USEPA State of Practice for Emerging Waste Conversion Technologies, 2012 https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=305250

e) Energy-from-Waste (EFW)

*EFW is "A facility that generates steam and/or electricity through the combustion of municipal solid waste."*

Source – Canadian Resource Recovery Council, http://www.resourcerecovery.ca/info/glossary/

*"Energy-from-Waste is any technology, which recovers energy from the management/processing of waste materials. This includes Anaerobic Digestion, Mass Burn, Gasification, Plasma Gasification, and Landfill Gas Recovery.*

*Waste Derived Fuel is any technology designed to turn waste materials into a fuel product with the recovery of recyclables materials as part of the fuel development process."*

Source – Ontario Waste Management Association, Guiding Principles Integrated Solid Waste Resource Recovery and Utilization (OWMA EFW/WDF Committee, November 2011) https://www.owma.org/articles/guiding-principles-on-integrated-solid-waste-recovery-and-utilization

*Energy can be recovered from waste by various (very different) technologies. It is important that recyclable material is removed first, and that energy is recovered from what remains, i.e. from the residual waste. Energy from waste (EFW) technologies include:*

- *Combustion in which the residual waste burns at 850°C and the energy is recovered as electricity or heat*
- *Gasification and pyrolysis, where the fuel is heated with little or no oxygen to produce "syngas" which can be used to generate energy or as a feedstock for producing methane, chemicals, biofuels, or hydrogen (see also landfill gas and sewage gas)*
- *Anaerobic digestion, which uses microorganisms to convert organic waste into a methane-rich biogas that can be combusted to generate electricity and heat or converted to biomethane. This technology is most suitable for wet organic wastes or food waste. The other output is a biofertilizer.*

Source – Renewable Energy Association, United Kingdom https://www.r-e-a.net/renewable-technologies/energy-from-waste

*Energy recovery from waste is the conversion of non-recyclable waste materials into usable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolization, anaerobic digestion and landfill gas recovery. This process is often called waste to energy (WTE).*

Source - US EPA website, no date provided https://www.epa.gov/smm/energy-recovery-combustion-municipal-solid-waste-msw

# Appendix B
# Additional Information - Recent History of Mixed Waste Processing and Related Technologies in Canada, United States and Europe

**Canadian Experience**

There is limited experience with mixed waste processing and advanced resource recovery technologies for mixed waste in Canada. Past and current experience ranges from being positive and leading-edge to a number of facility closures, legal issues and facility re-engineering.

Newer information, knowledge and technical studies, more applicable to Ontario, is being produced and shared by companies such as Organic Waste Systems (OWS), 3Wayste North America, Anaergia Inc., Canada Fibers Ltd/GFL Environmental Inc. (CFL/GFL), Enerkem, Sustane Technologies Inc., Bradam Energies, Miller Waste Systems, and others. These are important contributions to furthering knowledge, understanding, complexities, benefits and risks associated with these technologies.

Status of many facilities (not including combustion facilities) in Canada is listed below on Table B-1. It is important to recognize that many facilities and technologies are designed for local and regional solutions, that circumstances and needs change, and facility closures often have multiple reasons behind decisions (e.g., financial, social, environmental, competing technologies, etc.). Any facility or technology that closes or is re-engineered has important learnings for municipal governments that contemplate investment and/or use of these new, emerging and next generation technologies.

**Table B-1: Status of Mixed Waste Processing and Advanced Resource Recovery Facilities in Canada**

| Facility Name | Location | Year Opened (approx.) | Year Closed/ Changes to Technology (approx.) |
|---|---|---|---|
| TCR Environmental | Aylmer, Ontario | 1991 | 1999 |
| Conporec Integrated Waste Management & Composting | Sorel-Tracy, Quebec | 1992 | Status unknown; likely closed |
| City of Guelph Wet/Dry Recycling & Processing | Guelph, Ontario | 1995 | 2001; re-engineered to meet new needs |
| Otter Lake Waste Facility | Halifax, Nova Scotia | 1996 | Operating; assessment to close is being reviewed |
| City of Moncton Wet/Dry Recycling & Processing | Moncton, New Brunswick | 1999 | 2016 |
| Super Blue Box Recycling Corp. (SUBBOR) | Guelph, Ontario | 2000 | 2002 |
| City of Edmonton Mixed Waste Processing and Composting | Edmonton, Ontario | 2000 | 2018 |
| City of Edmonton Integrated Processing and Transfer Facility | Edmonton, Ontario | 2000 | 2018; re-engineered to improve feedstock quality to Enerkem |
| Enerkem Biofuels and Chemicals | Edmonton, Ontario | 2014 | Operating |

| Facility Name | Location | Year Opened (approx.) | Year Closed/ Changes to Technology (approx.) |
|---|---|---|---|
| Dongara Pellet Plant | Vaughan, Ontario | 2008 | 2013; sold in 2016 |
| Plasco Energy Group | Ottawa, Ontario | 2008 | 2015 |
| CFL/GFL High Diversion Material Recovery Facility (former Dongara Pellet Plant) | Vaughan, Ontario | 2016 | Status unknown; likely being re-engineered |
| Sustane Technologies | Chester, Nova Scotia | 2019 | Operating |

**United States Experience**

[Note: Information contained in this section and the next section includes contributions from Dr. Paul van der Werf, Senior Consultant, AET Group, in addition to details from City of London staff.]

Starting in the 1980s, mixed waste processing and mixed waste composting have been a small part of organic waste diversion in the United States. Essentially, organic materials and in some cases recyclable materials are removed from mixed solid waste, using mechanical means. First generation plants used shredding during pre-preprocessing although this was often blamed for poor compost quality. Second-generation plants started moving towards using rotary drums and other technological innovations to better separate out organic waste and improve compost quality. [a]

As reported in 2005, there were 16 mixed waste composting plants in the U.S. They appeared to serve a specific niche "servicing rural areas and/or tourist destinations where the existing landfills have limited capacity and siting a new landfill isn't environmentally or economically feasible." [a] At that time there were about nine source separated composting programs and facilities and facilities servicing them. [b]

By 2007, this had declined to 13 mixed waste composting plants, as some of these plants started receiving source separated organics for composting, while there were 42 source separated composting programs and facilities and facilities servicing them. [c d]

By 2011 this had declined to 11 mixed waste composting plants, with one of them transitioning to the product of refuse derived fuel (RDF) (i.e., fuel for combustion and energy recovery). For each of the municipalities that used this approach it helped solve a unique challenge(s) and processing a single stream made the most sense economically and logistically. [e]

Table B-2 depicts the 11 mixed waste composting facilities that were open in 2011 and current status, where available. A little more than one-half continue to operate in one way or another.

The number of mixed waste composting facilities has remained steady and as of 2017 there continued to be 11[f] but by 2019 there were only six. [g] By early 2012 there were 150 source separated organics programs and facilities servicing them [h] and this has increased to 185 full-scale food waste composting facilities by 2019.[i]

The initial interest in mixed waste composting in the 1980s and 1990s has, over time, contracted, while source separated composting has grown exponentially. By 2019, 18% of the 4,713 US compost facilities accepted source separated organics and other organic feedstocks (approximately 850) while mixed waste composting accounted for 0.2% (6-10).[g]

**Table B-2: Mixed Waste Composting Facilities Open in 2011 and Current Status**

| Facility Name | Location | Estimated Capacity (tonnes/year) (as reported in 2011) | Current Status Year Closed/ Changes to Operations (approximate) |
|---|---|---|---|
| Z-Best Compost Facility | New Gilroy, California | 100,000 | Open |
| Mariposa County Landfill, Compost Facility and Recycling Center | Mariposa County, California | - | Unknown |
| Marlborough Composting Facility | Marlborough, Massachusetts | 40,000 | Appears to be Closed |
| Nantucket Landfill, MRF and MSW Composting Facility | Nantucket, Massachusetts | - | Open |
| Prairieland Compost Facility | Truman, Minnesota | - | Appears to be Closed |
| West Yellowstone Composting facility | West Yellowstone, Montana | - | Closed 2015 and replaced with source separated facility |
| Delaware County Composting Facility | Delaware County, New York | 23,000 | Open |
| Medina County Solid Waste District Waste Management Facility | Medina, Ohio | 140,000 | Closed. New smaller mixed waste composting facility opened in 2020 |
| Rapid City solid waste composting facility | Rapid City, South Dakota | 45,000 | Open (as of 2018) |
| Sevier County's MSW composting facility | Sevierville, Tennessee | 69,000 | Open |
| Columbia County Recycling and Waste Processing Facility | Columbia County, Washington | 14,000 | Unknown |

The key reason for the growth of source separated organics program and lack of growth and contracting of mixed waste composting generally relates directly to final compost quality. Using source separation to keep contaminants out of the composting or anaerobic digestion streams results in cleaner end products. Even though mixed waste composting and processing technologies have vastly improved over time, their end products (particularly compost) continue to be of lower quality compared to facilities processing source separated organics. It would be difficult for these products to meet Ontario's strict contamination requirements.

Finally, some US mixed waste processing facilities are producing solid recovered fuel for use in the cement industry, other large consumers of coal, for the direct replacement of other fossil fuel sources and the production of renewable natural gas (RNG). Three facilities are identified below noting that one facility is currently closed and one re-opened in 2018 after being closed:

- The first fully operational mixed waste HEBioT™ facility, operated by Entsorga West Virginia, is located in Martinsburg, West Virginia (about 150 kilometres west of Baltimore, Maryland). It opened in 2019 at a cost of about $45 million ($33 million US). It is designed to process 100,000 tonnes of mixed waste and produce

approximately 40,000 tonnes of high-calorific value SRF for the cement industry. Organics are left in the waste stream that is used as feedstock to create SRF where they are essentially stabilized (pre-treatment) through aeration channels, moisture is removed and the stabilized stream is processed with other materials to create SRF. Other materials include recyclables extracted from the mixed waste.

- Coastal Resources of Maine (CRM) opened a $120 million ($90 million US) MBT facility in Hampden, Maine using Fiberight's proprietary suite of technologies. The facility opened n in 2019 and is designed to handle 135,000 tonnes per year. The facility closed in May 2020 for a variety of technical, financial and end-market challenges. The goal was to recover recyclables, create a number of value-added resources (e.g., pulp moulded products), electricity, renewable natural gas and bio-fuels. CRM is in negotiation with a potential new facility operator, Delta Thermo Energy, and hopes to reopen in 2021.

- Phase one of a $50 million ($37 million US) mixed waste processing facility called Infinitus Renewable Energy Park (IREP), was opened in the City of Montgomery, Alabama in May 2014. The ultimate design was for 200,000 tonnes per year and future phase would include investment for SRF. Due to end market and financial challenges, it closed in October 2015. The City purchased the assets and re-opened the facility in late 2018 with a new operator, RePower South. An additional $16 million $12 million (US) was invested in the facility. The facility is currently open.

**European Experience**

The European Union (EU) Landfill Directive [j] compelled member states to reduce the amount of biodegradable wastes going to landfill to no more than 35%, by 2016-2020 (there is some variation between countries), than what was disposed in 1995.

To assist in this process most EU member states have imposed some sort of landfill tax ($3 to $120 US, in 2019[k]) to incent alternatives to landfill disposal.

An important solution used to achieve the above noted target has been mechanical biological treatment (MBT), where inbound municipal solid waste (MSW) is collected and received at a facility, where it is pre-processed, using various mechanical and in some cases optical sorting equipment to separate out biodegradable waste, recyclables, a fuel product and remaining waste. The biodegradable waste is subject to further biological treatment (e.g., composting or anaerobic digestion). The remaining waste may be landfilled although there has been a clear focus on preparing this waste as refuse derived fuel (RDF, a cleaning product for direct combustion or further processing) or as solid waste recovered fuel (SRF, and engineered fuel product).

As of 2017, Europe has about 570 active MBT facilities, with an annual capacity of approximately 50 million tonnes.[k] The number of facilities continue to increase in Europe. From 2012 to 2017 about 25 new MBT facilities were constructed and about 2 million tonnes/year of new capacity came online.[k] Further, it was estimated that from 2017-2025 another 120 facilities will be constructed and commissioned, and provide an additional 10 million tonnes of capacity. [l m]

There are concerns about the compost or compost-like products produced from MBT, primarily that it remains too contaminated with heavy metals and non-biodegradable contaminants such as plastic, metal and glass. [n] There has been a push for source separation of organic waste to facilitate the production of compost, which can be gainfully used as a soil amendment.

At the same time, additional work on pre-sorting organics from the incoming stream continues and technology suppliers are highlighting advancements with proprietary technology components.

A recent blog posting by the Swedish Environmental Protection Agency (Figure 1) further confirms more analysis is required on the future direction of MBT facilities in Europe.

**Figure 1: Swedish Environmental Protection Agency Mechanical Biological Treatment Plant Experience Blog Posting**

NATUR VÅRDS VERKET SWEDISH ENVIRONMENTAL PROTECTION AGENCY

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# Swedish Experience of Mechanical Biological Treatment Plants (MBT plants)

In the 80's Sweden made investments in MBT plants that were eventually shut down in favor of waste separation at source.

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In the 1970s, almost 60 percent of the household waste in Sweden was deposited on landfills, which is a big contrast compared to the current situation where only about 0.7 percent of the household waste goes to landfills. In this journey of shifting waste flows from landfills to material, energy and biological recycling, Sweden has tested various technologies and systems in order to fulfil the waste management hierarchy. One of the first steps taken in Sweden to increase material and biological recycling was to establish mechanical and biological treatment (MBT) plants in the early 1980s. However, it was soon realized that such plants did not create enough added value during the treatment of waste and therefore all the MBT plants in Sweden were eventually shut down.

Environmental objective

› A Good Built Environment

WASTE

‹ All pages within the area

Extended Producers Responsibility

Swedish waste management

Municipal waste management

Swedish Experience of Mechanical Biological Treatment Plants

## What is s Mechanical Biological Treatment plant?

An MBT plant, also known as a material recovery facility (MRF), utilizes mechanical sorting in order to separate and recover the different materials present in mixed waste such as metals and combustible materials, and includes further processing of biological material to produce compost for use in the agricultural sector. The major output fractions are recovered metals, refuse derived fuel (RDF) made up of the combustible material in waste, and compost.

The estimated investment cost of an MBT plant was around SEK 100 million in the 1980s. During that period, the Swedish Environmental Protection Agency (EPA) provided grants of between 25-50 percent in order to cover the initial investment of the plant.

## From mechanical sorting to source separation

The reasons for the closure of MBT plants in Sweden could be classified into two categories: operational issues and poor product quality. Realizing the problems with MBT plants, the Swedish municipalities started to shift focus to source separation of waste in the 1990s. Over time municipalities gradually invested in source separation of household waste. During the same time Extended Producer Responsibility was introduced for several product groups where source separation and household participation became key components to the EPR infrastructure.

*Last updated: 18 September 2020 Content editor: Nina Avdagic Lam*

As reported by the European Composting Network, the EU Fertilising Product Regulation COMM (2016) 157, came into force in July 2019. It defines input materials as source separated biowaste but no MBT or biosolids material are allowed.[o p]

European MBT facilities appear to work well at reducing the amount of waste sent to landfill for disposal. In particular, they appear to be able to produce SRF and RDF which can be directed to combustion. For the most part, they currently do not appear able to produce a compost product that can be gainfully applied as a soil amendment. There are some that do meet compost and land application requirements and research and application continues.

With superior pre-processing of MSW, the compost and compost-like produced from MBT may be able to meet Ontario's maximum allowable metal concentration for A or possibly AA compost, the ability to meet the very stringent foreign matter requirements will be much more challenging. This area require much more research in Ontario, Canada and the United States to demonstrate standards can be met and/or create approved applications where compost of a lesser quality can be used.

**Sources:**


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[b] Source Separated Composting Facilities in the US, Biocycle, December 2005 https://www.biocycle.net/source-separated-msw-composting-in-the-u-s/

[c] Mixed Waste Composting in Transition, Biocycle, November 2007 https://www.biocycle.net/mixed-msw-composting-in-transition/

[d] Source Separated Residential Composting in the US, Biocycle, December 2007 https://www.biocycle.net/source-separated-residential-composting-in-the-u-s/

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[f] The State of Organics Recycling in the US, Biocycle, October 2017 https://www.biocycle.net/state-organics-recycling-u-s/

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[h] Residential Food Waste Collection in the US, Biocycle, January 2012 https://www.biocycle.net/residential-food-waste-collection-in-the-u-s/

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[l] Drastic changes on market for MBT plants, FuturEnviro, no date https://futurenviro.es/en/drastic-changes-on-market-for-mechanical-biological-waste-treatment/

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[o] European Bio-Waste Management and the new EU Fertilising Product Regulation, European Compost Network, June 4, 2019 https://www.compostnetwork.info/wordpress/wp-content/uploads/190604_ECN_European-Biowaste-Management-and-the-new-EU-Fertilising-Product-Regulation.pdf

[p] European Fertilising Product Regulation is published, European Compost Network, June 27, 2019 https://www.compostnetwork.info/european-fertilising-product-regulation-is-published/

# Appendix C
# Current Experience in Ontario

Through the Regional Public Works Commissioners of Ontario (RPWCO) Waste Subcommittee, mixed waste processing and advanced resource recovery initiatives are shared quarterly among the 20 member municipalities. The most active municipalities are Region of Durham, Region of Peel, City of Toronto and the City of London (details provided in section 2.3). Several other member municipalities are tracking and reporting details as requested (e.g., Region of Niagara, Region of York) and a number have direct experience with these technologies operating in their municipality (e.g., City of Ottawa) or consideration of these technologies (e.g., City of Hamilton, Region of Waterloo). Further details are provided below for Durham, Peel and Toronto are below:

| Municipality | Status |
|---|---|
| Region of Durham | • In June 2019, Council approved to proceed with construction of a mixed-waste transfer and pre-sort facility and an anaerobic digester (AD. The facility would process the remaining waste. The Blue Box Program and Green Bin Program would continue to operate.<br>• The pre-sort facility would accept all residential residual garbage (about 160,000 tonnes per year) and separate out any organic and recyclables.<br>• The recyclables would be sent to market, while the organics would be processed at the AD facility, along with Green Bin organics, and converted into energy and fertilizer (facility sized for about 110,000 tonnes per year).<br>• The AD facility is anticipated to divert approximately 30,000 tonnes of organics annually from the pre-sort facility and an additional 30,000 tonnes would come from the source separated organics program making the initial volume being processed at treated approximately 60,000 tonnes per year.<br>• The remaining residue garbage would be sent to the Durham York Energy Centre (DYEC, an energy-from-waste facility).<br>• The upfront capital costs to build both facilities were estimated (2019) to be approximately $164 million, including land ($42.3 million for the Pre-sort facility; $116.3 million for the AD facility; $4.8 million for land).<br>• The estimated operating and maintenance costs for both facilities during the first year of operations would be $19.3 million.<br>• Costs could increase by an additional $15 million to $26 million per year for debenture financing costs to finance the initial capital investment. The estimated debt financing costs would be $20.5 million.<br>• Durham Region issued a Request for Pre-Qualifications for a Mixed Waste Presort and Wet Anaerobic Digestion Organics Processing Facility on August 20, 2020 and closed on December 1, 2020 (RFP 1062-2020):<br>  • 50 downloads of the document (plan takers) including at least 20 technology providers<br>  • 4 responses submitted:<br>  • Alberici Constructors, Ltd.<br>  • Maple Reinders Constructors Ltd.<br>  • Peel West Organics Solutions<br>  • Sacyr Environment USA LLC<br>• No further details available at this time. |

| Municipality | Status |
|---|---|
| Region of Peel | • In 2018, the Region of Peel completed a Mixed Waste Processing Feasibility Study that estimated the cost of a 250,000 tonnes per year facility at $250 million (excluding land). The estimated operating cost was $190 per tonne excluding the revenues from the sale of recyclables, renewable natural gas or low-carbon fuel.<br>• Region of Peel Council directed staff as follows on June 18, 2020:<br>Resolution Number 2020-474<br>*That staff be directed to report back to a future Waste Management Strategic Advisory Committee meeting with further information related to a mixed waste pilot for multi-residential garbage, including information on how a pilot fits into the Region of Peel's long-term waste management strategy, including timing, scope, costs, risks, outcomes, and options for procurement.*<br>• Peel Region issued a Request for Information and Expression of Interest for a Pilot Project for a Mixed Waste Processing Facility on December 24, 2020 and closed on February 8, 2021.<br>• 40 downloads of the document (plan takers) including at least 15 technology providers<br>• 11 responses submitted:<br>• 2124946 Ontario Ltd.<br>• 3Wayste North America<br>• AET Group Inc.<br>• Anaergia Inc.<br>• Bio-En Power Inc.<br>• Bradam Canada Inc<br>• CCI Bioenergy Inc.<br>• EPCOR Utilities Inc.<br>• GFL Environmental Inc.<br>• Miller Waste Systems Inc.<br>• Sacyr Canada Inc.<br>• No further details available at this time. |
| City of Toronto | Over the years, the City of Toronto has looked at a wide variety of mixed waste processing and advanced resource recovery technologies. In February 2020, Toronto staff provided an update report to Committee and Council that indicated that the $310 million initially anticipated as the cost for a mixed waste facility in the City's Long Term Waste Management Strategy is sufficient for a facility with a capacity of 270,000 tonnes per year. This assessment was derived from a rough order-of-magnitude costing exercise for a facility that includes a front-end sorting component for separation and capture of recycling and organic fractions, followed by organics contaminant removal and an anaerobic digester to process the organic fraction.<br>The operating cost was estimated at $16.9 million per year or about $63 per tonne. This does not include revenues from the sale of materials or renewable natural gas (RNG). These costing estimates were derived using industry-standard costs. Further analysis will be necessary to determine specific technology costs and to refine the estimate for effective planning.<br>City Council on September 30, October 1 and 2, 2020, adopted the following:<br>*1. City Council direct the General Manager, Solid Waste Management Services to consider future work on the development of a mixed waste processing facility, with or without a thermal treatment process, where* |

| Municipality | Status |
| --- | --- |
| | *the overarching goals are maximizing resource recovery through reduce, reuse, recycle, energy recovery then residual disposal, minimizing the dependence on long term landfill use all while ensuring the financial sustainability of the Solid Waste Management Services program.*<br>*2. City Council direct the General Manager, Solid Waste Management Services to report back to the Infrastructure and Environment Committee no later than the end of 2023 with a business case, including a triple bottom line analysis (environment, social and financial) and a utility rate impact assessment on the mixed waste processing of waste with and without thermal processing compared to increased reduction and diversion and traditional landfilling.*<br>*3. City Council direct the General Manager, Solid Waste Management Services to pursue potentially applicable Federal Government, Provincial Government, and non-profit organization funding opportunities to assist in implementing Parts 1 and 2 above and to negotiate and enter into all necessary agreements to receive any available funding in a form satisfactory to the City Solicitor.* |

# Mixed Waste Pre-Sort

July 8, 2020 Works Committee Meeting

DURHAM REGION

Service Excellence for our Communities

# Presentation Outline

Opening Remarks

What is Mixed Waste, Presort

Presort Objectives

Presort Technology

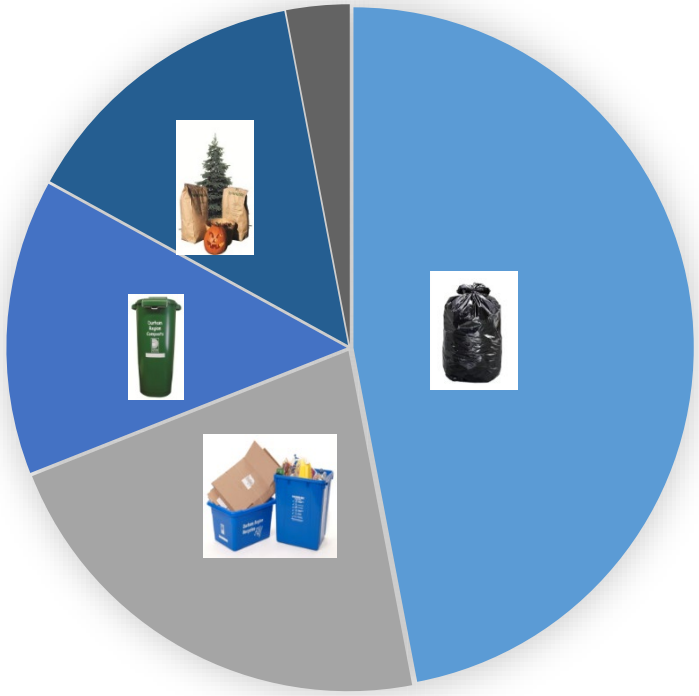
Artificial Intelligence in Presort

Presort Facilities

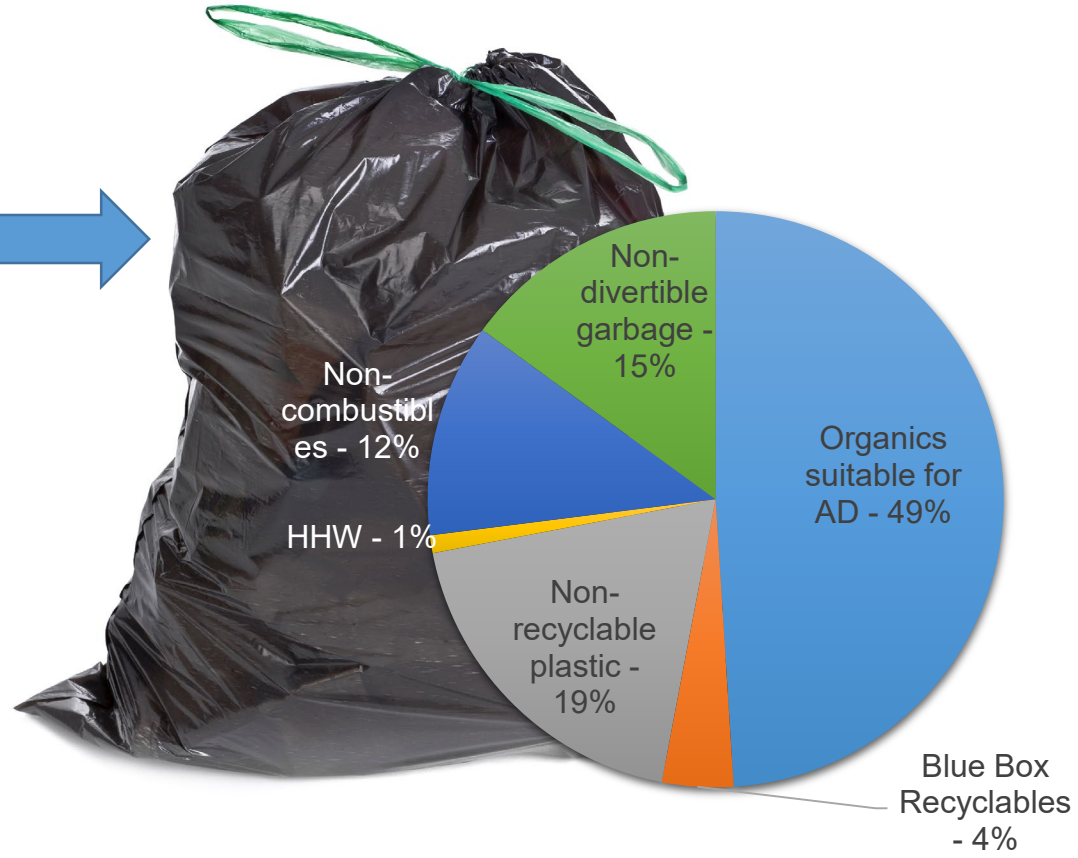
# What is Mixed Waste, Presort and Anaerobic Digestion?

# Durham's Residential Waste

## Tonnes of Residential Waste Managed



- Garbage - 47%
- Recycling - 22%
- Food Composting - 14%
- Leaf & Yard Waste Composting - 14%
- Other Diversion Programs - 3%



# Presort Objectives

- Remove Organics:
  - Quantity: 80 percent
  - Quality: Methane Potential and Digestate
- Remove Non-Combustables
  - Metals: Ferrous and Non-Ferrous
  - Glass
  - Rubble: bricks, stones….
- Recyclables with a positive marketing potential
- Others

# Presort Technology

- Bag Opener
- Manual Sorting
  - Large items: cardboard..
- Mechanical Sorting
  - Size
  - Shape
  - Density
  - Colour
- Artificial Intelligence

# Presort Layout

https://www.bulkhandlingsystems.com/solutions/municipal-solid-waste-msw/

# Artificial Intelligence in Presort

https://www.youtube.com/watch?v=tuIyOAq1PGk

# Presort Facilities

- GHD Technical Advisor
- Technology Review completed
- Existing facilities visited
- Performance audit
- Informed the Business Case and RFQ documents
  - Capture rates for quantity
  - Methane potential for RNG
  - Digestate and beneficial uses

# Questions

**The Regional Municipality of Durham**

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Sent via mail and email (gasserlinda@gmail.com)

November 24, 2020

Linda Gasser
111 Ferguson Street
Whitby, Ontario L1N 2X7

Dear Ms. Gasser:

**RE: Regional Municipality of Durham Mixed Waste Pre-Sort Anaerobic Digestion Facility and Long-Term Waste Management Plan**

Thank you for your comments submitted to the Municipality of Clarington (Clarington) Council as well as the Regional Municipality of Durham (Region) Works Committee received November 9, 2020. Region staff offer the following responses with regards to your questions.

**Mixed Waste Pre-sort Anaerobic Digestion Facility**

The previous Regional composition study and pilot assessment was completed with a specific technology set associated with an existing facility. From the results of the study, it was determined that the testing facility did not offer an appropriate solution for the Region. The proposed Mixed Waste Pre-sort Anaerobic Digestion (MWP/AD) facility has more specific objectives that will allow the Region to meet targets in the provincial Food and Organic Waste Policy Statement and integrates into the existing waste management systems in the Region. Mixed Waste Pre-sort (MWP) is one available technology to increase the capture of organics that is also being investigated by other municipalities.

The proposed MWP will allow the Region to meet several objectives in relation to the facility. These include the primary objective of separation of residual organics from the mixed waste stream diverting them to organics processing and resulting in the generation of renewable energy in the form of natural gas. Secondly, the process will allow the recovery of non-combustible materials including metals and rubble, by removing these materials prior to the Durham York Energy Centre (DYEC). The Region will avoid incurring the costs associated with processing this material through the DYEC, where its inert nature would not result in energy production or a reduction in disposal volume. Additionally, the MWP will have the ability to

sort wastes, recovering marketable materials where market demand exists and in response to shifting conditions in the material streams and marketplace.

MWP/AD will allow the Region to expand the acceptable items in the current Green Bin program to include pet waste, diapers and sanitary products. This increases the level of service to Regional residents by reducing the average storage time for several odourous materials by including them into a weekly, rather than a bi-weekly collection program. Also, due to the technology being employed there will no longer be a requirement for compostable bags. This will increase program participation rates as well as the capture of organics. This is anticipated to increase the Region's diversion rate to over 70 per cent.

The generation of organics recovered from the waste stream has been raised as a concern. However, it should be noted that many other jurisdictions operate Anaerobic Digestion (AD) facilities from programs with much higher contamination rates of the feed material than the Region's system. To ensure materials from both organic sources can be used at their highest reuse potential, for the initial commissioning, the Region intends to specify that the MWP/AD will process digestates derived from the source separated organics (Green Bin) separate from the facility separated organics derived from the MWP. These two sources of organics for AD will remain separate until such time that it can be demonstrated that satisfactory performance of both processing lines are in keeping with relevant guidelines.

Combustible residues remaining after processing at the MWP/AD facility will continue to be within the scope of the current contract for the DYEC. No new materials are proposed to be processed due to the development of the MWP/AD facility, as the MWP is intended to divert additional materials from the residential waste stream prior to it being delivered for energy recovery in keeping with the waste hierarchy. All Environmental Compliance Approval (ECA) emission limits will continue to apply. By removing recyclable materials and high moisture content organics, it is anticipated that following MWP the DYEC will operate more efficiently, increasing the amount of energy recovered per tonne of materials. By sorting organics, non-combustibles and recyclable materials during the MWP, there will be a smaller amount of processed material sent to the DYEC, thereby delaying a future expansion.

**Long-Term Waste Management Plan**

At the Energy from Waste-Waste Management Advisory Committee (EFW-WMAC) meeting of September 24, members requested that the Long-Term Waste Management Plan (LTWMP) Guiding Principles (GP) be referred to Works staff for comment and for staff to answer the question of where the evidence is that shows Regional Council

approved the GP and report back to the Committee, and further, once the response is confirmed, that a special EFW-WMAC meeting be called for the purpose of providing comments for the LTWMP.

Please find attached a summary outlining the approval of the LTWMP's GP by Regional Council, as confirmed by Legislative Services and in addition to the response from Nancy Taylor, Commissioner, Finance, included as correspondence in the EFW-WMAC Addendum of September 24, which confirmed the following:

> "...2020 Works Department Business Plans and Budgets which was subsequently presented to the Works Committee on February 5, 2020, and recommended that the Finance and Administration Committee for subsequent recommendation to Regional Council approve the 2020 Property Tax Supported Business Plans and Budgets for the Works Department's General Tax and Solid Waste Management operations. This report has additional detail that may assist you in determining prioritizations and action items, including Solid Waste Management. It can be found at the following link: https://calendar.durham.ca/meetings/Detail/2020-02-05-0930-Works-Committee-Meeting. Within the February 11, 2020 F&A minutes (page 15) and subsequently at the February 26, 2020 meeting of Regional Council (minutes page 19), the 2020 Business Plan and Budget for Solid Waste Management at a net property tax requirement of $47,736,000 was recommended and approved, as is detailed in the 2020 Solid Waste Management Business Plan and Budget available to you (page 272) at the following link: https://www.durham.ca/en/resources/2020-Detailed-Durham-Region-Approved-Business-Plans-and-Property-Tax-Supported-Budgets.pdf...".

Sincerely,

Gioseph Anello, M.Eng., P.Eng., PMP
Director, Waste Management Services

c. J. Gallagher, Municipal Clerk, Municipality of Clarington

Enclosure

# Summary of Durham Region Council Approval of Waste Management Services' Long-Term Waste Management Plan's Guiding Principles

**Committee of the Whole Meeting of January 15, 2020**

**Solid Waste Management: 2020 Strategic Issues and Financial Forecast (Report #2020-COW-2)**

4.2 The 2021 to 2040 Long-Term Waste Management Plan will be guided by the following principles, as identified and consistent with the 2019 Solid Waste Management Servicing and Financing Study (2019-COW-03):

a) Working with rapid and diverse population growth to ensure community vitality and innovate how the Region delivers cost effective waste management services to its communities.

b) Working in collaboration with producers and importers of designated products and packaging under "Extended Producer Responsibility" regulations and strategies to transition the full costs for managing these materials from municipalities to producers and importers.

c) Applying innovative approaches to repurposing the Region's waste streams and managing them as resources in a circular economy and developing local opportunities that contribute toward ensuring the Region's economic prosperity.

d) Demonstrating leadership in sustainability to address the climate crisis by adopting new or adjusting existing waste management programs and technologies and green energy solutions to reduce greenhouse gas emissions.

**Committee of the Whole Meeting of January 15, 2020**

Moved by Councillor Lee, Seconded by Councillor Barton,

(3) That we recommend to Council:

That the 2020 Solid Waste Management Strategic Issues and Financial Forecast be received and forwarded to the 2020 Business Planning and Budget deliberations.

[CARRIED]

**Regional Council Meeting of January 29, 2020**

10.3 Report of the Committee of the Whole

2. Solid Waste Management: 2020 Strategic Issues and Financial Forecast (Report #2020-COW-2)

[CARRIED]

That the 2020 Solid Waste Management Strategic Issues and Financial Forecast be received and forwarded to the 2020 Business Planning and Budget deliberations.

Moved by Councillor Chapman, Seconded by Councillor Collier,

(26) That the recommendations contained in Items 1 and 2 inclusive of the First Report of the Committee of the Whole be adopted.

[CARRIED]

**Regional Council Meeting of February 26, 2020 approved the 2020 Business Planning and Budget**

**THE REGIONAL MUNICIPALITY OF PEEL**

**WASTE MANAGEMENT STRATEGIC ADVISORY COMMITTEE**

**AGENDA** **WMSAC - 4/2017**

**DATE:** **Thursday, November 30, 2017**

**TIME:** **11:00 AM – 1:00 PM**

**LOCATION:** **Regional Council Chamber, 5th Floor**
**Regional Administrative Headquarters**
**10 Peel Centre Drive, Suite A**
**Brampton, Ontario**

**MEMBERS:** **F. Dale; A. Groves; J. Innis; J. Kovac; M. Mahoney; M. Palleschi; C. Parrish; K. Ras; R. Starr**

*Chaired by Councillor M. Palleschi or Vice-Chair Councillor J. Innis*

## 1. DECLARATIONS OF CONFLICT OF INTEREST

## 2. APPROVAL OF AGENDA

## 3. DELEGATIONS

## 4. REPORTS

4.1. Roadmap to a Circular Economy in the Region of Peel **(A copy of the "Roadmap to a Circular Economy in the Region of Peel 2018-2041 Report" is available from the Office of the Regional Clerk for viewing)**
Presentation by Norman Lee, Director, Waste Management

4.2. Update on the Transition of the Blue Box Program and Used Tires Program to Full Producer Responsibility (For information)

4.3. Update on the Province Food and Organic Waste Framework (For information)

4.4. Strategic Terms for the Anaerobic Digestion Facility Project

## 5. COMMUNICATIONS

## 6. IN CAMERA MATTERS

## 7. OTHER BUSINESS

## 8. NEXT MEETING

Thursday, February 1, 2018, 1:00 p.m. – 3:00 p.m.
Regional Administrative Headquarters
Council Chamber, 5th Floor
10 Peel Centre Drive, Suite A
Brampton, Ontario

## 9. ADJOURNMENT

Region of Peel
working with you

**REPORT**
**Meeting Date: 2017-11-30**
**Waste Management Strategic Advisory Committee**

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DATE: November 21, 2017

REPORT TITLE: **ROADMAP TO A CIRCULAR ECONOMY IN THE REGION OF PEEL**

FROM: Janette Smith, Commissioner of Public Works

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**RECOMMENDATION**

**That the Region of Peel's Long Term Waste Management Strategy as described in the report of the Commissioner of Public Works titled, "Roadmap to a Circular Economy in the Region of Peel" be adopted.**

**REPORT HIGHLIGHTS**

- On October 8, 2015, Regional Council adopted a 3Rs waste diversion target of 75 percent by 2034. To meet this target, staff has developed a new long term strategy titled "Roadmap to a Circular Economy in the Region of Peel" (the "Roadmap"). A full copy of the Roadmap is available from the Office of the Regional Clerk for viewing.
- The Roadmap identifies three key objectives for waste management:
  - Minimize waste generation;
  - Maximize the recovery of resources from our waste in a way that fosters the growth of the circular economy; and
  - Design and deliver waste management services that meet the needs of the customer in a cost-effective manner.
- The Roadmap recommends programs, policies and processing capacity that will be required to reach Peel's 3Rs waste diversion target.
- It is anticipated that approved and proposed programs will increase diversion by two percent, approved and proposed policies will increase diversion by four percent, Anaerobic Digestion will increase diversion by five percent and Mixed Waste Processing will increase diversion by up to 20 percent, bringing Peel's overall diversion rate to over 75 percent.
- The projected operating impact of the Roadmap (i.e. the net impact beyond what would be spent if the actions in the Roadmap are not implemented) is approximately $30 million per year (2017$), which could be potentially offset by $10 million savings from Blue Box program and $10 million from termination of contribution to reserves.
- The projected capital requirement is $365 million which could be partially funded through designated reserves (50 million) and from Development Charges ($18 million).
- Subject to Council approval of the Roadmap, detailed implementation plans that set out the preferred implementation approach and timelines for the Actions in the Roadmap along with detailed financial and staffing implications will be presented for approval commencing in 2018, though some initiatives may begin in 2017.

- Subject to Council approval of the Roadmap, staff will report back with a financing plan including consideration of adopting a volume based user fee.

## DISCUSSION

### 1. Background

At a special Regional Council meeting held on October 8, 2015, Regional Council adopted a 3Rs target of 75 percent by 2034 (Council Resolution 2015-741). At the same meeting, Regional Council directed the Waste Management Strategic Advisory Committee to develop a plan to achieve the target.

Between October 8, 2015 and April 6, 2017, Waste Management Strategic Advisory Committee worked closely with staff to examine programs, policies and processing capacity that Peel could adopt to achieve the target. A detailed list of meetings and resolutions between October 8, 2015 and April 6, 2017 is included in Appendix I.

At its April 6, 2017 meeting, the Committee received a report entitled, "Update on the Development of Peel's Plan to Achieve 75 Percent Diversion". Among other things, the report recommended 3Rs programs and policies for endorsement for public consultation. At its April 13, 2017 meeting, Council endorsed the report for public consultation (Council Resolution 2017-288).

The results of the public consultation, the infrastructure needs and the proposed actions to achieve Peel's 75 percent 3Rs diversion target by 2034, are described in Sections 7, 8 and 9 respectively of this report.

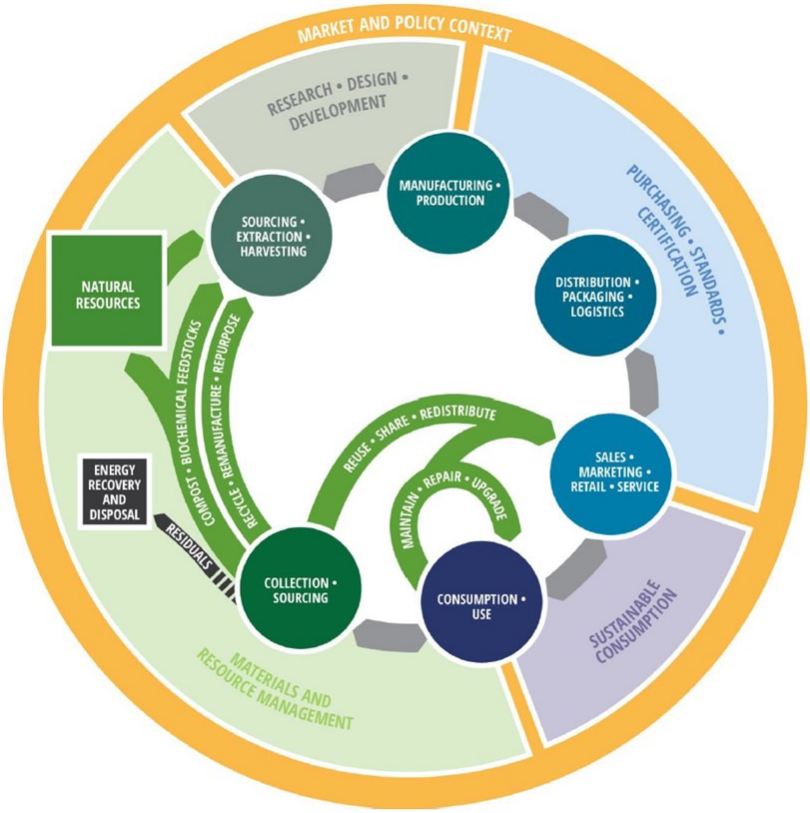
A full copy of the "Roadmap to a Circular Economy in the Region of Peel" is available from the Office of the Regional Clerk for viewing.

### 2. The Circular Economy and Provincial Framework

Our economy currently follows a linear pattern of consumption – resources are extracted, turned into products that are used for only a short period of time and then disposed. This pattern does not recognize the high economic, environmental and social costs of waste and is unsustainable in the long-term. Conversely, a circular economy, as depicted in Figure 1 below, is a system that uses reuse, recycling and remanufacturing to circulate resources in such a manner so as to retain the productive value of materials and products in the economy for as long as possible.

The province has adopted a circular economy approach through the *Waste-Free Ontario Act* and its accompanying Strategy for a Waste-Free Ontario. The Region, along with other municipal and regional governments, has an important role in launching and accelerating the transition to a circular economy. Peel's updated long term waste management strategy, entitled, "A Roadmap to a Circular Economy in the Region of Peel" (the "Roadmap"), supports this transition by setting a clear framework and associated actions to maximize waste reduction and resource recovery in Peel.

Figure 1: Circular economy approach




Source: Circular Economy Innovation Lab

## 3. Goals and Objectives

The Roadmap includes the following Goals and Objectives for Peel.

**Goals:** A circular economy with zero waste from residential sources in the Region of Peel and zero greenhouse gas emissions from residential waste management.

**Objectives:**

- Minimize waste generation
- Maximize the recovery of resources from our waste in a way that fosters the growth of the circular economy
- Design and deliver waste management services that meet the needs of the customer in a cost-effective manner

## 4. Guiding Principles, Planning Horizon, Aligning with Federal and Provincial Acts and Interests, and Integration with other Regional Strategies

### Guiding Principles

The Roadmap includes the following principles to guide the implementation of the Actions in the Roadmap:

1. We will work collaboratively to identify and implement solutions that meet our objectives
2. We will balance the needs of the community, the environment and the economy
3. We will utilize evidence-based decision making
4. We will seek out solutions that are fair and equitable
5. We will treat stakeholders with respect and value diverse opinions, ideas and perspectives
6. We will seek alignment with provincial and federal efforts
7. We will use competitive tension to support a fair and open marketplace

### Planning Horizon

Long-term plans for municipal waste management infrastructure and services typically use a planning horizon ranging from 20 to 30 years because this time frame corresponds well with the development and operational life of infrastructure.

The 2014 Waste Reduction and Resource Recovery Strategy used a 20 year planning horizon to chart the Region's waste management activities to 2034. The Roadmap modifies the planning horizon to align with other infrastructure planning horizons in the Region of Peel and therefore charts activities through to 2041.

Staff recommends that the Roadmap be reviewed every four years and updated every eight years.

### Aligning with Federal and Provincial Acts and Interests

Both the federal and provincial governments have made commitments to take action on climate change and have adopted carbon pricing as the means to move towards a low carbon economy.

In 2016, the Province of Ontario moved forward with two major pieces of legislation (the *Climate Change Mitigation and Low-Carbon Economy Act* and the *Waste-Free Ontario Act*) that will significantly impact how waste is managed in the province. Each of these pieces of legislation has an accompanying strategy which provides more detail on the province's plans – the Climate Action Plan and the Strategy for a Waste-Free Ontario respectively.

The Roadmap and its recommended actions have been developed to ensure alignment with these federal and provincial commitments.

On November 16, 2017 the province posted its proposed Food and Organic Waste Framework. A cursory review suggests the actions recommended in the Roadmap are generally consistent with the Framework but a more detailed review will be undertaken by staff to ensure this is the case. The Food and Organic Waste Framework is discussed in

more detail in the report from the Commissioner of Public Works titled "Update on the Province's Food and Organic Waste Framework" and listed on the November 30, 3017 Waste Management Strategic Advisory Committee agenda.

Staff will continue to support provincial efforts to hold producers responsible for the management of the products at the end-of-life and advocate for programs that maintain the interests of Peel's residents.

**Integration with Other Regional Strategies**

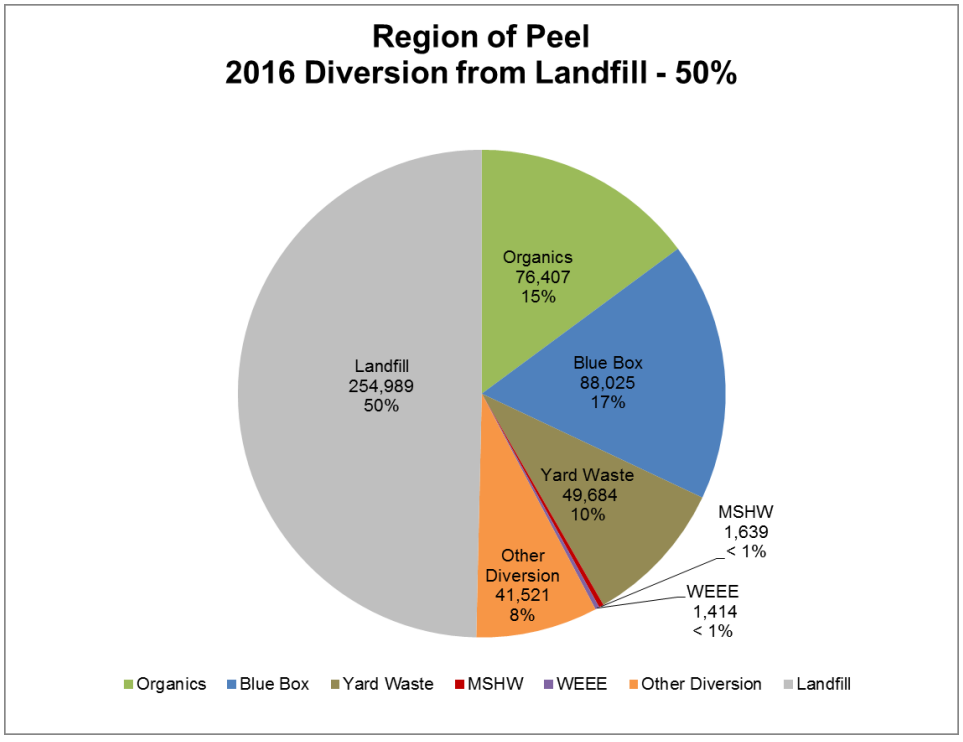
The Region uses an Integrated Planning Framework to guide the development and integration of strategic plans for all Regional programs and services. The following Regional Strategies and Plans informed the development of the Roadmap:

- The Region's Official Plan
- The Region's Strategic Plan
- The Region's Long Term Financial Plan
- The Region's Climate Change Statement of Commitment
- The Region's Corporate Social Responsibility Strategy

## 5. Current Status – 2016 Diversion, Generation and Participation Rates

In 2016, the Region managed just over 500,000 tonnes of residential waste. This included Blue Box recyclables, Green Bin organics, yard waste, other recyclables and garbage. Figure 2 shows that approximately 50 percent of the residential waste was diverted, while the remaining 50 percent was sent to landfill.

Figure 2: 2016 Diversion from Landfill



There are approximately 330,000 curbside households (approximately 1,100,000 residents) and 94,000 multi-residential households (approximately 240,000 residents). Table 1 shows the average generation of waste per household in Peel.

Table 1: Average 2016 Peel Curbside and Multi-Residential Generation Rates

| | Generation per Household |
|---|---|
| Curbside | 996 kg/yr |
| Multi-Residential | 661 kg/yr |

The numbers in Table 1 above reflect residential tonnage only and do not include waste generated in the Industrial, Commercial and Institutional (ICI) sector. In Ontario there are approximately two tonnes of ICI waste generated for every tonne of residential waste. The numbers in table 1 also reflect generation per household. Staff will also track generation per capita to reflect the fact that household size varies within the Region and across the province.

It should be noted that Peel households are larger than their GTA counterparts. Table 2 compares of the number of people per household in the GTA.

Table 2: GTA Persons per Household

| Municipality | Curbside Persons Per Household | Multi-Residential Persons Per Household | Total Persons Per Household |
|---|---|---|---|
| Region of Peel | 3.39 | 2.49 | 3.21 |
| City of Toronto | 2.79 | 2.08 | 2.45 |
| Halton Region | 2.90 | 1.74 | 2.84 |
| Durham Region | 2.86 | 1.93 | 2.83 |

In 2016, 87 percent of Peel households participated in the Blue Box program and 61 percent participated in the Green Bin program, both of which are comparable to other GTA municipalities as depicted in Figures 3 and 4.

Figure 3: Municipal Blue Box Program Participation Rates

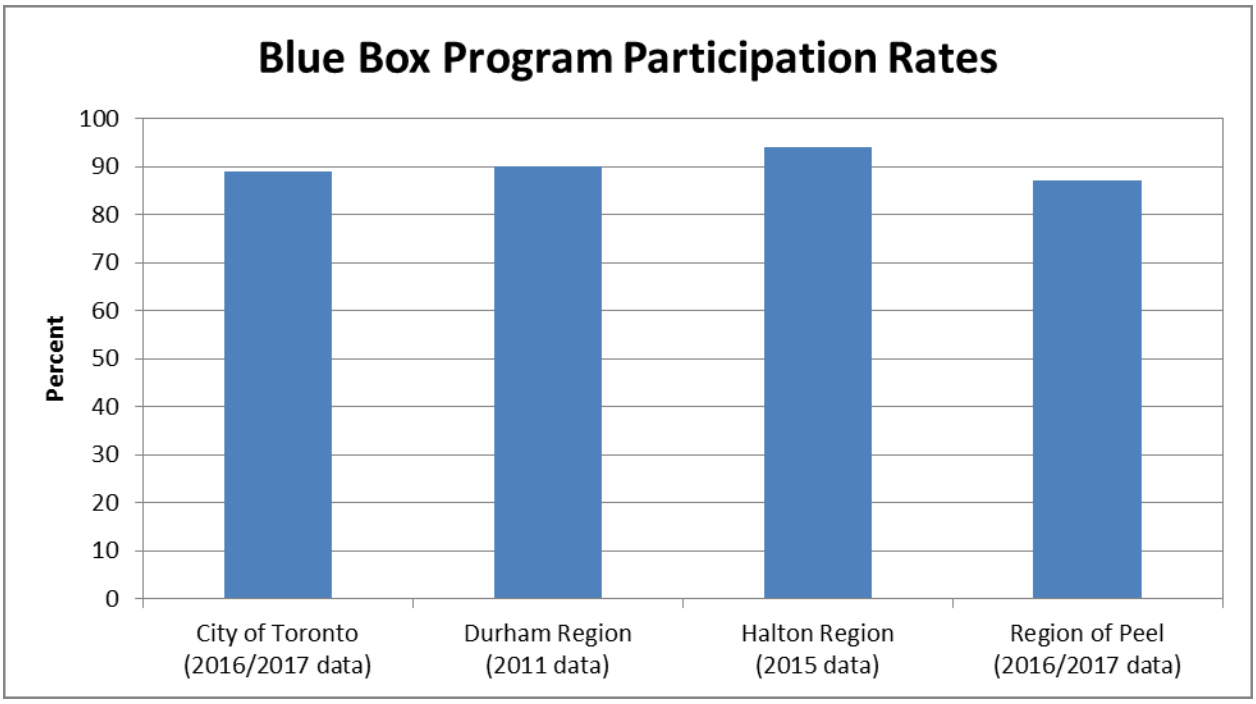
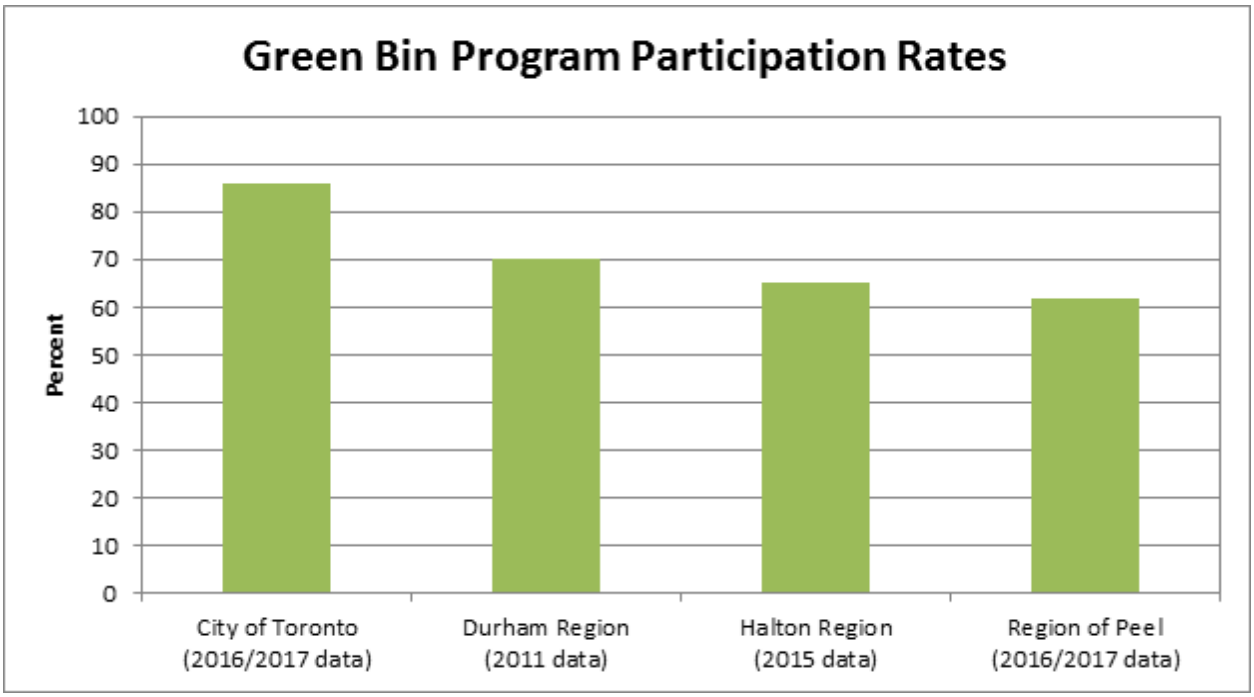
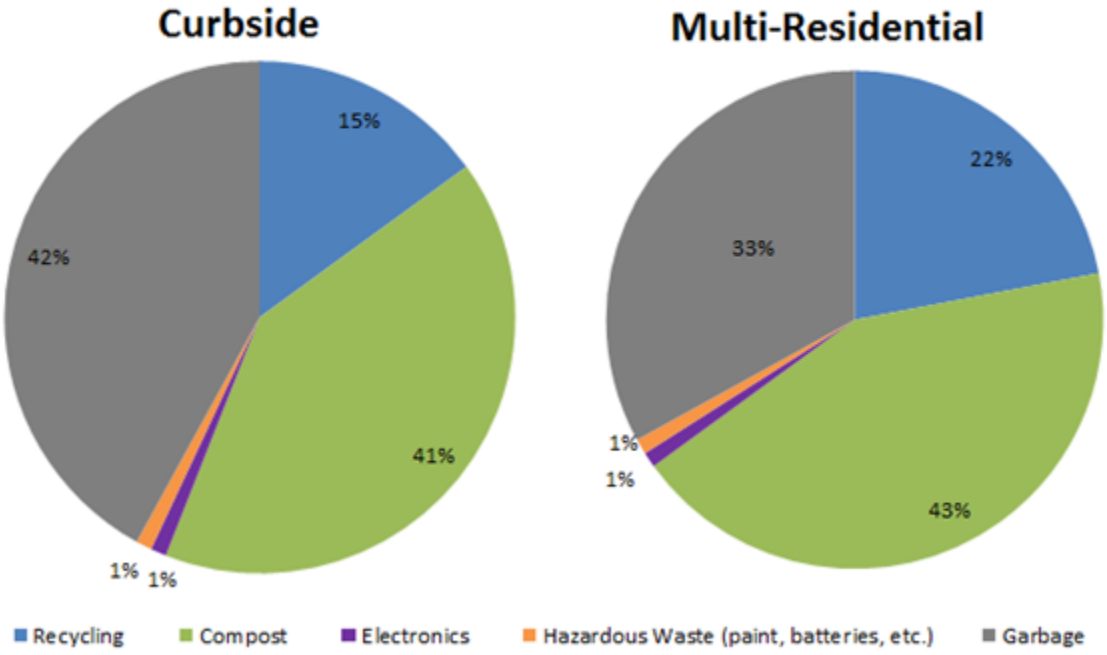



Figure 4: Municipal Green Bin Program Participation Rates



Notwithstanding Peel's participation rates, approximately half of what Peel residents disposed of as garbage was material that could have gone in the Blue Box or Green Bin as shown in the following pie charts in Figure 5:

Figure 5: Garbage Composition




The information above is evidence that there is opportunity to improve Peel's current diversion rate.

## 6. The Process

Staff used a rigorous and methodical approach to develop a Roadmap. Staff identified and evaluated a long list of potential new 3Rs programs and policies from across North America and applied screening and evaluation criteria in a stepwise fashion to systematically shorten the list to the programs and policies recommended in the Roadmap.

Staff also conducted a comprehensive investigation to determine if mixed waste processing could be used to supplement source separation programs by recovering recyclables and organics from Peel's garbage stream. Staff's investigations included waste audits, laboratory analysis of the garbage and a literature review of Mixed Waste Processing. Staff also identified, assessed and visited mixed waste processing facilities in North America and Europe.

The program, policy, and Mixed Waste Processing assessments were made with strategic input from the Waste Management Strategic Advisory Committee and feedback from the public.

This Roadmap includes new programs and new policies to improve source separation and new post collection processing capacity. The Actions from the Roadmap are included in Section 9 of this report.

## 7. Results of Public Consultation

Waste Management Strategic Advisory Committee was asked for feedback and direction at key milestones as the Roadmap was developed. In April 2017, Council endorsed a suite of possible new programs and policies for public consultation.

Feedback was sought from residents through four types of consultation: focus groups, telephone surveys, an online survey and public information centres. General themes that emerged from the public consultation activities are listed below.

- Respondents support and are satisfied with the current waste management system
- Respondents feel that having more information on the Region's current performance and the associated benefits of recycling would help increase resource recovery
- Respondents are in favour of receiving more information on repair and reuse options
- Respondents strongly support additional education in schools and see it as important to instill habits associated with reduction, reuse and recycling at a young age
- There is strong interest in a Region-wide textile recovery program, but there is a preference for the Region to utilize existing not-for-profit organizations for collection rather than creating a new Regional collection program
- Some respondents who live in the multi-residential sector are interested in a multi-residential organics program, but others are concerned about the program due to the inconvenience and negative attitude toward handling food waste as a separate material from garbage
- There is little interest in new bulky item recovery programs (e.g. carpets, furniture, mattresses, etc.), as respondents feel bulky items are already being collected and/or reused through a variety of other means
- Respondents want producers of products and packaging to be responsible for managing these materials at end-of-life
- Respondents are reluctant to pay for new source separation programs if, in the future, those programs are going to be provided by producers
- Respondents generally support positive over negative incentives to encourage effective participation in resource recovery programs. Respondents recognize that penalties could be useful tools, but favour having improperly sorted materials not collected over financial penalties.

For additional details regarding the public consultation, see Appendix II.

## 8. Infrastructure Needs

On July 3, 2014, Regional Council endorsed the existing Waste Management Infrastructure Development Plan (Council Resolution 2014-626). Significant changes affecting the Region's waste management infrastructure requirements have occurred since the 2014 plan was adopted, including:

- Adoption of a 75 percent 3Rs diversion target
- Enactment of the *Waste-Free Ontario Act*

- Acquisition of property for the Anaerobic Digestion Facility
- A recommendation in the Roadmap to develop mixed waste processing capacity

Given the significant impact these changes have on waste management infrastructure requirements an update of the Infrastructure Plan is warranted.

A review and update of the Infrastructure Plan is required to ensure that Peel will have the infrastructure in place to meet its objectives for waste management. An updated infrastructure plan will consider processing capacity requirements for the major material streams and transfer capabilities to support efficient collection and handling of waste materials. The role of the existing waste management facilities will be assessed and where appropriate, changes in function or operation will be recommended. An updated infrastructure plan will also identify the need to acquire new property or easements for waste management infrastructure, if required.

**Anaerobic Digestion**

In 2015 Regional Council approved the development of an Anaerobic Digestion facility (Council Resolution 2015-742). A property located at 7500 Danbro Crescent, in north-west Mississauga was acquired in September 2017 for the Anaerobic Digestion facility. The capacity of the Anaerobic Digestion facility will be 90,000 tonnes per year, which will meet the Region's needs for the foreseeable future. If construction proceeds according to plan, the facility will commence operation in 2023.

Detailed information about the Anaerobic Digestion Facility project is set out in the report of the Commissioner of Public Works, titled "Strategic Terms for the Anaerobic Digestion Facility Project" listed on the November 30, 2017 Waste Management Strategic Advisory Committee agenda.

**Mixed Waste Processing**

On November 19, 2015, the Director of Waste Management introduced the concept of mixed waste processing to the Waste Management Strategic Advisory Committee and advised that processing Peel's garbage stream in a mixed waste processing facility to recover recyclables and organics will be necessary to achieve the Region's 3Rs diversion goal. Mixed waste processing may also be necessary to make Peel's waste management programs compliant with new provincial actions and policies listed in the Food and Organic Waste Framework, in particular the expected ban on disposal of organics.

Staff completed a feasibility study of Mixed Waste Processing to process Peel's garbage as a complement to source separation programs to help meet the Region's target of 75 percent 3Rs waste diversion. The details of the feasibility study are included in Appendix III.

A Mixed Waste Processing concept for Peel that would conform to current and anticipated provincial policy and aid the Region to achieve its 3Rs waste diversion rate target would include the following:

- Recovery of recyclable material of a quality acceptable to established markets;
- Recovery of organics for processing by Anaerobic Digestion or composting to produce compost or fertilizer products meeting the quality requirements for use in Ontario; and

- Production of a fuel product meeting the regulatory and end user quality requirements for use as an Alternative Low Carbon Fuel in Ontario.

Processing all of Peel's garbage by Mixed Waste Processing to recover recyclables and organics is expected to add approximately 20 percentage points to the 3Rs waste diversion rate.

While staff is satisfied based on our analysis and visits to existing facilities, as it is time to introduce Mixed Waste Processing to Ontario, we want to be clear that it will not be perfect, easy or without risk. Across North America (and within Canada) there are many examples of Mixed Waste Processing facilities that did not meet expectations. This is especially true of the low carbon fuel component but also true of the organics fraction. Removing grit and contamination from the organics fraction will not be easy but there are examples in Europe where this is done successfully, so staff believes it can be done. Producing low carbon fuel that consistently meets market specifications is even more difficult, with very few examples of this being done successfully. Experience from existing facilities suggests the commissioning phase could extend over several years, at least for the fuel component. As such, patience and perseverance will be required. Some specific risks that should be resolved prior to procuring Mixed Waste Processing capacity are listed below.

- Mixed Waste Processing may not be able to successfully divert organics if the province applies new product quality requirements that preclude the use of material derived from mixed waste. The quality requirements applicable to the organic output of Mixed Waste Processing must be confirmed.
- The organic output of Mixed Waste Processing may not consistently meet product quality requirements, particularly for heavy metals, so long as items of household hazardous waste are present in the garbage. Programs or policies to eliminate household hazardous waste from the garbage should therefore be maintained and enhanced.
- Mixed Waste Processing may not be able to produce a marketable Low-Carbon Fuel product if the coal-burning industries are unable or unwilling to adjust their fuel quality requirements, particularly with respect to chlorine concentration.

## 9. Proposed and Approved Actions

Based on the research conducted over the past two years, and the feedback received from the public, staff developed and is recommending a number of actions to increase Peel's 3Rs waste diversion rate. The actions have been grouped under the headings programs, policies and processing capacity.

If all programs, policies and processing capacity recommended in the Roadmap are implemented, Peel's diversion rate is expected to increase from 50 percent in 2016 to over 75 percent in 2034 as follows:

- approved and proposed programs will increase diversion by 2 percent
- approved and proposed policies will increase diversion by 4 percent
- the addition of diapers and pet waste to the Green Bin program when the Anaerobic Digestion facility becomes operational will increase diversion by 5 percent
- Mixed Waste Processing will increase diversion by up to 20 percent

It must be noted that patterns of waste generation are largely beyond Peel's control and the forecast for diversion is expected to have some variability year to year. For example, yard waste tonnages fluctuate due to weather, etc. While year to year variability in diversion is expected, it is forecasted that the actions in the Roadmap will ultimately lead to the achievement of Peel's waste diversion target.

The balance of this section outlines the recommended actions, some of which have already been approved by Council.

## Programs

### Action 1: Promote waste reduction activities and benefits

The Region will:

- Continue to promote waste reduction through school workshops and public outreach (as approved by Regional Council: Resolution 2014-627) Promote community repair workshops and support organizations running these workshops
- Support community initiatives that reduce waste including those related to the sharing economy
- Continue to work with the provincial government as they implement the Strategy for a Waste Free Ontario including its direction to promote public education and awareness with respect to waste reduction (as approved by Regional Council: Resolution 2017-630)

### Action 2: Promote food waste reduction activities and benefits

The Region will:

- Continue to promote food waste reduction in schools and to our residents (as approved by Regional Council: Resolution 2014-627)
- Continue to participate in food waste reduction related industry organizations (Ontario Food Waste Collaborative, PACNext) (as approved by Regional Council: Resolution 2014-627)
- Continue to work with the provincial government on their Food and Organic Waste Action Plan, which includes efforts to reduce food waste (as approved by Regional Council: Resolution 2017-630)

### Action 3: Promote existing reuse organizations, opportunities and benefits

The Region will:

- Continue to promote reuse and accept reusable goods at all Community Recycling Centres (as approved by Regional Council: Resolution 2014-627)
- Consider expanding the type of reusable goods accepted at the Community Recycling Centres, through the Community Recycling Centre service analysis recommended in Action 7
- Develop and promote a listing of third-party reuse organizations in Peel
- Promote existing online tools that facilitate goods swapping and reusable purchases

- Promote the benefits of reuse activities through education (as approved by Regional Council: Resolution 2014-627)

**Action 4: Increase resource recovery in Peel's Agencies, Boards, Commissions and Departments (ABCDs)**

The Region will:

- Continue to support local municipalities with their waste reduction and resource recovery efforts (as approved by Regional Council: Resolution 2014-627)
- Phase in an organics recovery program for Peel's long term care centres and Peel's main administration buildings
- Support the Region's other waste reduction and resource recovery activities under its Corporate Social Responsibility Strategy

**Action 5: Expand existing resource recovery programs**

The Region will:

- Continue the process of converting townhomes from a bag-based collection system to a cart-based collection system
- Expand Peel's Green Bin program to include diapers, sanitary products, and pet waste and allow the use of non-compostable plastic liners once Peel's Anaerobic Digestion Facility becomes operational (as approved by Regional Council: Resolution 2015-741)
- Report the results of the multi-residential organics pilot to Regional Council and the Multi-Residential Working Group to help the Region and multi-residential building owners understand the feasibility of Green Bin organics collection in multi-residential buildings
- Reassess the expansion of the Green Bin organics program to multi-residential buildings once the province's Food and Organic Waste Framework has been finalized

**Action 6: Implement new curbside and multi-residential resource recovery programs**

The Region will:

- Pilot test various approaches to third party textile recovery (e.g. semi-annual curbside collection events, additional community drop off boxes, promotion of existing call-in service, etc.) and support the implementation of a Region-wide program based on the results of the pilots
- Pilot test mobile collection of household hazardous waste at multi-residential buildings as approved by Regional Council through the 2017 operating budget

**Action 7: Optimize Peel's Community Recycling Centre services to increase resource recovery**

The Region will:

- Perform a Community Recycling Centre service analysis and report back to Council with recommendations

**Action 8: Improve resource recovery in Business Improvement Areas**

The Region will:

- Improve the resource recovery performance in Business Improvement Areas through education, outreach, and enforcement
- Conduct an organics pilot program to recover organic material from the Business Improvement Areas to help the Region and Business Improvement Area businesses understand the feasibility of organics collection in Business Improvement Areas

**Policies**

**Action 9: Advocate for extended producer responsibility**

The Region will:

- Participate in the discussion on existing provincial 3Rs waste diversion programs (i.e. Blue Box, used tires, waste electronic and electrical equipment and household hazardous waste) as they are transitioned to full producer responsibility under the *Resource Recovery and Circular Economy Act*, 2016 (as approved by Regional Council: Resolution 2017-630)
- Support the development of new provincial extended producer responsibility programs (e.g. carpets, mattresses, furniture, compact fluorescent lightbulbs, etc.) and participate in resulting programs as appropriate (as approved by Regional Council: Resolution 2017-630)

**Action 10: Update our approach to communications, education and outreach to improve the performance of existing curbside and multi-residential resource recovery programs**

The Region will:

- Conduct research on approaches to change residents' behaviour so they are better motivated to properly participate in Peel's resource recovery programs
- Develop a comprehensive Communications Strategy based on the above research
- Implement actions to increase participation and decrease contamination in Peel's Blue Box and Green Bin programs through promotion and education approaches that will be identified in the Communications Strategy

- Review the educational activities conducted by Peel and its community partners, EcoSource and EcoCaledon to ensure they are aligned with the Roadmap and the above Communications Strategy

**Action 11: Update our approach to enforcement to improve the performance of existing curbside and multi-residential resource recovery programs**

The experience of other jurisdictions shows that the use of enforcement, in combination with education, results in higher participation and resource recovery rates than the use of education alone.

The Region will:

- Implement an enforcement pilot program to reduce contamination in the curbside recycling program by checking carts and leaving contaminated carts behind without being collected
- Develop a comprehensive Enforcement Plan based on the findings of the pilot and additional research and report back to Council with recommendations
- Implement actions to increase participation and decrease contamination in Peel's Blue Box and Green Bin programs through education and enforcement approaches that will be identified in the Enforcement Plan

**Action 12: Consider the adoption of a volume based user fee for garbage to improve the performance of existing curbside and multi-residential resource recovery programs**

Experience in other jurisdictions shows that a volume based user fee for garbage can decrease the amount of residential waste disposed of as garbage and increase the amount of Blue Box recyclables and Green Bin organics collected.

The Region will:

- Further investigate the experience of jurisdictions that utilize a volume based user fee for garbage
- Consider various models for a volume based user fee for garbage in the Financial Plan

**Action 13: Update Peel's Waste Collection By-Law and Design Standards**

The Region will:

- Investigate how to best collect material from denser housing developments
- Update the Waste Collection By-Law based on the results of the investigation and to align with the *Waste-Free Ontario Act*, the Strategy for a Waste-Free Ontario and the Food and Organic Waste Framework
- Concurrent with the Waste Collection By-Law update, update the Waste Collection Design Standards Manual to account for denser housing developments and Peel's cart-based collection program based on the results of the investigation and to align with the *Waste-Free Ontario Act,* the Strategy for a Waste-Free Ontario and the Food and Organic Waste Framework

- Collaborate with the local municipalities to ensure that the requirements of the design standards are more effectively incorporated into the development application and approval process

**Action 14: Review and assess Peel's programs, policies and services for improvement on a continuous basis**

The Region will:

- Review operational processes, practices, and service delivery methods on a regular basis to identify opportunities for improved efficiency, effectiveness and customer service
- Collaborate with other municipalities and industry groups to maximize the impacts of our activities and share experiences, expertise and resources
- Review the Roadmap every four years and update it every eight years

**Processing Capacity**

**Action 15: Construct an Anaerobic Digestion Facility to process Peel's Green Bin organic material**

The Region will:

- Continue the development of the Council-approved Anaerobic Digestion Facility to meet Peel's long-term Green Bin organic processing needs

**Action 16: Develop Mixed Waste Processing capacity to recover additional resources, including renewable and low carbon energy, from Peel's garbage**

The Region will:

- Monitor policy, program and other developments affecting Mixed Waste Processing and its output products including, among other things, the provincial Food and Organic Waste Framework which is currently under development
- Create opportunities for tests and trials to increase the knowledge of and familiarity with the organic and low carbon fuel outputs of Mixed Waste Processing to aid the industry to solve technical challenges, and to support the development of markets
- Develop Mixed Waste Processing capacity to process the Region of Peel's garbage stream, subject to confirmation of provincial policy direction, product quality requirements and markets, and further refinement of diversion and cost estimates

**Action 17: Update Peel's Infrastructure Plan to include Mixed Waste Processing capacity, future uses of Peel's existing waste facilities and other new waste management infrastructure**

The Region will:

- Report back with recommendations for the future use of the Peel Integrated Waste Management Facility once the engagements with Infrastructure Ontario and the Greater Toronto Airport Authority are completed
- Prepare a development plan for Mixed Waste Processing capacity
- Prepare a development plan for other new or changing waste management infrastructure
- Report back with an updated infrastructure Plan that includes a recommended implementation approach

## 10. Monitoring, Reporting and Updating

To monitor the progress made under the Roadmap and to inform future business decisions, staff will identify, measure, and regularly report on several key performance indicators. The Region already undertakes a regular review of its waste management systems and consistently collects data on all programs. As programs and services evolve, so too must the key performance indicators used to monitor their performance. As more and more extended producer requirement programs are implemented, Peel will have less control over the design and performance of resource recovery programs and less access to resource recovery data. As such, an overall diversion rate will become less meaningful over time and will therefore be phased out and replaced with capture rates for individual resource recovery programs. This is consistent with how the province measures performance under the *Waste-Free Ontario Act* and Strategy. That said, it is vital that the chosen performance indicators measure our performance in the following areas:

- Waste generation
- Resource recovery
- Customer service

The following key performance indicators (measured and reported separately for curbside and multi-residential programs) will be reported on a yearly basis. Where data is available, these measures will be compared to other municipalities. These high level key performance indicators will be drilled down throughout the Division as required to track and manage individual programs and contracts. As with other aspects of this Roadmap, key performance indicators will be reviewed and updated from time to time to ensure they remain meaningful and useful.

<u>Performance Indicators for Waste Generation</u>

- Total waste (all streams) generated per household
- Food and organic waste generated per household
- Performance will also be tracked on a per capita basis

Performance Indicators for Resource Recovery

- Participation Rate by program (i.e. percentage of households participating in the Blue Box program, Green Bin program etc.)
- Capture Rate by program (i.e. percentage of available materials put in the Blue Box, Green Bin, etc. by residents)
- Contamination Rate by program (i.e. percentage of non-solicited materials in the Blue Box, Green Bin, etc.)
- Tonnage of reusable and recyclable goods recovered at Community Recycling Centres
- Garbage disposed of per household
- Food and organic waste disposed of per household

Performance Indicators for Customer Service

- Percentage of Curbside and Multi-residential respondents rating collection service at satisfactory or better
- Percentage of Community Recycling Centre respondents rating Community Recycling Centre service at satisfactory or better

Other performance indicators that the Region tracks and will continue to track include financial and environmental measures.

- Financial
  - Net operating cost per household
  - Net operating cost per tonne
- Environmental
  - Tonnes of greenhouse gas emitted as a result of residential waste operations

## RISK CONSIDERATIONS

The key risks associated with the Roadmap and ways that these risks will be managed are outlined below.

Programs and Policies

Risks to the implementation and success of the program and policy actions described in the Roadmap include the following:

- The impact of the recommended programs and policies on Peel's diversion rate are based on tonnage and composition projections which are derived from historical tonnages, recent waste composition audits and anticipated industry trends. The projected diversion increases may not be realized if future trends in products and packaging are significantly different from what is projected. Staff will track tonnages and conduct ongoing seasonal waste audits to monitor changes in waste composition and will revise projections if appropriate.
- The recommended programs and policies in the Roadmap are aligned with the current provincial and federal legislation and direction. If provincial and/or federal direction is significantly different than what is currently anticipated, the programs, policies and

processing capacity recommended in the Roadmap may need to be adjusted. Staff will continue to track provincial and federal policy, including the proposed Food and Organic Waste Framework which was posted on November 16, 2017.

- The success of the recommended resource recovery programs assumes (and requires) stable end markets. If stable end markets are not developed, the affected programs and associated processing capacity may have to be modified, deferred, or in some cases cancelled. Staff will continue to work with the province and industry representatives to develop stable end markets and will continue to monitor end market conditions.
- Over time as more materials are designated for extended producer responsibility programs a greater percentage of Peel's residential waste will be managed under programs designed and controlled by Producers. If those programs don't perform as expected, projected diversion rates may change. Staff will remain engaged in the provincial process to designate materials for producer responsibility and will do our best to hold producers accountable.

Anaerobic Digestion Facility

The risks associated with the Anaerobic Digestion Facility project are set out in the report of the Commissioner of Public Works, titled "Strategic Terms for the Anaerobic Digestion Facility Project" listed on the November 30, 2017 Waste Management Strategic Advisory Committee agenda.

Mixed Waste Processing

While staff is satisfied based on our analysis and visits to existing facilities, as it is time to introduce Mixed Waste Processing to Ontario, it is worth reiterating that it will not be perfect, easy or without risk. Across North America (and within Canada) there are many examples of Mixed Waste Processing facilities that did not meet expectations. This is especially true of the low carbon fuel component but also true of the organics fraction. Removing grit and contamination from the organics fraction will not be easy but there are examples in Europe where this is done successfully so staff believes that it can be done. Producing low carbon fuel that consistently meets market specifications is even more difficult, with very few examples of this being done successfully. Experience from existing facilities suggests the commissioning phase could extend over several years, at least for the fuel component. As such, patience and perseverance will be required. Some specific risks that should be resolved prior to procuring Mixed Waste Processing capacity are listed below.

- Mixed Waste Processing may or may not satisfy the requirements of the proposed Food and Organic Waste Framework, in particular, if the Framework includes product quality requirements that preclude products derived from mixed waste. The acceptability of organic outputs from Mixed Waste Processing within the Framework must be confirmed once the Framework is finalized by the province. Staff will continue to monitor the development of the Framework.
- The organic output of Mixed Waste Processing may not consistently meet product quality requirements, particularly for mercury, so long as household hazardous wastes such as batteries and compact fluorescent lightbulbs are present in the garbage. Staff will monitor the quality of the organic output from Mixed Waste Processing and, if appropriate, will enhance education and enforcement to eliminate household hazardous wastes from the garbage.

- Mixed Waste Processing may not be able to produce a marketable Low-Carbon Fuel product if the coal-burning industries are unable or unwilling to adjust their fuel quality requirements, particularly for chlorine content. Staff will continue to work with coal-burning industries to develop the market for Low-Carbon Fuel produced by Mixed Waste Processing.
- The 3Rs recovery rate from Mixed Waste Processing will diminish if, in the future, the garbage contains less recoverable material than is currently projected. Staff will continue to conduct seasonal waste audits to monitor changes in waste composition and will revise projections if appropriate.

## STAFFING IMPACTS

The programs, policies and processing capacity recommended in this Roadmap will require additional staff resources and/or contracted services. The exact impact will not be known until implementation plans are developed as the sequencing, timing and approach to implementing the 17 actions will affect the staffing needs. Specific staffing requirements will therefore be spelled out in the implementation plans.

There are currently 14 contract employees within the division that were hired for the bi-weekly rollout in 2016 and are performing ongoing work associated with the bi-weekly program and the multi-residential organics pilot. The long-term requirement for these contract staff will become clearer in 2018 once the province's Organics Action Plan and Blue Box Transition Plan are better understood and as implementation plans are developed. Staff will bring a report before the 2019 budget process recommending which, if any, of the 14 contract employees should be converted to full time employees.

## FINANCIAL IMPLICATIONS

Table 3 provides an order of magnitude estimate of the capital requirements and the operational impacts of implementing the Roadmap. The programs, policies, and processing capacity will be implemented in future years but the costs are expressed in 2017 dollars. It should also be noted that the table does not include the increase in costs due to inflation or population growth.

The operational impacts will be partially offset by savings from the Blue Box transition and the termination of Reserve Contribution as shown in the table below. The transition of the Blue Box program to producers could result in the elimination of approximately $10 million of Blue Box program costs to the Region. Since the termination of the Energy-from-Waste contract in 2012, Peel has been contributing approximately $10 million annually to a reserve for future waste management infrastructure. This contribution will cease with the implementation of Mixed Waste Processing. The total savings from the transition of the Blue Box program to producers and the end of reserve contributions is expected to be in the order of $20 million.

Table 3: Summary of Operational and Capital Costs of the Roadmap

| | Cost (2017$)/year |
|---|---|
| | |
| **Estimated Annual Operating Impact of the Roadmap** | |
| • Cost of collecting and processing additional material due to new programs and new policies, net of disposal savings | $3,000,000 |
| • Cost of operating Anaerobic Digestion Facility, net of disposal savings | $5,000,000 |
| • Cost of operating Mixed Waste Processing, net of disposal savings | $22,000,000 |
| **Annual Net Operating Impact of the Roadmap** | **$30,000,000** |
| | |
| **Capital Costs Associated with the Roadmap** | |
| • Research and Studies (Included in the 2018 Budget)<br>o Communications Strategy and Community Recycling Centre Service Analysis | $1,000,000 |
| • Anaerobic Digestion facility construction costs (to be included in the 2019 capital budget) | $109,000,000 |
| • Mixed Waste Processing preliminary engineering studies (included in the 2018 capital budget) | $5,000,000 |
| • Mixed Waste Processing construction costs (to be included in a future capital budget) | $250,000,000 |
| **Total Capital Costs** | **$365,000,000** |

A total of $70 million exists in approved capital project 15-6943. Staff recommends that capital project 15-6943 be used for studies, investigations and pilots to support 3Rs diversion, Mixed Waste Processing and the Infrastructure Plan. Additional costs will be identified through the implementation plans.

Experience in other jurisdictions shows that a volume based user fee for garbage can decrease the amount of residential waste disposed of as garbage and increase the amount of Blue Box recyclables and Green Bin organics collected. It will therefore be considered as a policy tool to increase diversion in Peel.

Subject to Council approval of the Roadmap, staff will report back with a Financing Plan that includes consideration of potential Development Charges and a possible volume based user fee for garbage.

## CONCLUSION

Regional Council set a target of 75 percent 3Rs diversion by 2034.

The appended Roadmap recommends new programs, policies, and processing capacity to achieve Council's target.

Once the Roadmap has been approved by Council, staff will develop the following plans, which will confirm resources required and implementation timelines for the programs, policies, and processing capacity:

- Communications Strategy
- Enforcement Plan
- Infrastructure Plan
- Community Recycling Centre Service Strategy
- Financing Plan
- Other program and policy implementation plans as required

Janette Smith, Commissioner of Public Works

**Approved for Submission:**

D. Szwarc, Chief Administrative Officer

**APPENDICES**

Appendix I - Detailed Background of Meetings and Resolutions from the Development of the Roadmap
Appendix II - Public Consultation Results
Appendix III - Mixed Waste Processing Feasibility Study

*For further information regarding this report, please contact Norm Lee, Director Waste Management, extension 4703, norman.lee@peelregion.ca.*

*Reviewed in the workflow by:*

Financial Support Unit

**APPENDIX I**
**ROADMAP TO A CIRCULAR ECONOMY IN THE REGION OF PEEL**

## DETAILED BACKGROUND OF MEETINGS AND RESOLUTIONS FROM THE DEVELOPMENT OF THE ROADMAP

Waste Management Strategic Advisory Committee directed staff to report back with a recommended approach to develop the plan (Council Resolution 2015-781).

At the November 19, 2015 Waste Management Strategic Advisory Committee meeting, the Director of Waste Management presented staff's recommended approach to developing the plan to achieve the 75 percent 3Rs diversion target and to manage the remaining 25 percent of Peel's waste (Council Resolution 2015-942).

At the June 16, 2016 Waste Management Strategic Advisory Committee meeting, staff provided a report and the Director of Waste Management presented additional details on staff's approach to developing the plan to achieve Peel's target.

The development of the plan follows the steps below:

1. Compilation of an inventory of potential new 3Rs programs and policies from North American municipalities with high diversion targets and high diversion rates
2. Screening the inventory using key criteria to identify short list of potential 3Rs programs and policies to be assessed in more detail
3. Detailed assessment of short list to develop a list of recommended 3Rs programs and policies that could be adapted and implemented in Peel
4. Presentation of recommended 3Rs programs and policies to Waste Management Strategic Advisory Committee and Regional Council for endorsement prior to public consultation
5. Public consultation on recommended 3Rs programs and policies
6. Presentation of public feedback on recommended 3Rs programs and policies to Waste Management Strategic Advisory Committee and Regional Council (i.e. this report)
7. Concurrent with the 3Rs programs and policies review, a preliminary review of mixed waste processing facilities (North American and European) to determine current state of mixed waste processing technology and the feasibility of a Mixed Waste Processing approach to supplement resource recovery in Peel Region
8. Presentation of Peel's long term waste management strategy to Regional Council for approval, including contribution of 3Rs programs and policies and processing capacity to achieving Peel's 75 percent 3Rs diversion target by 2034 (i.e. this report)
9. Development of implementation plans for approved 3Rs programs and policies and an updated Infrastructure Plan including Mixed Waste Processing, if approved.

At its July 7, 2016 meeting, Regional Council endorsed staff's recommended approach to develop the plan, along with the implementation of a year-long multi-residential organics program and a mixed waste processing trial (Council Resolution 2016-645).

At its November 17, 2016 meeting, the Committee received a report entitled, "Update on the Development of Peel's Plan to Achieve 75 Percent Diversion". The report presented the Committee with an inventory of 83 3Rs programs and policies from North American municipalities meeting the criteria presented in the June 16, 2016 report. The inventory included programs to reduce waste generation (e.g. repair, reuse, food waste reduction,

etc.), programs to collect new materials (e.g. textiles, mattresses, etc.) and policies to encourage participation in programs (e.g. school-related initiatives, pledges, challenges, levies, fines, user pay systems, etc.).

The November 17, 2016 report also explained that staff used the following criteria to evaluate the 83 programs and policies, resulting in 39 programs and policies being selected for further research and analysis:

- Collects material not currently included in any of Peel's current programs
- Is within Peel's power to implement (i.e. pertains to residential waste, not Industrial, Commercial and Institutional waste, does not require provincial or federal government involvement to implement)
- Is well established (i.e. has at least three years of operational history and is currently in operation)
- Is aligned with the *Waste Free Ontario Act* and Strategy for a Waste Free Ontario: Building the Circular Economy

The report was received by Regional Council on December 8, 2016 (Council Resolution 2016-987).

**APPENDIX II**
**ROADMAP TO A CIRCULAR ECONOMY IN THE REGION OF PEEL**

**PUBLIC CONSULTATION RESULTS**

The Region of Peel undertook a comprehensive public consultation program as a part of the Program and Policy Environmental Scan to Support Waste Management Diversion Targets. The purpose of the consultation sessions was to:

- understand resident opinions regarding the recommended 3Rs programs and policies;
- understand how residents feel 3Rs programs and policies should be implemented; and
- allow residents to identify gaps, issues, barriers, or concerns with the proposed recommendations.

The public consultation program consisted of the following elements:

- Focus Groups;
- Telephone Survey;
- Online Public Survey; and
- Public Information Centres.

The rationale for the multi-phased consultation program was to gather a comprehensive range of input from the public, recognizing the strengths of each approach. The focus group component of the public consultation was conducted as the initial step in the consultation program to allow for a detailed discussion with residents and conduct some qualitative research on their opinions. The findings from the focus group discussions were used to help form the questions that were subsequently used in a telephone survey and online survey. The Public Information Centres were held at the end to get any additional feedback from the public.

Five focus group sessions were conducted, each focusing separately on residents who live in single family homes, residents who live in multi-residential buildings with a waste chute as well as those without a waste chute. Two sessions were conducted in each of Brampton and Mississauga with an additional session in Caledon. Residents were screened to recruit a mixture of different demographic backgrounds.

The telephone survey was completed to undertake quantitative research by polling 600 residents in single family homes and multi-residential units across Caledon, Brampton and Mississauga. The questions from the telephone survey were adapted to an online format to provide residents across the Region with an easily accessible means of participating in the survey and providing feedback.

The online survey was open to residents for approximately one month and received over 640 responses during that period.

As a final step in the consultation process, a series of Public Information Centres were held in Mississauga, Caledon and Brampton. The Public Information Centres were held to provide residents with an opportunity to view informational boards with information on the study and have face to face conversations with members of the project team regarding the proposed recommendations.

**APPENDIX II**
**ROADMAP TO A CIRCULAR ECONOMY IN THE REGION OF PEEL**

**PUBLIC CONSULTATION RESULTS**

## Summary of Key Findings

The following summarizes key findings from the public consultation process.

Textiles

- There is strong support for a more robust textile recycling program.
  - Results from the telephone survey - Eight in ten indicated they would be likely to use the program if textiles were collected at their home or building on a specific date, once or twice a year (86 percent), if they could drop off their textiles at designated drop-off depots in their local community (83 percent), or if they could call in and schedule a textile pick up at their home (80 percent).
  - In the on-line survey - eight in ten (80 percent) indicated they would be likely to use the program if textiles were collected at their home or building on a specific date followed by three quarters (74 percent) who would be likely to use the program if they could drop off their textiles at designated drop-off depots in their local community, and close to two thirds (68 percent) who say they would be likely to use the program if they could call in and schedule a textile pick up at their home.
- The willingness to pay for curbside service is not as well supported as residents have indicated that they do not want to pay more for services. The textile depot option received strong support in the telephone and on-line surveys and could be delivered at minimum cost.
- Address what can be recycled - residents are unaware that they can donate worn textiles and other clothing (shoes, belts, purses, scarves etc.).
  - The telephone survey indicated that close to three quarters (72 percent) say they throw the worn-out textiles in the garbage
  - 71 percent of on-line respondents say they throw out the worn textiles.
- Keep textile messaging simple – “we take it all”
- Residents indicated a preference to deposit unwanted textiles in designated bins located at convenient places such as parking lots of supermarkets or malls, rather than collect curbside due to cost.

Multi-residential Organics

- Residents in multi-residential buildings are looking for an easy way to dispose of organics everyday such as an organics chute. It is noted however that many residents indicated a ‘yuck’ factor related to source separating organics which presents a barrier to participation.
  - From the telephone survey, nearly four in ten (37 percent) say they won’t do this because it requires too much effort
  - From the focus groups -“Even if there was a bin outside of the building, where all the garbage is, I would have to carry it from my house down the elevator or

whatever, and it's going to smell" and "You'd have to take it out constantly; you have to go every day after cooking. So that's just too much."

Repair and Reuse

- There is some support for repair & reuse programs
  - The telephone survey resulted in two thirds (66 percent) of Peel residents indicating they would be likely to participate in the repair & reuse program
  - About half of respondents in the on-line survey indicated that they would participate in repair & reuse programs.

Promotion and Education

- Provide more emphasis on promotion and education to increase awareness of waste diversion opportunities. Use case studies/statistics to generate sense of pride in the program and "did you know" - also provide good news stories.
- Promotion and education content – The public consultation process revealed interest in more information on what can and cannot be recycled, how much waste is currently diverted, the process of recycling, and the tangible benefits from recycling.
  - Results from the telephone survey and on-line surveys are similar - Peel residents agree that they would like to know more information about what can/ cannot be recycled with eight in ten respondents (both surveys) interested in receiving information about exactly what can go in the garbage, recycling, and food waste or green bin, and 76 percent of respondents in the telephone survey and 64 percent of respondents in the on-line survey interested in receiving information about how participating in Peel's recycling and green bin programs benefits the environment. About two thirds of respondents in both surveys are interested in receiving information about how well residents are currently participating in Peel's recycling and green bin programs.
- There is a need to address the attitude that putting non-recyclables in the recycling bin is acceptable because it will be sorted anyway. Messaging should be developed to inform residents of the financial cost to process the non-recyclable materials.
- There is a need to address problematic materials. There appears to be a lot of confusion about some items (coffee cups, plastics) as reflected in focus group comments
  - From a focus group - "I've heard that the paper egg cartons are recyclable, but the plastic are not. I've heard there are eight types of plastic, on the bottom of each container, it looks like a recycling, but in the middle there's a number that indicates the type of plastic. So I just say the hell with it. Which week is it? Let's all just put it in, that one seems more empty than this one. Out it goes."

**PUBLIC CONSULTATION RESULTS**

- Despite the pervasiveness of on-line news and information, the majority of residents participating in telephone survey indicated that they would prefer to receive promotion and education using newsletters and brochures or emails
    - The telephone survey resulted in half (51 percent) of Peel residents claiming they would prefer to receive this information via newsletters and brochures sent through the mail followed at a great distance by just over one quarter (27 percent) who indicate they prefer receiving E-newsletters sent via email.
    - From the on-line survey – "online mentions top the list, with most (56 percent) respondents mentioning they would prefer to receive this information via the Region's website, followed by half (49 percent) who say they would prefer to receive it from E-newsletters sent via email. More than four in ten (44 percent) would prefer to receive information from newsletters and brochures sent through the mail".
- Note, despite 30 percent of Peel residents living in multi-residential buildings, only 2 percent of on-line survey respondents indicated that they resided in multi-residential buildings, suggesting a potential lack of access to on-line resources, low awareness of the on-line survey, apathy and/or language barriers.
- Promotion and education standards need to be established for multi-residential buildings to ensure that proper information is provided to residents about how to recycle/compost and they need to be enforced. The public consultation process identified large differences in the amount of information on recycling and the extent to which recycling was encouraged among participants who lived in multi-residential buildings. On the one hand, some lived in buildings where information on what can and cannot be recycled is provided on posters in common areas, and printed on the blue units for recycling. On the other hand, others lived in buildings where information was non-existent.
- Some attendees at the public information centres mentioned a desire for more 'dynamic' promotion and education as well as a comprehensive marketing strategy.

<u>Curbside Enforcement</u>

- There is general support for enforcement.
    - The telephone survey showed that a considerable majority (72 percent) feel that increased enforcement is a good idea, while only one quarter (26 percent) say it is a bad idea.
- Residents want to be given many warning and a lot of education, before enforcement. Leaving carts behind is preferred to fines as per feedback received in focus group discussions and at the public information centres. Fines were generally not preferred and seen as a measure of last resort.
    - Comments from the focus group – "Well for some people, that's the only way they will learn. Is a fine. So as a very last resort, but, someone has to knock on the door and explain to these people…"

- Provide offenders with information about the problem and how to correct it.
    - Comments from the focus group - “I still think it’s a bit extreme to look at fining people. Because here’s the thing, so when they do it today, they slap that lovely sticker on if you make a mistake. But they don’t actually tell you what the mistake was. They slap a sticker on that you then can’t get back off, by the way. But they don’t tell you what you did wrong. So how are you supposed to correct it, if you don’t know what you did wrong?”
- Enforcement for households that do not set out green bins - start with the requirement of setting out a green bin at least once a month and then transition to bi-weekly.
    - Comments from the focus group – “Even when I owned a house I didn’t compost. It’s just too much of a headache; in the summer you get flies and bugs”
- Consider medical/senior amnesty applications for residents who can’t sort properly.

<u>Multi-residential Enforcement</u>

- Enforcement in multi-residential buildings is generally supported by multi-residential residents.
    - The telephone survey showed that a large majority of Peel residents who live in a multi-residential building agree that knowing that their building’s garbage and/ or recycling can be left behind (79 percent) or that their building can be fined (78 percent) for improperly sorting would compel them to sort items more carefully.

**APPENDIX III**
**ROADMAP TO A CIRCULAR ECONOMY IN THE REGION OF PEEL**

## MIXED WASTE PROCESSING FEASIBILITY STUDY

The Region's 75 percent 3Rs diversion goal will not be achieved by at-source policies and programs alone. Processing Peel's garbage streams to recover recyclables and organics will be necessary to add to the 3Rs diversion achieved at-source to achieve the Region's 3Rs diversion goal, and may be necessary to make Peel's Waste Management Programs compliant with new provincials policies, especially the expected ban on disposal of organics.

Using separation and processing technologies to process garbage to achieve specific environmental or economic outcomes is referred to in the waste industry as Mixed Waste Processing. Modern Mixed Waste Processing facilities are developed to achieve different objectives, depending on local regulations and economic and social conditions.

In Europe and the United Kingdom, development of modern Mixed Waste Processing facilities has been driven by the European Union landfill directive which essentially prohibits the landfill disposal of unprocessed waste. All methods of achieving diversion from landfill are accepted including mass-burn and other combustion-based forms of Energy from Waste. Many European Mixed Waste Processing facilities are designed such that a significant, if not the largest, portion of diversion is achieved through production of Refuse Derived Fuel for Energy from Waste. The capital investment in Mixed Waste Processing and Energy from Waste facilities is justified by significant renewable energy revenues and by the avoidance of high landfill tipping fees or disposal taxes.

In the United States, California is a leader in the development of modern Mixed Waste Processing facilities. In accordance with local diversion policies, Mixed Waste Processing facilities in California are designed to process garbage from Industrial, Commercial and Institutional sources rather than from residential sources. These facilities can effectively recover marketable recyclables and have, until recently, been allowed to report output material used as landfill cover as diversion.

The situation for Mixed Waste Processing is very different in Ontario. At present, Ontario has no policy driver similar to the European Union landfill directive although the *Waste Free Ontario Act* may make it necessary to divert organics from landfill. Unlike other jurisdictions, Ontario policy specifically requires 3Rs diversion which means that Mixed Waste Processing facilities located here would need to be designed to achieve different performance and output quality requirements than are facilities located elsewhere.

Further, energy policies in Ontario would not support the production and use of Refuse Derived Fuel in Energy from Waste facilities as is common elsewhere. In 2016 the province suspended the Energy from Waste Standard Offer program effectively eliminating any opportunity for new Energy from Waste facilities to secure electricity power purchase agreements.

Ontario has, however, followed other jurisdictions in creating policies supporting the production of a more refined Solid Recovered Fuel to displace fossil fuels such as coal. In 2015, the province created the Alternative Low-Carbon Fuel regulation to help industries that rely on coal, such as the cement, lime and steel industries, reduce their carbon emissions. Hereinafter this report will refer to Solid Recovered Fuel meeting the regulatory quality requirements for Alternative Low-Carbon Fuel in Ontario as 'Low-Carbon Fuel'. Many of the coal-burning industrial facilities in Ontario are subject to the carbon emission limits imposed by the provincial Cap and Trade regulation. Use of Low-Carbon Fuel can help coal burning industries to reduce

their carbon emissions and interest in securing supplies of Low-Carbon Fuel is expected to be high in Ontario as it is elsewhere.

Climate change mitigation strategies are increasing international interest in processes to convert waste materials into liquid fuels intended primarily for use in the transportation sector. Enerkem and its Alberta Biofuels Facility in the City of Edmonton is an example of this approach. Feedstock for the Biofuels Facility is produced from residential and other garbage at the City's Integrated Processing and Transfer Facility. The Biofuels Facility uses the feedstock to produce industrial ethanol, the primary use of which is to produce lower carbon emission vehicle fuel blends. The Biofuels Facility project began in 2008 and in September 2017 Enerkem announced that commercial production of ethanol had been achieved.

In recent years a number of similar projects have been announced in the United States and Europe but as of the date of this report none, other than the Alberta Biofuels Facility, has announced the start of commercial fuel production. Several high profile projects have been cancelled or delayed citing falling oil prices and lack of supportive government policies as reasons. Waste to liquid fuels is an approach with potential to produce significant waste diversion and other environmental benefits but which has not yet achieved the level of commercial development necessary to be considered for an energy recovery component of a Mixed Waste Processing approach.

In summary, a Mixed Waste Processing concept for Peel that would conform to current and anticipated provincial policy and aid the Region to achieve its 3Rs diversion goals would include the following:

- Recovery of recyclable material of a quality acceptable to established markets
- Recovery of organics for processing by anaerobic digestion or composting to produce compost or fertilizer products meeting the quality requirements for use in Ontario, and
- Production of Low-Carbon Fuel meeting the regulatory and end user quality requirements for use as an Alternative Low-Carbon Fuel in Ontario.

Staff, aided by consultants, has completed a feasibility study of the use of Mixed Waste Processing for Peel. Key components of the feasibility study were information gathering, assessing potential 3Rs and total diversion, estimating Greenhouse Gas emission reductions and other environmental benefits, estimating costs and identifying key risks. The results of the feasibility study are summarized in the following sections.

## Information Gathering

Compatibility with Provincial Policy

It is expected that Mixed Waste Processing for Peel will align with the *Waste Free Ontario Act and Food and Organic Waste Framework*.

Existing federal and provincial policies are also relevant, particularly policies governing the production and use of organic products and the Alternative Low-Carbon Fuel regulation. Representatives of the Canadian Food Inspection Agency have confirmed that the federal *Fertilizers Act* and Regulations apply to Mixed Waste Processing meaning that, subject to

meeting quality requirements, the organic output of Mixed Waste Processing could be marketed as a fertilizer product. The province has not yet confirmed whether its existing policies governing the beneficial uses of organics derived from waste materials, such as the compost quality standard and the quality requirements under the *Nutrient Management Act*, apply to Mixed Waste Processing, or whether policies specific to Mixed Waste Processing will be developed. The province may, however, clarify this in its Organics Action Framework. Until the province clarifies which policies are applicable, the ability to beneficially utilize the organic output of Mixed Waste Processing remains uncertain.

Similar clarification is required from the province regarding the Alternative Low-Carbon Fuel regulation and whether it applies to the Low-Carbon Fuel that could be produced from Mixed Waste Processing.

A written request for clarification of the above items was submitted to the Ministry of Environment and Climate Change in August 2017, but no response has been received as of the date of this report.

Industry Engagement

Staff issued a Request for Expression of Interest in April, 2017 inviting interested companies or organizations to provide information relevant to the Mixed Waste Processing feasibility study. In total 23 responses were received which indicates that industry interest in delivering a Mixed Waste Processing project is high. Responses were received from companies operating in local and foreign markets and in different industry sectors including technology supply, project development, and facility operations and managing the recovered products.

Respondents who commented on recyclables recommended that recovery be limited to metal and plastic explaining that the quantities of fibre which could be recovered as marketable products are expected to be too low to justify the effort and cost. Respondents who commented on organics recovery described similar processes for extracting Facility Separated Organics, which is a small size fraction material rich in organics but also containing significant contamination. Respondents commented that specialized equipment would be required to clean the Facility Separated Organics but that once cleaned it would be a suitable feedstock for anaerobic digestion. Few respondents reported experience with Low-Carbon Fuel production and suggested that marketing the Low-Carbon Fuel should remain the Region's responsibility.

Respondents who offered comments on commercial terms for a Mixed Waste Processing project indicated a preference for a design-build-operate-maintain contract structure with a minimum 10-year operating term and supported by a minimum supply guarantee from the Region. Some respondents indicated that reasonable recovery rates or other performance requirements could be guaranteed. Foreign-based respondents reported interest in developing a project in Ontario and would create a consortium with local firms to build and operate the facility.

Facility Visits

Staff visited Mixed Waste Processing facilities in Edmonton, California, and Europe. Members of the Waste Management Strategic Advisory Committee joined staff on the European site visits. The Waste Management Strategic Advisory Committee received a presentation summarizing

**APPENDIX III**
**ROADMAP TO A CIRCULAR ECONOMY IN THE REGION OF PEEL**

**MIXED WASTE PROCESSING FEASIBILITY STUDY**

Mixed Waste Processing facility visits on June 29, 2017. The key learnings from the Mixed Waste Processing facility visits were as follows:

- With advanced technology, recovery rates of 80 percent or higher can be achieved for specific recyclables. However, the recovery of recyclables is limited by quality. Source separation provides better quality recyclables and organics. Mixed Waste Processing serves to complement source separation programs.
- Technologies can remove most contaminants, and compost or anaerobic digestion products typically meet the quality requirements for the intended end uses. The digestion of Facility Separated Organics produces biogas at a rate comparable to that of source separated organics. However, European compost quality standards and markets tolerate more contamination than is allowed or accepted in Ontario. The ability of Mixed Waste Processing to produce marketable organic products still needs to be proven in Ontario.
- The European regulatory framework for waste diversion does not translate to Canada or Ontario. Europe acknowledges thermal conversion of Refuse Derived Fuel and the use of recovered organics for landfill cover as diversion.
- Large Mixed Waste Processing facilities can operate successfully in dense urban areas if they are equipped with technologies to control noise and odour. These technologies are proven and are currently in use at waste facilities in Ontario.

<u>Waste Characterization Audits</u>

Seasonal waste characterization audits of Peel's curbside and multi-residential garbage streams were conducted from July 2016 to May 2017.

The purpose of the waste characterization audits was to provide an assessment of the quantity of materials available for recovery by Mixed Waste Processing, and also to produce samples of materials for laboratory analysis which would reveal the expected quality of Mixed Waste Processing output materials.

Staff engaged a waste audit contractor to collect and sort samples of the garbage streams by size (large vs small) and by material type. Staff also engaged a team from the University of Waterloo who advised on the sorting procedures.

The audit results suggest that up to 10 percent of the garbage is recyclable materials potentially recoverable by Mixed Waste Processing, and 40 percent is potentially recoverable as Facility Separated Organics. A further 8 percent is materials that could potentially be directed to Low-Carbon Fuel production. In considering these percentages it must be remembered that they are based on sorting a small number of samples by hand and using simple tools and are therefore only approximations of the results that could be achieved by large-scale processing operations.

<u>Processing Trials</u>

In 2016, Peel entered into an agreement with Canada Fibres Ltd. for a mixed waste processing trial at its material recovery facility on Highway 27 in Vaughan.

The trial began in March and continued until mid-July. A total of 8,000 tonnes of multi-residential and 4,000 tonnes of curbside garbage were processed.

Overall, approximately 3,500 tonnes (30 percent) of the garbage processed was diverted; 400 tonnes (3 percent) were recovered as recyclable metals and mixed rigid plastics, which were supplied to existing markets, and 3,100 tonnes (26 percent) were recovered as Facility Separated Organics, which was supplied to a private facility and processed by anaerobic digestion.

Of the remaining 8,600 tonnes (71 percent) of the garbage processed, 1,500 tonnes (13 percent) were materials potentially suitable for production of Low-Carbon Fuel, and 7,000 tonnes (58 percent) was a material stream with no apparent diversion opportunity. All of this material was landfilled.

As a requirement of the processing trial, the contractor conducted audits of output material streams and submitted samples of Facility Separated Organics and potential Low-Carbon Fuel materials to private laboratories for analysis.

The trial was intended to continue until the end of 2018, but was suspended in mid-July at the request of the contractor because their Facility Separated Organics processing contractor determined that they could not continue due to the large quantity of broken glass and other grit-like contamination in the Facility Separated Organics. The Facility Separated Organics processing contractor has since installed grit removal equipment at its facility and has indicated its welling to recommence the trial, albeit at a lower processing rate.

The diversion of material was steadily improving up until the time that the trial was suspended. As well, exposure to the challenges of processing Facility Separated Organics has been informative for this feasibility study and also for the organic waste processing industry.

Engagement with Potential Low-Carbon Fuel Markets

Cement, lime and steel production are the primary coal-burning industries in Ontario. Staff consulted with representatives of cement and lime plants located in Ontario to understand their interest in and requirements for alternative low-carbon fuel. As of the date of this report it has not been possible to arrange similar consultations with the steel industry. Representatives of the cement and lime industries expressed great interest in alternative low-carbon fuel but were focussing their attention on sourcing industrial waste materials as these materials are available now and have known and consistent quality. Most of the industry representatives reported that they were actively working to incorporate alternative low-carbon fuel into their supply or, if they are already using alternative low-carbon fuel, to increase the supply.

While there are examples of these industries burning Low-Carbon Fuel in other jurisdictions, there are no coal-burning industries in Ontario are currently using Low-Carbon Fuel produced from residential garbage however there is some interest in doing so primarily because of the quantity potentially available and the expected reliability of the supply. None of the industry representatives indicated a willingness to become directly involved in the production of Low-Carbon Fuel from residential garbage at this time but would consider contracting with a supplier for a ready-to-use product if or when available. Industry representatives were not prepared to discuss a price basis for Low-Carbon Fuel.

## MIXED WASTE PROCESSING FEASIBILITY STUDY

Output Quality Analysis

Organics Quality

Samples of small-size fraction organics from the waste characterization audit and samples of Facility Separated Organics from the Mixed Waste Processing trial were submitted to private laboratories and analyzed for the relevant quality parameters set out in the federal and provincial policies mentioned above, and which included contamination and heavy metals. The samples were also analyzed for biomethane potential, which is a measure of the suitability of the material for anaerobic digestion.

The small-size fraction organics and Facility Separated Organics samples were found to be heavily contaminated, with 15 percent or more of the material being broken glass and other grit-like materials. This amount of contamination is significantly greater than that typically found in green bin organics and will require specialized processing operations to remove the contamination to protect processing equipment and to meet existing quality requirements.

Analysis of samples from the waste characterization audit and Mixed Waste Processing trial, and from curbside and multi-residential garbage, yielded similar results. With the contamination removed, analysis of the samples found that heavy metals were generally below the concentration limits set out in the federal and provincial policies however concentration “spikes” were reported in some samples. Concentration “spikes” are not unexpected since the garbage streams contain items known to be sources of heavy metal contamination, such as batteries and compact fluorescent lights.

The results of the laboratory analysis suggest that a Mixed Waste Processing approach capable of effectively removing contamination from Facility Separated Organics is likely to be able to produce compost or fertilizer products that would meet existing provincial and federal quality standards, however the risk of heavy metal contamination remains significant. Expanded efforts to eliminate items of household hazardous waste from the garbage stream, whether through Extended Producer Responsibility or Regional programs, should be in place before Mixed Waste Processing is implemented.

Once the contamination has been removed, laboratory results also indicate that the Facility Separated Organics can be a good feedstock for anaerobic digestion. As indicated by the biomethane potential test results, anaerobic digestion of clean Facility Separated Organics would produce approximately 80 percent of the biogas expected from digestion of the same quantity of green bin organics. Biogas production for conversion to low-carbon, renewable energy is therefore a viable component of a Mixed Waste Processing approach.

Low-Carbon Fuel Quality

There is no comprehensive Low-Carbon Fuel quality standard applicable in Ontario. The Ontario Alternative Low-Carbon Fuel Regulation provides quality standards for minimum energy content and carbon emission intensity (a comparison of the fossil carbon emissions from the Low-Carbon Fuel relative to coal) but does not include standards for other relevant parameters. Each coal-burning industrial facility has its own specific alternative low-carbon fuel quality requirements which reflect its process design and requirements for environmental permitting and product quality. To assess the quality of the Low-Carbon Fuel material samples it was

therefore necessary to compile quality parameters from industry sources and from other jurisdictions, including the European Union's fuel quality standards.

Samples of different types of fibres and plastics obtained from the waste composition audit, and samples of the Low-Carbon Fuel material output stream from the Mixed Waste Processing trial, were submitted to the University of Waterloo team and private laboratories for analysis of solid Low-Carbon Fuel characteristics. Analyses of samples of Low-Carbon Fuel material from the waste characterization audit, the Mixed Waste Processing trial, and from curbside and multi-residential garbage yielded comparable results. The energy content and carbon emission intensity results suggest that a Low-Carbon Fuel from Mixed Waste Processing could satisfy the requirements of the Alternative Low-Carbon Fuel Regulation. Comparing the results to industry requirements suggests that with one exception the quality of the Low-Carbon Fuel could be satisfactory.

The cement industry has the potential to be the largest market for Low-Carbon Fuel from a Peel Mixed Waste Processing facility but needs to limit amount of chlorine in the Low-Carbon Fuel to protect the integrity of their process and equipment.

Laboratory analysis revealed that the chlorine concentrations in some potential Low-Carbon Fuel materials exceeded the concentration limits indicated by the cement industry contacts. Further investigation suggests that the presence of chlorine containing polymers used for packaging (e.g. polyvinyl chloride plastic) or as a component of packaging or products (e.g. polyurethane based adhesives) contribute to the high chlorine concentrations. The chloride salts in food waste may also be a significant source of chlorine in the potential Low-Carbon Fuel materials.

Reducing the chlorine concentration of the Low-Carbon Fuel to the cement industry's acceptability limit by identifying and removing high chlorine-content materials may not be possible, practical or economically justifiable. Similarly, supplementing the production of Low-Carbon Fuel with low chlorine materials from other sources may not be a solution to this challenge.

The cement industry has the ability to modify their process to accommodate higher chlorine-content materials although the investments required are reported to be significant. Whether the cement industry is willing to make the necessary investments, and other considerations such as the value of the Low-Carbon Fuel compared to its cost of production, will determine whether production of Low-Carbon Fuel is a feasible energy recovery component of a Mixed Waste Processing concept for Peel.

Processing the Low-Carbon Fuel materials to meet industry's requirements for consistency, particle size, purity and other requirements could not, for practical reasons, be investigated as part of the feasibility study. Purity may be a particular challenge as some industry representatives reported very low tolerances for metal, glass or other non-Low-Carbon Fuel materials in the Low-Carbon Fuel product.

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**ROADMAP TO A CIRCULAR ECONOMY IN THE REGION OF PEEL**

**MIXED WASTE PROCESSING FEASIBILITY STUDY**

**3Rs and Total Diversion**

Garbage Tonnage and Composition Projections

Waste Management maintains long-term projections of the future tonnage and composition of the major waste streams, recycling, organics, yard waste and garbage, which are used for a variety of planning purposes. When planning supports recommendations regarding investments in large-scale infrastructure, a long-term planning horizon is used. For the Mixed Waste Processing feasibility study, a 20-year planning covering the period 2025 to 2045 was used.
The projected future tonnages of curbside and multi-residential garbage over the planning horizon revealed that 250,000 tonnes per year would be the correct scale at which to consider the feasibility of a Mixed Waste Processing approach for Peel.

Uncertainty in future projections is unavoidable since factors affecting patterns of waste generation cannot be predicted accurately. Particularly relevant for the Mixed Waste Processing feasibility study is the uncertainty inherent in the projections of future garbage composition since it is the proportion of potentially recoverable materials present in the garbage streams that ultimately limits the 3Rs and total diversion potential of a Mixed Waste Processing approach. All current trends suggest that the proportion of potentially recoverable materials in the garbage streams is likely to decrease over time which, depending on the magnitude of the decrease, could reduce the diversion performance of a Mixed Waste Processing approach.

Mixed Waste Processing Scenarios
Mixed Waste Processing facilities can be designed to satisfy different objectives or achieve different outcomes. For the feasibility study the following two Mixed Waste Processing scenarios were considered:

- A maximum 3Rs diversion scenario which recovers metals and recyclable rigid plastic containers for recycling and Facility Separated Organics for anaerobic digestion, and which processes all recovered fibre by anaerobic digestion with the Facility Separated Organics, and
- A maximum total diversion scenario which recovers metals and recyclable rigid plastic containers for recycling and Facility Separated Organics for anaerobic digestion, and which recovers all of the fibre and some of the remaining plastics as a Low-Carbon Fuel.

The diversion that could be achieved by each of the two Mixed Waste Processing scenarios was estimated using the projections of future garbage tonnage and composition and is summarized in the Table below.

Table: Estimated Percentage of Garbage Diverted by Mixed Waste Processing Scenario

| Diversion Action | Maximum 3Rs Diversion Scenario | Maximum Total Diversion Scenario |
|---|---|---|
| Recyclables Recovery | 10 | 10 |
| Organics Recovery | 35 | 30 |
| Total 3Rs Diversion | 45 | 40 |
| Low-Carbon Fuel Production | - | 10 |
| Total Diversion | 45 | 50 |

## MIXED WASTE PROCESSING FEASIBILITY STUDY

Both Mixed Waste Processing scenarios assume that 75 to 85 percent of targeted recyclables, specifically metals and rigid plastics containers, can be recovered. Recovering the targeted recyclables would enable Mixed Waste Processing to divert up to 10 percent of the processed garbage as marketable recyclable materials and would add approximately 5 percent to the Region's 3Rs diversion rate. For other recyclable materials present in the garbage streams, such as fibres, the quantities which could be recovered as marketable products are expected to be too low to justify the effort and cost.

For the maximum 3Rs diversion scenario, it is estimated that up to 35 percent of the processed garbage could be diverted through organics recovery. This estimate is based on recovery of approximately 60 percent of the organics, diapers, sanitary products and pet waste, and 80 percent of the fibre, present in the garbage, and also includes diversion achieved through moisture loss. Diverting up to 35 percent of the processed garbage through organics recovery would add approximately 17 percent to the Region's 3Rs diversion rate. In total, the maximum 3Rs diversion scenario would add approximately 20 percent to the Region's 3Rs diversion rate (note: the addition to the Region's diversion rate from recovery of recyclables and organics is approximately 5 percent and 17 percent respectively for a total of 22 percent which has been rounded down to 20 percent for simplicity of reporting).

In the maximum total diversion scenario fibre is directed to Low-Carbon Fuel production and therefore this scenario would contribute slightly less to the Region's 3Rs diversion rate, up to 15 percent for a total 3Rs diversion of approximately 20 percent. In this scenario up to 10 percent of the garbage processed would be diverted to Low-Carbon Fuel production (fibre and some plastic) which would add approximately 5 percentage points to the Region's total diversion rate. In total, the maximum total diversion scenario would add approximately 25 percent to the Region's total diversion rate.
As mentioned above, these estimates of the diversion potential of Mixed Waste Processing are susceptible to the uncertainty inherent in the projections of future garbage tonnage and composition. If the actual proportion of recoverable material present in the garbage in future years is less or more than is currently projected, the 3Rs diversion performance of Mixed Waste Processing will proportionally better or worse than is currently estimated. If, over time, 3Rs diversion is reduced, it may be possible to maintain total diversion performance by initiating or directing more material to Low-Carbon Fuel production.

### Greenhouse Gas and Other Environmental Benefits

Anaerobic Digestion of Facility Separated Organics will produce biogas which is a renewable, low-carbon energy source and can be used to generate heat or electricity, or refined to produce Renewable Natural Gas. Anaerobic Digestion of the Facility Separated Organics recovered from Peel's garbage streams is expected to generate enough biogas to produce approximately 5 million cubic metres of Renewable Natural Gas annually, which would contain the same quantity of energy as just over 5 million litres of gasoline.

Achieving waste diversion through Mixed Waste Processing has the added benefit of reducing Greenhouse Gas emissions by recycling more materials, by diverting more organics from landfill, and by producing low-carbon fuels; Renewable Natural Gas and Low-Carbon Fuel. The contribution of Mixed Waste Processing towards achieving the Region's Greenhouse Gas reduction targets will be included in an updated Climate Change Master Plan expected in 2018.

## MIXED WASTE PROCESSING FEASIBILITY STUDY

### Costs

In order to process all of its garbage, Peel would need to secure 250,000 tonnes per year of Mixed Waste Processing capacity. Options for securing Mixed Waste Processing capacity are developing a wholly Region-owned facility, partial ownership of a facility developed in partnership with other municipalities or private companies, and procuring capacity at a privately-owned facility.

The capital cost of a 250,000 tonnes per year Mixed Waste Processing facility is estimated to be $250 million, excluding land. The cost to operate and maintain the facility and manage output materials, excluding potential revenues from the sale of recyclables, Renewable Natural Gas or Low-Carbon Fuel, is estimated to be in the range of $190 per tonne. All estimated costs are expressed in 2017 dollars.

### Risks

The Feasibility study revealed how uncertainty with respect to current or future conditions creates significant risks for the successful implementation of Mixed Waste Processing for Peel. Below is a summary of the most significant risks, and how they might be avoided, eliminated or managed.

Regulatory Policy Changes

Mixed Waste Processing may not help the Region to satisfy the requirements of new provincial policies, in particular the forthcoming *Waste Free Ontario Act and Food and Organic Waste Framework*. This risk would be eliminated when the new policies are announced and it is confirmed that Mixed Waste Processing is allowed.

Product Quality

Mixed Waste Processing may not be able to successfully divert organics if the province applies new product quality requirements. This risk would be eliminated if the province confirmed that existing product quality requirements apply to Mixed Waste Processing, or a risk management approach could be developed if new quality requirements were to be established. The Ministry of Environment and Climate Change has been asked to confirm the quality requirements applicable to Mixed Waste Processing.

The organic output of Mixed Waste Processing may not consistently meet product quality requirements, particularly for heavy metals, so long as items of household hazardous waste are present in the garbage. This risk could be minimized by expanding or enhancing programs or policies to eliminate these materials from the garbage.
Mixed Waste Processing may not be able to produce a marketable Low-Carbon Fuel product if the coal-burning industries are unable or unwilling to adjust their Low-Carbon Fuel quality requirements, particularly with respect to chlorine concentration. This risk can be avoided by adopting a maximum 3Rs diversion objective for Mixed Waste Processing as described above. Low-Carbon Fuel production could be added later if and when compatible quality requirements are established by the industrial users, or if additional research revealed how Low-Carbon Fuel quality could be effectively and practically improved.

**MIXED WASTE PROCESSING FEASIBILITY STUDY**

Technological Capability

Mixed Waste Processing may not be able to successfully divert organics if processing technologies cannot effectively and reliably remove the quantity and type of contamination present in the Facility Separated Organics. Since no organics processing facilities in Ontario are specifically equipped to process Facility Separated Organics, the capability of contaminant removal technologies could not be confirmed. Engagement with the industry and the investigation of European Mixed Waste Processing facilities suggests that effective contaminant removal is possible. This risk would be minimized if additional research identified effective contaminant removal technologies.

Garbage Projections

Mixed Waste Processing may not be able to achieve or maintain the expected diversion rates in the future if the garbage contains significantly less recoverable material than is currently projected. Good quality information gained through an ongoing seasonal waste audit program is necessary to manage this risk. With good information, plans for effectively dealing with changing composition, perhaps through process modifications, can be created.

Costs

The actual capital and operating costs of Mixed Waste Processing may differ significantly from current estimates. The estimated costs reported above are based on minimal information and contain significant uncertainty. This risk can be minimized by developing Mixed Waste Processing facility designs which will enable more accurate cost estimation.

**Summary**

Mixed Waste Processing has the potential to complement the existing at-source policies and programs and add significantly to the Region's 3Rs diversion and may be the only practical method of diverting significant proportion of multi-residential organics from disposal. Mixed Waste Processing is not a viable replacement for existing at-source policies and programs. It is unlikely that a Mixed Waste Processing approach alone can achieve the Region's 3Rs goal and it is doubtful that cost savings would result.

Combined with new and enhanced at-source 3Rs policies and programs, a Mixed Waste Processing approach designed for maximum 3Rs diversion would enable the Region to achieve its 75 percent 3Rs diversion target.

However, the risks described above should be satisfactorily resolved before a decision to procure a Region-owned Mixed Waste Processing facility is made. Staff recommends, therefore, that Mixed Waste Processing for processing Peel's residential garbage be included in the updated infrastructure plan for waste management with procurement to proceed only subject to satisfactory resolution of policy, product quality and other key risks.

Actions to be completed by staff to resolve key risks include:

- monitor provincial and federal policy developments with respect to the acceptability of Mixed Waste Processing and the quality requirements applicable to the organic outputs of Mixed Waste Processing

- monitor the expansion and effectiveness of programs to eliminate items of household hazardous waste from the garbage
- continue the engagement with potential Low-Carbon Fuel markets to assess quality requirements and market potential
- create opportunities for tests and trials to increase the knowledge of and familiarity with the organic and Low-Carbon Fuel outputs of Mixed Waste Processing to aid the industry to solve technical challenges, and to support the development of markets
- continue seasonal waste audits including the collection and analysis of material samples, and
- develop conceptual and pre-engineering designs for Mixed Waste Processing facilities and cost estimates.

In addition, staff will monitor the development of technologies to convert wastes to liquid fuels and will reassess the feasibility of including technologies of this type as an energy recovery component of a Mixed Waste Processing concept for Peel.

The result of the above investigation should inform a broader plan for Mixed Waste Processing to be included in the waste management Infrastructure Plan.

# Roadmap to a Circular Economy in the Region of Peel

**Waste Management Strategic Advisory Committee**
**November 30, 2017**

Norman Lee,
Director, Waste Management
Region of Peel

# Background

- October 8, 2015 RC Meeting
  - Regional Council adopted a 3Rs Waste Diversion target of 75% by 2034 (Council Resolution 2015-741)
- October 22, 2015 RC Meeting
  - Regional Council directed staff to report back to Waste Management Strategic Advisory Committee (WMSAC) with an approach to develop the plan to achieve the 75% target (Council Resolution 2015-781)
- April 13, 2017 RC Meeting
  - Regional Council endorsed a staff report setting out recommended 3Rs programs, policies and processing capacity for public consultation (Council Resolution 2017-288)

# Provincial Framework

- Peel operates (and must operate) within the province's regulatory framework:
  - The Municipal Act
  - The Planning Act
  - The Environmental Assessment Act
  - The Environmental Protection Act

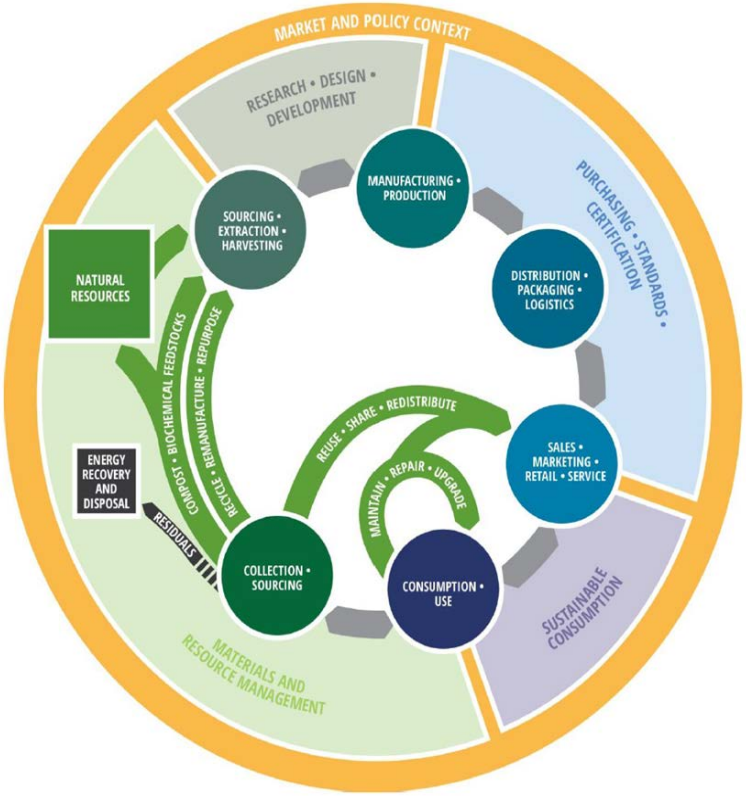
- And…
  - The Waste Free Ontario Act
    - Resource Recovery and Circular Economy Act
    - Waste Diversion Transition Act
    - Strategy for a Waste Free Ontario: Building a Circular Economy
      - Proposed Food and Organic Waste Framework

- The Roadmap fits within this framework

# The Circular Economy

- The underlying objective of the *Waste-Free Ontario Act* and the Roadmap is to create a Circular Economy

- A circular economy is a system that continually circulates resources to retain their productive value in our economy for as long as possible



# Roadmap Goals and Objectives

- Goals
  - A circular economy with zero waste from residential sources in the Region of Peel; and
  - Zero greenhouse gas emissions from residential waste management.

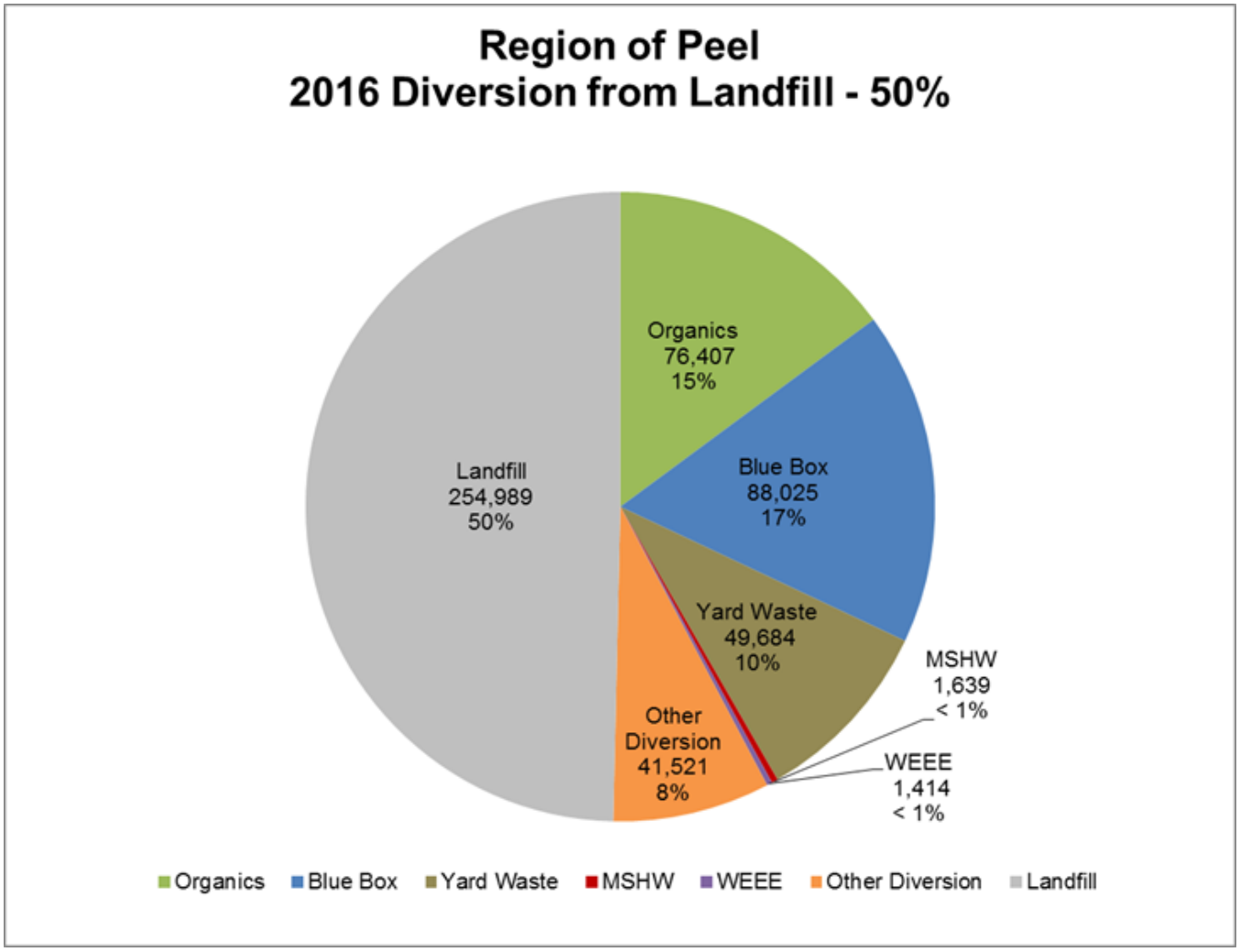
- Objectives
  - Minimize waste generation
  - Maximize the recovery of resources from our waste in a way that fosters the growth of the circular economy
  - Design and deliver waste management services that meet the needs of the customer in a cost-effective manner

# Roadmap Planning Horizon

- The Roadmap uses a 2041 planning horizon to align with provincial growth forecasts and other infrastructure planning horizons in the Region

- Staff recommends that the Roadmap be reviewed every four years and updated every eight years

# Peel's 2016 3Rs Diversion Rate



# Peel Residential Waste Generation Rates

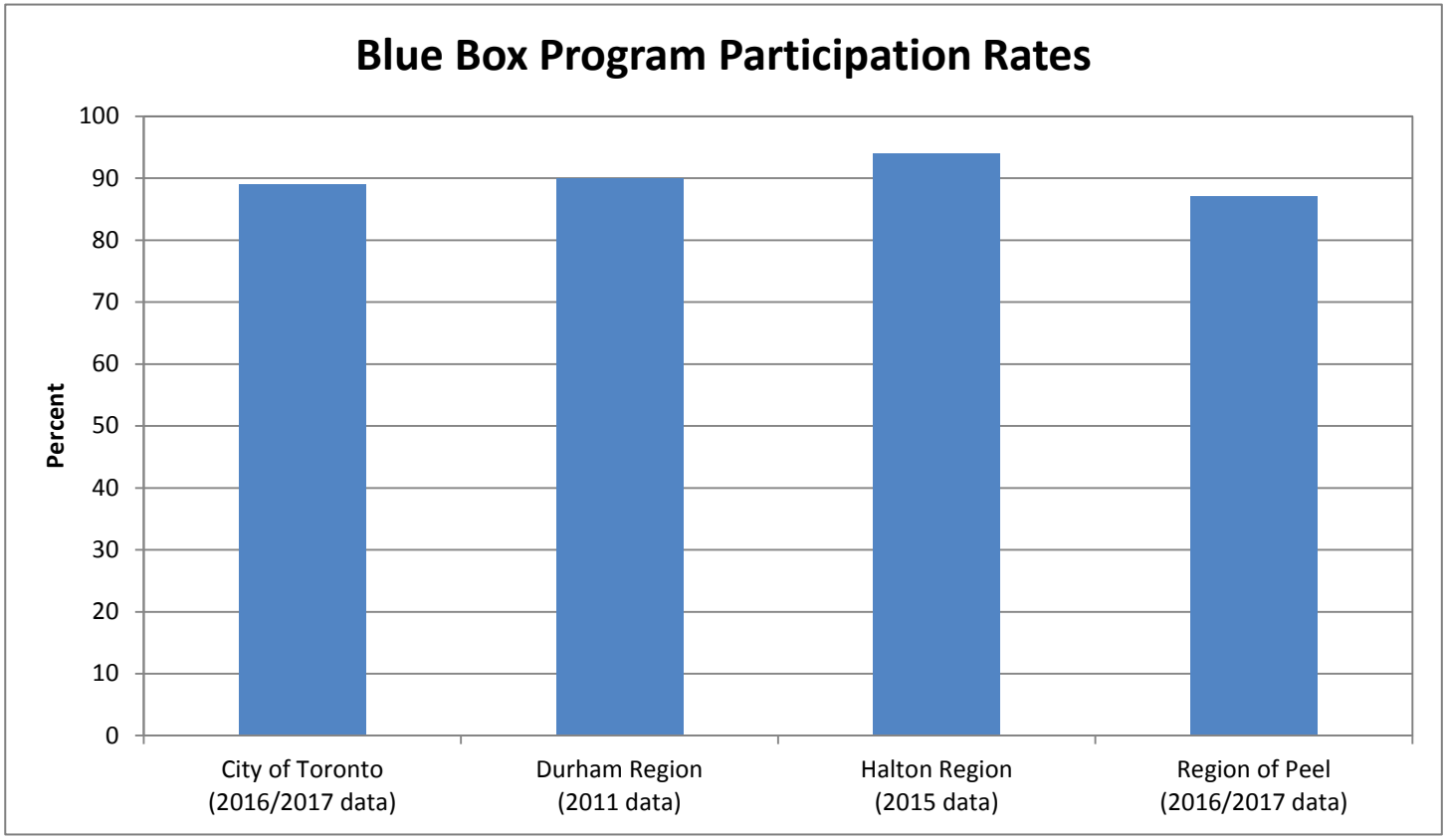
| | Generation per Household |
|---|---|
| Curbside | 996 kg/yr |
| Multi-Residential | 661 kg/yr |

The table above shows residential waste generation only and does not include Industrial, Commercial and Institutional waste generation.

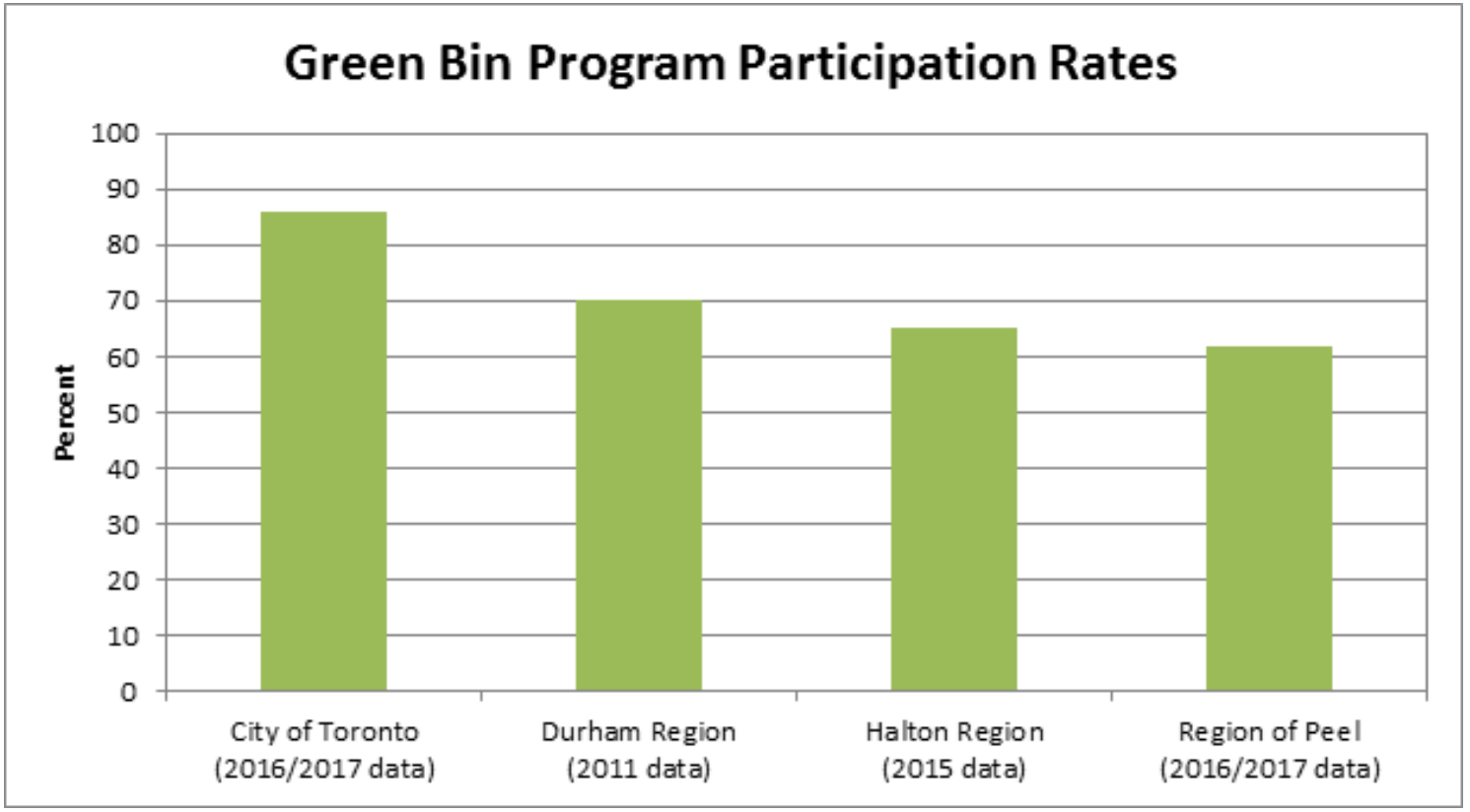
The table below shows that Peel has the highest number of people per household in the Greater Toronto Area.

| Municipality | Curbside Persons Per Household | Multi-Residential Persons Per Household | Total Persons Per Household |
|---|---|---|---|
| Region of Peel | 3.39 | 2.49 | 3.21 |
| City of Toronto | 2.79 | 2.08 | 2.45 |
| Halton Region | 2.90 | 2.74 | 2.84 |
| Durham Region | 2.86 | 1.93 | 2.83 |

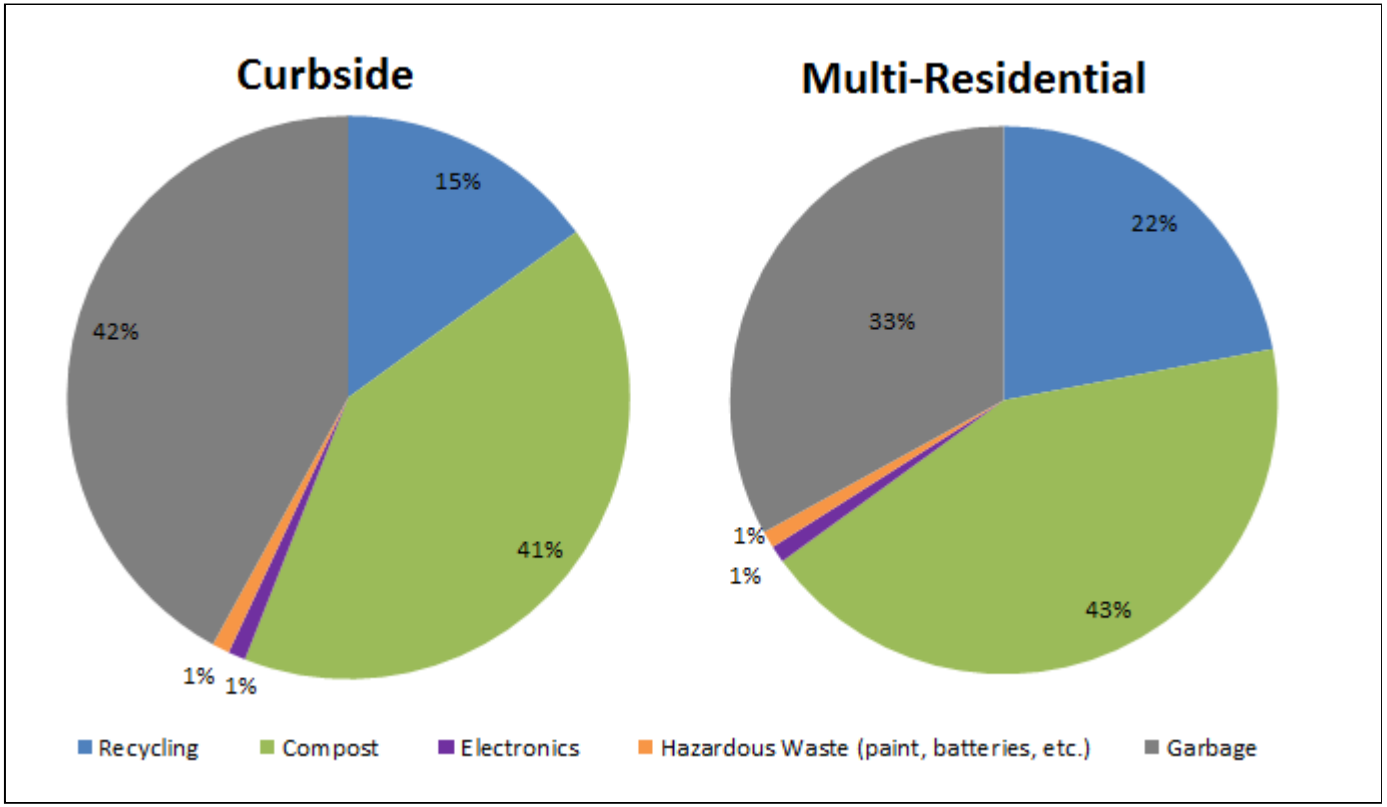
# Blue Box Participation Rate



# Green Bin Participation Rate



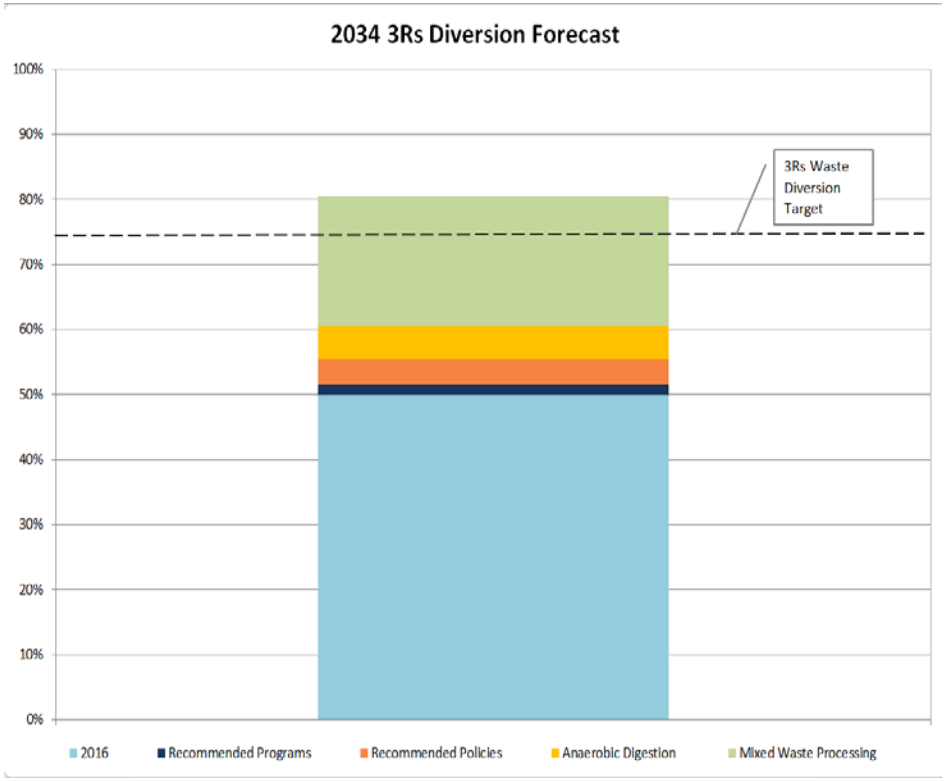
# Peel Garbage Composition



# Programs, Policies, and Processing Capacity

- In April 2017, Council endorsed a suite of new programs, policies and processing capacity for public consultation

- The Roadmap includes a number of recommended actions which will increase Peel's 3Rs diversion rate from 50% today to over 75%
  - New programs – 2%
  - New policies – 4%
  - Anaerobic digestion – 5%
  - Mixed waste processing – 20%



# Public Consultation Process

- Public feedback was sought and received through:
  - Focus groups
  - Telephone survey
  - Online survey
  - Public Information Centres

# Public Consultation Findings

- Respondents are generally satisfied with the current waste management system
- Respondents generally support the recommended programs and policies
- Respondents are reluctant to pay for new source separation programs if:
  - Programs are going to be provided by producers in the future
  - Programs can be provided free of charge by a third party
  - Programs can be provided more economically at CRCs

# Recommended Actions - Programs

- Promote benefits of waste reduction and reuse
- Promote benefits of food waste reduction
- Implement new resource recovery programs
  - (e.g. textiles, carpets, mattresses, furniture, compact fluorescent lightbulbs, batteries, etc.)
  - Consider multi-residential organics once the Framework is finalized
  - Add diapers and pet waste to Green Bin organics program once Anaerobic Digestion facility is operational
- Optimize Peel's Community Recycling Centre services to increase resource recovery
- Help improve resource recovery in Business Improvement Areas
  - (e.g. Pilot Green Bin organics collection)

# Recommended Actions – Policies

- Advocate for Extended Producer Responsibility
- Update our approach to communications, education and outreach
- Update our approach to enforcement
- Consider the adoption of a volume based user fee for garbage to improve the performance of existing curbside and multi-residential resource recovery programs
- Update Peel's Waste Collection By-Law and Design Standards

# Actions –Processing Capacity

- Construct an Anaerobic Digestion Facility
- Develop Mixed Waste Processing capacity
- Update Peel's Infrastructure Plan

# Key Performance Indicators

- Waste generation
  - Total waste generated per household (by stream)
  - Food and organic waste generated per household

- Resource recovery
  - Participation Rate by program
  - Capture Rate by program
  - Contamination Rate by program
  - Garbage disposed of per household
  - Food and organic waste disposed per household

Key Performance Indicators will be reviewed and updated from time to time to ensure they remain meaningful and useful

✸ KPIs will be tracked for curbside and multi-residential separately

✸ KPIs will be tracked per household and per capita

# Risk Considerations

- Staff identified risks and ways to manage the risks associated with the recommended programs, policies, and material processing

- Key risks include uncertainties with respect to provincial legislation, development of end markets for new products and effectiveness of new processing technologies

# Financial Implications (2017$)

| | |
|---|---|
| **Annual operating impact of the Roadmap** | **$30,000,000** |
| Less potential savings from Blue Box Transition | -$10,000,000 |
| Less savings from stopping reserve contributions | -$10,000,000 |
| **Annual net operating impact of the Roadmap** | **$10,000,000** |

| | |
|---|---|
| **Capital cost associated with the Roadmap** | **$365,000,000** |
| Less contributions from reserves | -$50,000,000 |
| Less potential development charges | -$18,000,000 |
| **Net capital cost associated with the Roadmap** | **$297,000,000** |

# Next Steps

- Subject to approval of the Roadmap, staff will develop:
  - Communications Strategy
  - Enforcement Plan
  - Infrastructure Plan
  - Community Recycling Centre Service Strategy
  - Financing Plan
- The plans will confirm resources required and implementation timelines for the programs, policies, and processing capacity

# Thank you

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# REPORT
# Meeting Date: 2017-11-30
# Waste Management Strategic Advisory Committee

## For Information

DATE: November 21, 2017

REPORT TITLE: **UPDATE ON THE TRANSITION OF THE BLUE BOX PROGRAM AND USED TIRES PROGRAM TO FULL PRODUCER RESPONSIBILITY**

FROM: Janette Smith, Commissioner of Public Works

**OBJECTIVE**

To update Council on the transition of the Blue Box Program and the Used Tires Program to full producer responsibility.

**REPORT HIGHLIGHTS**

- The *Waste-Free Ontario Act, 2016* was proclaimed in November 2016, and the accompanying Strategy for a Waste-Free Ontario was adopted in February 2017.
- The Act allows for the transition of the four existing waste diversion programs (Blue Box Program, the Used Tires Program, the Municipal and Special Hazardous Waste Program and the Waste Electronics and Electrical Equipment Program) to full producer responsibility.
- The Used Tires Program was identified in the Strategy as the first program to transition to full producer responsibility. Transition is underway with the wind-up plan for the existing Used Tires Program and the new Used Tires Regulation in development. The existing Used Tires program will cease operations on December 31, 2018, and the new Used Tires Program will be implemented on January 1, 2019.
- The Blue Box Program was identified in the Strategy for transition in 2023. Municipalities and producers asked for an earlier transition.
- As a result, on August 14, 2017 the Minister of the Environment and Climate Change directed Stewardship Ontario to develop a proposal for an amended Blue Box Program Plan to accelerate the transition of the program to full producer responsibility and serve as a blueprint for a new regulation under the new Act. The proposal is expected to be submitted to the Minister for approval in February 2018.
- The development of the amended Blue Box Program is occurring at a fast pace. Staff is actively participating in consultations directly and through Municipal associations, to ensure Peel's interests are considered.

**DISCUSSION**

**1. Background**

In November 2016, the *Waste-Free Ontario Act, 2016* was proclaimed. The *Waste-Free Ontario Act, 2016* enacts the *Resource Recovery and Circular Economy Act, 2016* and the *Waste Diversion Transition Act, 2016*. The *Resource Recovery and Circular Economy Act* allows the Minister to introduce regulations to make producers fully responsible for resource

recovery and waste reduction associated with their products and packaging. The *Waste Diversion Transition Act* allows for the wind-up of the four existing waste diversion programs: the Blue Box Program, the Used Tires Program, the Municipal and Special Hazardous Waste Program and the Waste Electronics and Electrical Equipment Program.

The regulations introduced under the *Resource Recovery and Circular Economy Act* will make producers responsible for 100 percent of program costs and operations. Under this structure, there is no mandated role for municipalities to provide diversion programs for designated materials. Instead, municipalities will have the opportunity to act as service providers to producers.

The *Resource Recovery and Circular Economy Act* also establishes the Resource Productivity and Recovery Authority (the Authority) to enforce the Act and collect data.

Staff is participating in consultations pertaining to the development of the wind-up plans and regulations directly and through working groups such as the Municipal Resource Recovery and Research Collaborative (Collaborative), which consists of representatives from the Association of Municipalities of Ontario, the Municipal Waste Association, the Regional Public Works Commissioners of Ontario, and the City of Toronto. The Collaborative advocates for a smooth and timely transition to extended producer responsibility, and promotes the interests of all Ontario municipalities. Staff is providing feedback that is consistent with past positions taken by Council.

Work to transition the Used Tires Program and the Blue Box Program has already begun and is detailed in the following sections.

## 2. Used Tires Program

Currently, Peel and other municipalities collect used tires from residents and are paid a collector fee by Ontario Tire Stewardship.

In February 2017, the Minister sent a letter to Ontario Tire Stewardship identifying the Used Tires Program as the first program to transition to full producer responsibility under the new Act and directing Ontario Tire Stewardship to develop and submit a wind-up plan to the Authority by November 30, 2017. The Authority is expected to approve the plan by March 31, 2018. The Used Tires Program will cease operations on December 31, 2018.

The Minister also requested Ontario Tire Stewardship to consult with stakeholders and provide opportunities for meaningful engagement in the development of the wind-up plan.

Staff participated in consultations on the development of the wind-up plan and raised the following concerns:

- The lack of opportunity for municipalities to be consulted and adequately review the wind-up plan
- The absence of a complete and actionable wind-up plan
- Insufficient details provided on the risks and implications associated with each proposed option to terminate incentive payments and address processing capacity issues

- Further consideration is required to address legacy tire stockpiles, and
- The financial implications ignore the outstanding collection allowances payable to municipalities.

It is anticipated that further consultation will occur when the Authority releases the proposed wind-up plan for stakeholder review prior to approval in March 2018.

Concurrently with the above wind-up efforts, the Ministry of the Environment and Climate Change is developing a regulation for the new Used Tires Program which will begin on January 1, 2019. It is expected that the Minister will release the proposed new Used Tires Regulation for public review and comment in November 2017.

Staff will review and provide comments on the proposed regulation and wind-up plan when they are released. Due to the timing of the consultation period, Council approval of staff comments may not be possible prior to submission. In this case, staff comments will be presented to Council at the earliest opportunity and any additional comments made by Council will be submitted.

## 3. Blue Box Program

The Blue Box Program is currently in a shared responsibility program, with municipalities and producers each paying approximately 50 percent of the net cost of the program.

The Province's Strategy for a Waste-Free Ontario: Building the Circular Economy anticipated that the Blue Box Program will be fully transitioned by 2023, however an earlier transition would significantly reduce or eliminate the municipal costs for the program. Peel's program costs could be reduced by approximately $10-14 million per year, and the Association of Municipalities of Ontario estimates a cost reduction of $130 million per year across all Ontario municipalities. Peel and other municipalities explored ways to accelerate the transition, including through an amendment to the existing program. Council supported the accelerated transition of the Blue Box Program to full producer responsibility (Resolution 2017-630).

In July 2017, the Municipal Resource Recovery and Research Collaborative (representing municipalities) and Stewardship Ontario (representing the producers) sent a joint letter to the Minister of the Environment and Climate Change asking that he amend the Blue Box Program to allow for early transition to full producer responsibility.

In August 2017, the Minister responded by directing the Authority and Stewardship Ontario to develop and submit a proposal to amend the existing Blue Box Program by February 15, 2018. The Minister's letter is attached in Appendix I. The Minister outlined his expectations for the amended plan and identified the key issues to be addressed including but not limited to:

- Avoid negatively impacting Ontarians' experience with and access to existing recycling services
- Improve environmental outcomes
- Create a consistent recycling experience for all Ontario residents
- Ensure a fair and open marketplace

- Address the provincial interests listed in the *Resource Recovery and Circular Economy Act*
- Include a clear transition mechanism to transfer the obligation for the collection and processing of paper products and packaging to Stewardship Ontario upon the expiry or early termination of municipal contracts with their service providers, or potentially through a suitable amendment of those contracts with their service providers
- Municipal governments to have the choice to act as collectors on behalf of Stewardship Ontario, and to have the opportunity to participate in processing
- Consideration be given to accommodating municipally collected paper products and packaging from non-residential sectors (e.g. public spaces, parks, business improvement areas)

The Minister asked Stewardship Ontario to engage in meaningful consultation with municipalities and other stakeholders in the development of the proposal.

In October 2017, Stewardship Ontario began stakeholder consultation sessions with municipalities, and consultations will continue throughout November. Staff is actively participating in consultations and raised the following concerns with the materials presented so far:

- There is insufficient time allotted for municipalities to adequately review, discuss, and provide meaningful feedback on the draft amended Blue Box Program
- Further details are required to properly evaluate the impact of each proposed component for Peel, particularly the transition process
- Additional consideration is required to include non-residential sectors such as business improvement areas, schools, and public spaces currently receiving municipal Blue Box collection services so as to not affect residents' experience with and access to Blue Box services
- There is insufficient definition and detail on key performance standards (e.g. maximum contamination rates), as well as contract terms and conditions, and
- There are no mechanisms for enforcement or for avoiding stranded assets.

The development of the amended Blue Box Program is occurring at a fast pace. Stewardship Ontario has indicated it will consider feedback received in October and November and release the draft amended Blue Box Program for stakeholder review on December 22, 2017. Stakeholder feedback on the draft will be required by January 15, 2018. Providing meaningful feedback in this timeframe will be a challenge but staff is working collaboratively with other municipalities and municipal associations to provide feedback and ensure Peel's interests are represented.

Stewardship Ontario has also indicated it will submit the final draft of the amended Blue Box Program to the Authority in late January 2018 for approval. If municipal comments have not been adequately addressed by Stewardship Ontario in its final draft, municipalities, including Peel, can submit comments to the Authority indicating where we believe the plan falls short. The Authority will review the draft to ensure it is consistent with the Minister's letter and, if it is, will submit the proposal for an amended Blue Box Program to the Minister for approval by February 15, 2018. It is expected that the Minister will release the proposed amended Blue Box Program for public review and comment in late February 2018.

Staff will review and provide comments on the proposed amended Blue Box Program as it works its way through the system. Due to the timing of the consultation period, Council approval of staff comments may not be possible prior to submission. In this case, staff comments will be presented to Council at the earliest opportunity and any additional comments made by Council will be submitted.

## FINANCIAL IMPLICATIONS

When the Blue Box Program transitions to full producer responsibility, Peel could realize in the order of $10 million per year in savings. These potential savings are referenced in the report from the Commissioner of Public Works titled "Roadmap to a Circular Economy in the Region of Peel" and listed on the November 30, 2017, Waste Management Strategic Advisory Committee agenda. Staff recommends that any savings from the transition of the Blue Box program to full producer responsibility be reinvested in resource recovery initiatives identified in the Roadmap.

## CONCLUSION

The transition of the Blue Box Program is occurring earlier than proposed by the province, at the request of municipalities and producers, and the transition of the Used Tires Program to extended producer responsibility is underway.

Staff will continue to actively participate in consultations to provide feedback that is in the interest of the Region's residents and consistent with past Council direction. Regular updates will be bought to the Waste Management Strategic Advisory Committee and Regional Council.

Janette Smith, Commissioner of Public Works

**Approved for Submission:**

D. Szwarc, Chief Administrative Officer

## APPENDICES

Appendix I – Minister's Letter on August 14 2017 to Resource Productivity and Recovery Authority and Stewardship Ontario regarding Blue Box Program

*For further information regarding this report, please contact Norm Lee, Director Waste Management, extension 4703, norman.lee@peelregion.ca.*

*Reviewed in the workflow by:*
Financial Support Unit

Ministry of the Environment and Climate Change

Office of the Minister

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Ontario

August 14, 2017

Ms. Glenda Gies
Chair
Resource Productivity and Recovery Authority
4711 Yonge Street, Suite 408
Toronto ON M2N 6K8

And

Mr. John Coyne
Chair
Stewardship Ontario
1 St. Clair Ave. West, 7th Floor
Toronto ON M4V 1K6

**Re: First Phase Transition – Direction for Proposal for an Amended Blue Box Program Plan**

Dear Ms. Gies and Mr. Coyne:

Ontario's Blue Box Program is well-recognized as a North American leader that provides services for residential paper products and packaging (PPP).

Pursuant to Section 13 of the *Waste Diversion Transition Act, 2016* (WDTA), I am writing to direct the Resource Productivity and Recovery Authority (the Authority) and Stewardship Ontario (SO) to develop a proposal for an amended Blue Box Program Plan (BBPP). This proposal is to be developed collaboratively with municipalities, stewards and affected stakeholders as required by subsection 13(2) of the WDTA.

My expectation is that this proposal will outline the first phase of transition for the Blue Box Program under the WDTA, and will set the stage for a second phase of transition that will result in individual producer responsibility under the *Resource Recovery and Circular Economy Act, 2016* (RRCEA).

It is also my expectation that the proposal for an amended BBPP will build on the accord outlined in the joint letter sent to my predecessor, Glen Murray, on July 7, 2017 from the Association of Municipalities of Ontario, City of Toronto, Regional Public Works Commissioners of Ontario, Municipal Waste Association and SO.

...2

It is in the public interest that the proposal for an amended BBPP is consistent with the following principles:

- Ensuring a seamless transition of the Blue Box Program, specifically:
  - Not negatively affecting Ontarians' experience with and access to Blue Box services,
  - Incorporating clear rules to support residents' participation including standardized materials and services, and
  - Improving program performance;

- Working towards the circular economy by supporting reduction, reuse, recycling and reintegration of PPP materials into the economy;

- Providing for continuous improvement of environmental outcomes by:
  - Expanding and harmonizing the list of materials in the existing Blue Box program that are accepted from Ontario residents,
  - Establishing clear and measurable collection and management standards with a high level of environmental protection, and
  - Developing methods to support waste reduction;

- Providing effective economic methods to incent behavior changes leading to waste reduction of PPP;

- Driving innovation through collaborative and competitive efforts by:
  - Supporting cooperation among parties, including stewards, municipalities, waste management industry, and other affected parties, to bring complementary abilities to deliver better results, and
  - Promoting competition by ensuring a fair and open marketplace for Blue Box services under the WDTA and not creating barriers to competition when the program transitions to individual producer responsibility under the RRCEA;

- Avoiding stranded assets to the extent possible in a collaborative manner;

- Providing choices for municipalities where SO is to provide Blue Box services (i.e. transitioned municipalities):
  - These municipalities will decide whether they wish to act on behalf of SO for the procurement and contract oversight of PPP collection services, and
  - These municipalities should also have an opportunity to participate in the post-collection management of PPP collected; and,

- Addressing issues related to the in-kind contribution from the newspaper industry in a manner that is without cost to the transitioned municipalities.

...3

The Authority and SO shall have regard to the provincial interest described in Section 2 of the RRCEA when developing the proposal for an amended plan.

As producers assume the 50 per cent of costs currently borne by municipal taxpayers, it is my expectation there will be a clear and transparent process by which municipalities demonstrate the benefit their taxpayers will receive.

The Authority and SO shall develop a communication and issues management plan. The plan shall identify issues that may arise during the development of the proposal for the amended BBPP, outline the steps to manage these potential issues and set out the process by which the Authority and SO will provide information to affected stakeholders and the public on a regular basis.

During the development of the proposal for an amended plan, the Authority and SO shall ensure meaningful consultation and communication with representatives of municipalities, stewards and other affected stakeholders.

Together with the submission of the proposal for an amended BBPP, the Authority and SO shall submit a report to the Ministry outlining how the Authority and SO have met the consultation requirements under the WDTA, including:

- A list of the stewards, municipalities, service providers and other affected stakeholders that were consulted during the development of the proposal;
- A summary of the comments received by the Authority and SO from affected stakeholders; and,
- A report of how the comments were considered by the Authority and SO.

The Authority and SO shall report to the Ministry each month on their progress in developing the proposal for an amended BBPP.

An addendum to this letter has been attached which provides additional direction for amending the BBPP.

The proposal for an amended BBPP shall be developed in accordance with this letter and the enclosed addendum and the WDTA.

If approved by the Authority, the proposal for an amended BBPP shall be submitted to me for approval by February 15, 2018, or on such later date that I provide in writing. The submission shall include particulars of any matters that are unresolved at the time of the submission.

It is my expectation that, upon my approval, and subject to any necessary amendments to relevant regulations being approved by the Lieutenant Governor in Council, this amended plan will replace the current plan in its entirety.

...4

If it is in the public interest to do so, I will provide further direction at a later date related to the matters set out in this requirement, or to provide clarification related to amending the BBPP.

Sincerely,

Chris Ballard
Minister

Cc: Paul Evans, Deputy Minister
Ministry of the Environment and Climate Change

## ADDENDUM TO THE MINISTER'S DIRECTION LETTER FOR AN AMENDED BLUE BOX PROGRAM PLAN

Pursuant to an agreement being reached between SO and each transitioned municipality (see definition below) and subject to necessary amendments to relevant regulations being made by the Lieutenant Governor in Council, SO would provide services for residential paper products and packaging (PPP) supplied by stewards to Ontario residents and covered under the Blue Box Program.

### NON-TRANSITIONED MUNICIPALITIES:

Non-transitioned municipalities are those that have not entered into an agreement with SO and SO is not delivering Blue Box collection and management services for these municipalities.

The proposal for an amended BBPP shall address payments to the non-transitioned municipalities under Section 11 of the WDTA based on the municipality's verified net cost of operating its existing Blue Box program:

- The plan shall define the eligible costs to be included in calculating the net cost; and,
- The plan shall also describe any agreements among the Authority, SO, and recipient municipalities for the reporting and verification of costs by municipalities.

### TRANSITIONED MUNICIPALITIES:

Subject to necessary amendments to relevant regulations being approved by the Lieutenant Governor in Council, transitioned municipalities are those that have entered into an agreement with SO and SO is delivering Blue Box collection and management services.

The proposal shall outline when and how the responsibility for the collection and management of PPP will be transferred smoothly from these municipalities to SO.

The proposal for an amended BBPP shall include the following:

***Defined Materials Covered in BBPP:***

- Include an expanded definition of Blue Box materials to identify the PPP that will be covered under the BBPP;
- The materials shall include:
    - paper products,
    - primary packaging,
    - convenience packaging, and
    - transport packaging;
- For purposes of primary, convenience and transport packaging, refer to the RRCEA for definitions; and,

- When defining the materials, SO and the Authority will also consult with stewards of packaging who are regulated under deposit-return programs (e.g., stewards of milk containers).

***Defined Stewards:***

- Define obligated stewards.

***Defined Responsibility for Waste Reduction and Resource Recovery:***

*Waste Reduction*

The proposal for an amended BBPP shall:

- Establish methods to facilitate the reduction of waste generated related to defined PPP materials. The methods may include activities to support:
    - increase of the product's or packaging's reusability and recyclability,
    - reduction or elimination of any impact the material may have on the recyclability of other materials,
    - reduction of the amount of waste generated at the end of the product's or packaging's life,
    - reduction or elimination of the use of any substance in the material that compromises the material's reusability or recyclability, and/or
    - increase of the use of recovered resources in the making of the material;
- Use means to discourage the use of materials that are difficult to recycle and have low recovery rates. The means include, but are not limited to, rules for stewards, fee setting methodology, and compiling information to measure stewards' initiatives to reduce waste; and,
- Establish mechanisms to identify and address issues associated with problematic materials, such as packaging that is difficult to recycle.

*Collection and Management of Materials*

The proposal shall set clear standards for SO's collection and management, including:

- Support clear service standards to enable resident participation;
- Increase the diversion target for the Blue Box Program to 75 per cent of the PPP supplied by stewards to transitioned municipalities' households;
- Establish material-specific management targets for PPP supplied by stewards to transitioned municipalities' households;
- Identify geographically-based collection and management standards, including rural, northern, and remote areas;
- Maintain convenience and accessibility standards, including:
    - curbside collection for households where currently provided by these municipalities and indigenous communities,
    - collection services to multi-residential buildings where currently provided by these municipalities and indigenous communities, and
    - depot collection services currently provided by these municipalities and indigenous communities;
- Improve convenience and accessibility by offering collection services to multi-residential buildings that are not being serviced by these municipalities, within an identified timeframe;

- Consider accommodating associated public spaces, parks and other related services provided by these municipalities;
- Consider expanding Blue Box collection services over time; and,
- The methods for managing the materials shall allow for the material or part of the material to be, in accordance with Ontario standards and regulations:
    - reused,
    - used in the making of new products, packaging or other activities in end-markets, or
    - used as a nutrient for improving the quality of soil, agriculture or landscaping.

*Promotion and Education*

For the purpose of increasing resource recovery and reducing Blue Box waste materials, the proposal shall establish an effective promotion and education program, including promoting awareness of the program activities to residents and other targeted audiences and engaging audiences to elicit feedback.

*Registration, Reporting, Record Keeping and Auditing*

The proposal will include an appropriate approach for registration, reporting, record keeping and a third-party audit to ensure an effective and efficient system.

**ESTABLISH ISSUE MANAGEMENT APPROACHES:**

The proposal shall:

- Develop a protocol for managing issues raised in a fair, effective, efficient and equitable manner during the implementation of the amended plan, if approved;
- Develop a plan to avoid stranded assets to the extent possible in a collaborative manner; and,
- Establish an arrangement between SO and the newspaper industry (i.e., the Canadian Newspapers Association and Ontario Community Newspapers Association) in order to meet members' obligation for old newsprint in such a manner that is without cost to transitioned municipalities.

**PROMOTE COMPETITION:**

The proposal shall:

- Establish a mechanism to support a fair and open marketplace for Blue Box services under the WDTA;
- Not create barriers to competition in the second phase of transition that will result in individual producer responsibility under the RRCEA; and,
- Describe how contracts held by SO for the collection and management of PPP will be managed upon wind up of the Blue Box Program to enable competition once materials are regulated under the RRCEA.

## PERFORMANCE INDICATORS AND REPORTING:

- The proposal shall include performance indicators to measure whether SO has fulfilled the resource recovery obligations and established waste reduction methods as set out in the amended plan; and,
- In addition to the requirements set out in Section 30 of the WDTA, SO's Annual Report shall include:
    - a description of whether and how SO has fulfilled resource recovery obligations set in the amended plan,
    - a description of how SO has supported waste reduction methods set in the amended plan, and
    - a third-party audit of SO's collection and management services and outcomes.

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# REPORT
# Meeting Date: 2017-11-30
# Waste Management Strategic Advisory Committee

## For Information

DATE: November 23, 2017

REPORT TITLE: **UPDATE ON THE PROVINCE FOOD AND ORGANIC WASTE FRAMEWORK**

FROM: Janette Smith, Commissioner of Public Works

## OBJECTIVE

To update Council on the status and expected next steps of the province's Food and Organic Waste Framework.

**REPORT HIGHLIGHTS**

- The *Waste-Free Ontario Act, 2016* was proclaimed in November 2016, and the accompanying Strategy for a Waste-Free Ontario was adopted in February 2017.
- The Strategy requires the development and implementation of a Food and Organic Waste Framework to reduce the generation and disposal of food and organic waste.
- The Framework will include a policy statement, which will provide direction to key stakeholders, including municipalities, and an action plan, which will set out actions the province will take. The Framework was posted for 60 days for comments in November 2017 and will be finalized in early 2018.
- The Region of Peel and other municipalities are collaborating to advocate on behalf of municipal interests.

## DISCUSSION

### 1. Background

In November 2016, the *Waste-Free Ontario Act, 2016* was proclaimed and the "Strategy for a Waste-Free Ontario: Building the Circular Economy" (the Strategy) was adopted in February 2017. The Strategy requires the development and implementation of a Framework to address food and organic waste in Ontario.

In February 2017, staff submitted Council-approved comments on the Strategy, supporting the development of the province's Food and Organic Waste Framework (Resolution 2017-82).

### 2. Food and Organic Waste Framework

The Ministry of the Environment and Climate Change (the Ministry) is in the process of developing the Food and Organic Waste Framework (the Framework).

The Ministry established a multi-stakeholder working group, which includes staff from Peel, to help guide the development of the Framework.

Staff provided input and feedback consistent with past Council positions. Staff raised the following key issues to be addressed in the development of the Framework:

- Streamline the approvals process for new or expanded organics processing facilities
- Recognition of municipal differences (e.g. size, resources)
- Consideration of new approaches and technologies such as mixed waste processing
- Supporting end-markets for products (e.g. compost, fertilizer, renewable natural gas, etc.) derived from organic waste, and
- Update regulations to require the diversion of food and organic waste from the Industrial, Commercial and Institutional sector, including from multi-residential buildings.

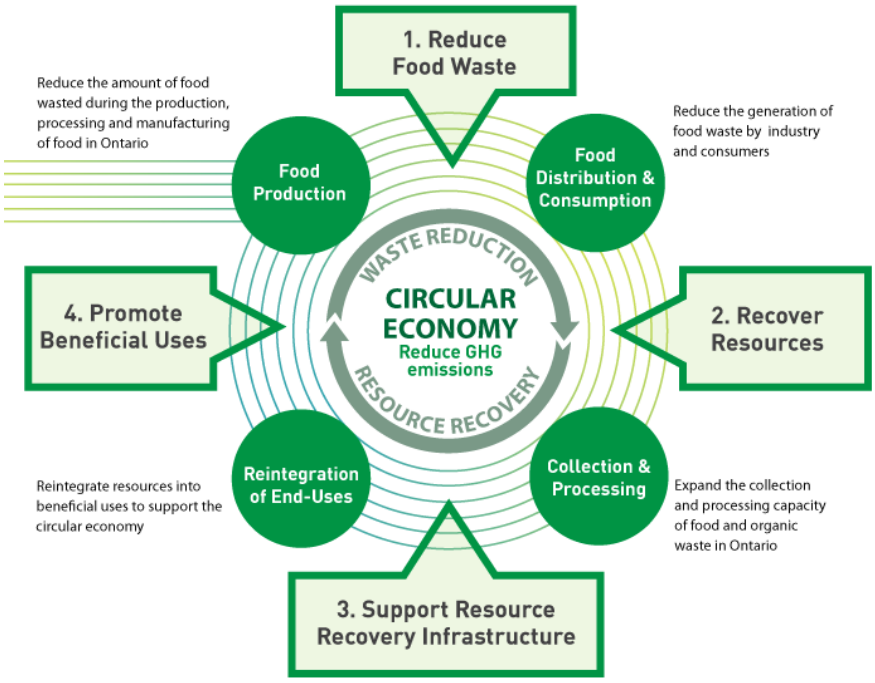
On November 16, 2017 the proposed Framework was posted for a 60-day comment period.

The proposed Framework includes:

- An action plan that outlines provincial initiatives to support the reduction of food and organic waste, and
- A policy statement that provides direction to government and non-government stakeholders on food and organic waste

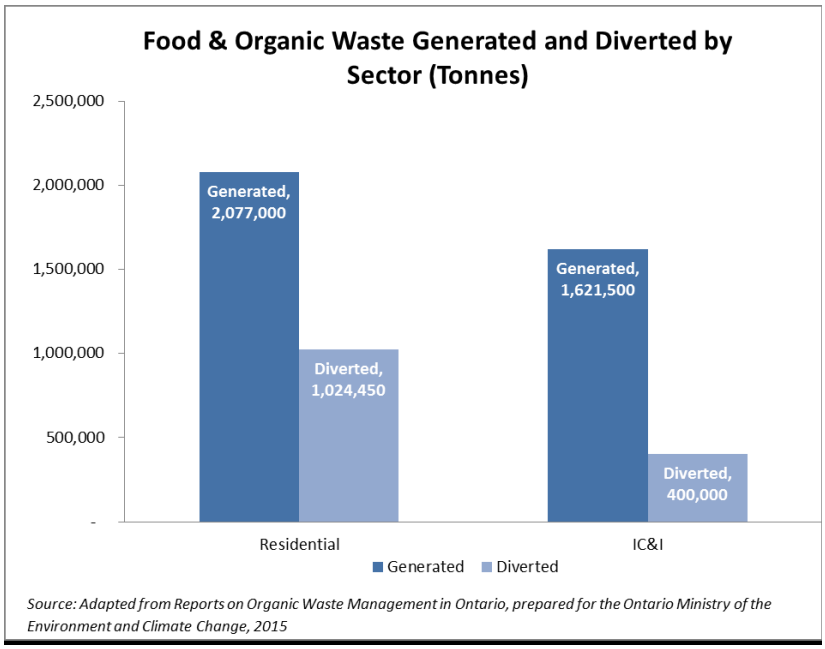
The proposed Framework introduces the vision of a circular economy that moves towards zero food and organic waste and zero greenhouse gas emissions from the waste sector, as shown in the following figure from the proposed Framework.

Figure 1: Vision for a circular economy



The 2015 generation and diversion of food and organic waste in Ontario is shown in the following figure from the proposed Framework.

Figure 2 – Food and Organic Waste Generated and Diverted by Sector

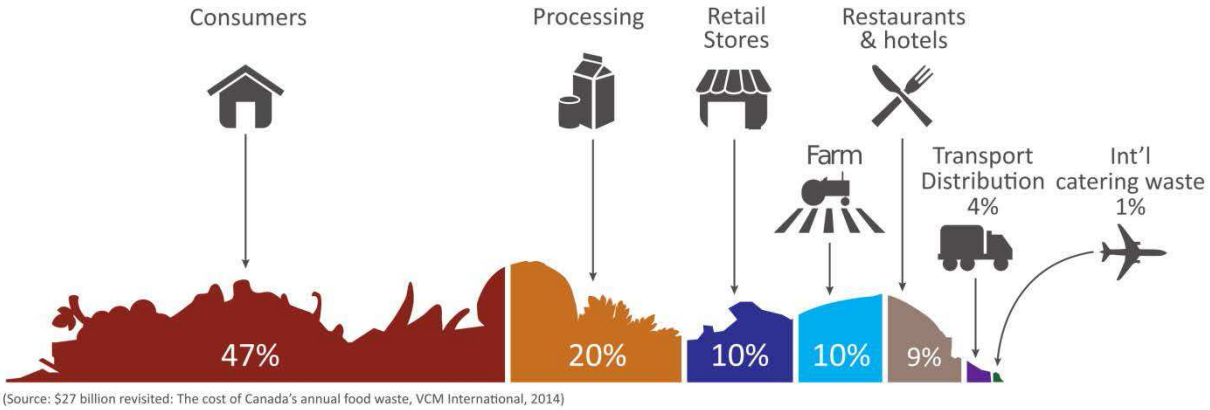



The proposed Framework introduces an Ontario Food Recovery Hierarchy to prioritize the best use of food resources in Ontario. The hierarchy consists of the following:

1. Reduce: prevent and reduce food and organic waste at the source
2. Feed People: safely rescue and redirect surplus food before it becomes waste
3. Resource Recovery: recover food and organic waste for a beneficial use

The first two components of the hierarchy are focused on preventing the generation of food waste along the supply chain. The value of food waste across the supply chain is illustrated in the following figure.

Figure 3: Value of Food Wasted by Sector in Canada




Four key objectives of the proposed Framework are:

- To reduce the generation of food waste along the entire food supply chain
- To recover resources from food and organic waste, in particular, the multi-residential and Industrial, Commercial and Institutional sector
- To promote end uses of products derived from organic waste
- To support the development of organics processing infrastructure

Of particular importance to Peel (and other municipalities) is the inclusion of aggressive diversion targets followed by a disposal ban for organic waste.

The proposed Framework supports the development of anaerobic digestion facilities to process source-separated organic waste and the development of mixed waste processing to recover additional organics from garbage.

The proposed Framework also includes, among other things, provisions related to:

- Promotion and education
- Land use planning, and
- Green procurement.

The aggressive diversion targets, support for new infrastructure, and other provisions of the Framework support the achievement of Council's 75% 3R's diversion target and are generally consistent with positions previously taken by Regional Council.

## FINANCIAL IMPLICATIONS

The progressive diversion targets and ultimate disposal ban for organic waste will be significant drivers of mixed waste processing in Peel.

## CONCLUSION

Staff will continue to participate in consultations along with other municipalities and municipal organizations to provide feedback that advocates for the interest of the Region's residents and is consistent with past Council direction.

Staff will submit comments on the proposed Framework within the 60-day comment period. If timing does not allow for Council approval of Peel's comments, staff will submit comments within the 60-day comment period with the proviso that they are subject to Council approval and any comments made by Council will be submitted to the Ministry.

Janette Smith, Commissioner of Public Works

**Approved for Submission:**

D. Szwarc, Chief Administrative Officer

*For further information regarding this report, please contact Norman Lee, Director Waste Management, extension 4703, norman.lee@peelregion.ca.*

*Reviewed in the workflow:*

Financial Support Unit

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# REPORT
# Meeting Date: 2017-11-30
# Waste Management Strategic Advisory Committee

DATE: November 19, 2017

REPORT TITLE: **STRATEGIC TERMS FOR THE ANAEROBIC DIGESTION FACILITY PROJECT**

FROM: Janette Smith, Commissioner of Public Works

## RECOMMENDATION

**That the strategic terms for the Anaerobic Digestion Facility Project, as described in the report of the Commissioner of Public Works, titled "Strategic Terms for the Anaerobic Digestion Facility Project," be endorsed;**

**And further, that $6 million be transferred from Capital Project 15-6320 to Capital Project 17-6305 for the construction of a transfer station at the Anaerobic Digestion Facility site;**

**And further, that the remaining funds in Capital Project 15-6320 be used for the construction of a yard waste transfer station at the Fewster Community Recycling Centre.**

## REPORT HIGHLIGHTS

- A property located at 7500 Danbro Crescent, Mississauga (the Site) was acquired in September 2017 for the Anaerobic Digestion Facility (AD Facility).
- The capacity of the AD Facility will be 90,000 tonnes per year, which will meet the Region of Peel's needs for the foreseeable future. Additional capacity may be required in the future but cannot be accurately forecasted at this time. No dedicated capacity will be provided for Industrial, Commercial and Institutional organics.
- A transfer station will be co-located with the AD Facility at the Site. Space is available for a transfer station. Access to a transfer station in west Mississauga will make waste collection more efficient and will eliminate the need for a dedicated yard waste transfer station.
- The AD Facility and transfer station will be developed by a design, build, operate and maintain (DBOM) contract approach. The Project Company will operate the entire Site and will be responsible for the management of all outputs, except renewable natural gas. The Project Company will competitively procure the sub-contract for digestate management.
- Biogas produced by the AD Facility will be refined to renewable natural gas for injection into the Enbridge Gas Distribution Limited (Enbridge) natural gas distribution system. The Region will retain ownership of the renewable natural gas and will direct where renewable natural gas is to be used at its discretion.
- Staff will negotiate with Enbridge the terms of the renewable natural gas injection

service agreement concurrent with the procurement of the DBOM contract for the AD Facility and transfer station, and will report back to Regional Council for approval of an agreement with Enbridge once key terms have been negotiated.
- Subject to Regional Council approval of the recommendation, procurement of the DBOM contract for the AD Facility and transfer station will commence in January 2018 and will include Request for Prequalification and Request for Proposal stages. Staff will report back to Regional Council with a recommended contract award.
- During the procurement process, the Purchasing Advisor will be designated as the single point of contact for all interests related to the procurement process.

## DISCUSSION

### 1. Background

In 2014, Regional Council endorsed the Waste Management Infrastructure Development Plan which included a new Anaerobic Digestion Facility. In 2015, Regional Council approved a plan to develop a 120,000 tonne per year Anaerobic Digestion Facility (AD Facility) to be located in either the City of Brampton or the City of Mississauga where direct delivery of organics can be achieved (Resolution 2015-742).

### 2. Site Update

The project Site, located at 7500 Danbro Crescent[1] (the Site), in northwest Mississauga was acquired on September 15, 2017.

Regional staff and consultants have completed a full range of due diligence investigations prior to closing, including permitting, Site conditions and impacts of the AD Facility and transfer station on neighbouring properties. The Site can be adequately serviced, including water, wastewater and natural gas.

The City of Mississauga has confirmed that the Region's intended use of the property is a permitted use under the existing zoning designation, and that the property is exempt from the City's site plan control by-law. The Site is also located outside of the Toronto Pearson International Airport Primary Bird Hazard Zone and has no conservation authority regulated area.

The Ministry of the Environment and Climate Change (the Ministry) has confirmed that the environmental permits required to build and operate the AD Facility and transfer station can be issued if it can be shown that the odour and noise emissions will not impact the closest sensitive receptors, i.e. that the expected impacts at the sensitive receptors will be below the Ministry's limits. Existing land uses and development proposals in the vicinity of the Site were surveyed and the closest sensitive receptors were identified. The Region's consultant modeled expected odour and noise emissions and report that the AD Facility and transfer station will not impact the sensitive receptors.

Investigations of existing Site conditions (referred to as Phase 1 and Phase 2 Environmental Site Assessments) did not discover any contamination of subsoils or groundwater at the Site.

[1] Site is comprised of four parcels: 7450-7500 Danbro Crescent and 7360-7390 East Danbro Crescent

The Site has been the location of a secure tractor-trailer storage facility since 2008. According to the previous owner, the current use generates approximately 200 tractor-trailer movements to and from the Site each weekday. A traffic study completed as part of the due diligence investigations did not identify any significant impacts as a result of the AD Facility and transfer station replacing the current use.

Following closing, the previous owner will continue to operate the secure trailer storage facility on the Site as a tenant of the Region for a period of 14 months (extendable on market terms upon mutual agreement). During this period, Regional staff will initiate the process to procure a contract to design, build and operate the AD Facility and transfer station and will also initiate the process to secure environmental permits. Consultation with owners and occupants of nearby properties is a requirement of the permitting process. If procurement and permitting proceed according to plan, construction at the Site would commence in 2020.

## 3. Strategic Terms for the Anaerobic Digestion Facility Project

The AD Facility will receive and process green bin organics to produce biogas, digestate, wastewater and residue. Biogas is a renewable energy source that can be beneficially used in different ways, as described in section 3d), including being upgraded to renewable natural gas. Digestate contains organic matter and plant nutrients and can be used as a fertilizer or to produce compost. Wastewater will be discharged to the sanitary sewer in accordance with the Region sewer use policies. Residue will be disposed.

Strategic terms define the roles and responsibilities of the parties and the performance requirements of the project, including the requirements for the management of outputs.

The following sections outline strategic terms for the project, in relation to:

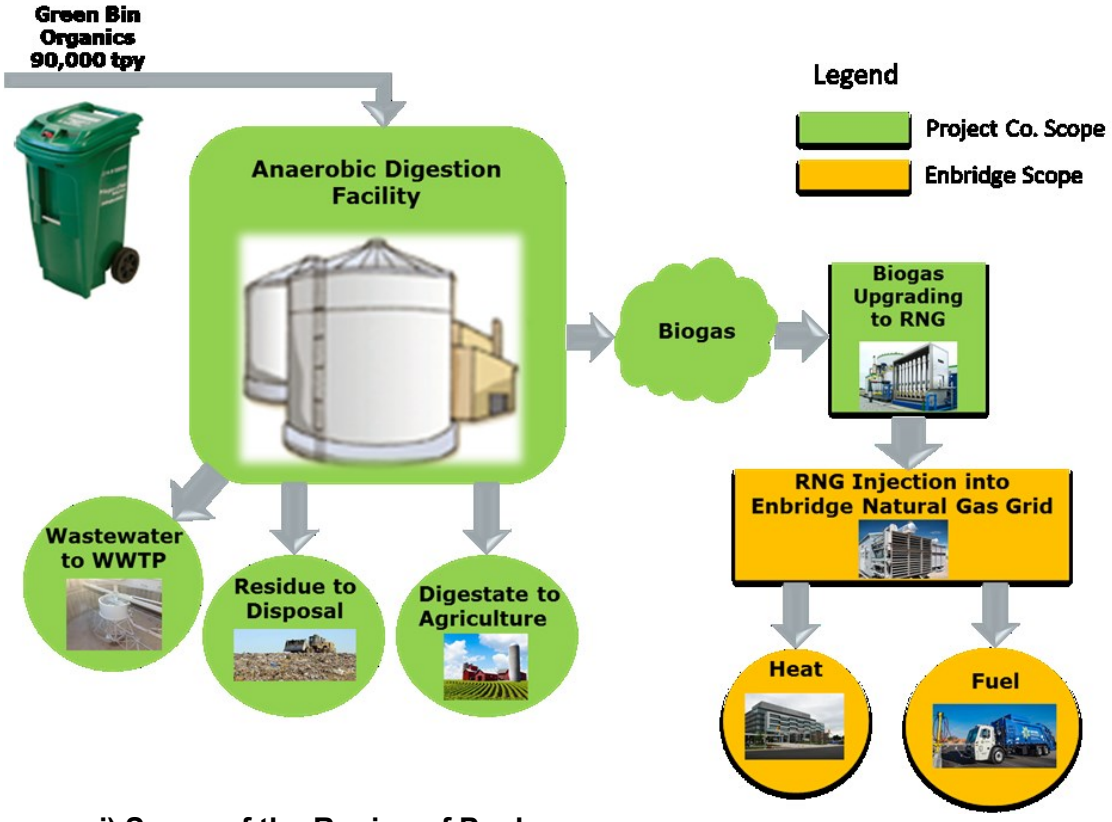
- project scope
- capacity and feedstock
- biogas management and utilization
- digestate management and utilization
- procurement, and
- community engagement

### a) Project Scope

The project will be developed using a design, build, operate and maintain (DBOM) approach. The three major parties involved in the project will be the Region of Peel, the successful proponent from the procurement process (herein referred to as “Project Co.”) and Enbridge Gas Distribution Limited (Enbridge). Project Co. and Enbridge will be contracted to the Region of Peel.

The roles of the three major parties in delivering the AD Facility project scope is illustrated in the figure below and explained in the following sections.

Figure: Roles in Delivering the AD Facility Project Scope




**i) Scope of the Region of Peel**

The Region of Peel will be responsible for:

- providing the Site for the AD Facility, transfer station and related structures
- leasing a portion of the Site to Enbridge for the renewable natural gas injection system
- supplying a minimum guaranteed tonnage of organics
- retaining ownership of the renewable natural gas and determining how it is to be used at the Region's sole discretion, and
- paying Project Co. and Enbridge based on the agreed-upon payment terms and conditions.

**ii) Scope of the Project Company**

Project Co. will be responsible for:

- design, approvals and construction
- operations for a period of 15 years plus an optional 5-year extension (at the Region of Peel's sole discretion)
- maintenance, including lifecycle maintenance
- upgrading biogas to renewable natural gas;
- management of outputs including digestate, wastewater and residue, but excluding renewable natural gas, and
- environmental compliance.

Making Project Co. responsible for operation of entire Site, including transfer station and weigh scales, will achieve the following business objectives:

- clear accountability for operations
- integration of design and operations, and
- clear responsibility for environmental compliance.

Project Co. will be required to meet the following performance requirements:

- process all Region supplied organics up to 90,000 tonnes per year
- minimize on-site time for collection vehicles to maintain the efficiency of collections and prevent collection vehicles from queuing on Danbro Crescent
- produce biogas at a rate and of a quality that meets or exceeds the minimum requirement
- convert biogas to renewable natural gas meeting renewable natural gas quality specifications and at a recovery rate that meets or exceeds the minimum requirement
- limit residue generation below maximum quantity and water content limits
- produce digestate meeting or exceeding minimum quality requirements, except heavy metals, and at a rate not exceeding a maximum quantity
- wastewater discharge to sanitary sewer to comply maximum discharge limits per surcharge agreement, and
- contain, control and treat odours and maintain odour emissions to below maximum limits.

**iii) Proposed Scope of Enbridge Gas Distribution Limited**

It is proposed that Enbridge will be responsible for:

- design, construction, operation and maintenance of an Enbridge-owned compression and injection station at the Site, and
- injection of the Region's renewable natural gas in to the pipeline and distribution to Regional facilities or other uses as determined by the Region.

**b) AD Facility Capacity**

Staff have prepared organic tonnage projections and recommend an AD Facility having a capacity of 90,000 tonnes per year. Additional capacity may be required at some future time, but how much and when cannot be predicted with certainty. The implementation of the Food and Organic Waste Framework under the *Waste-Free Ontario Act, 2016*, which will include a focus on reduction, will change how organic waste is generated and managed in the future.

Additional organics processing capacity will be considered as part of the updated Waste Management Infrastructure Plan, possibly as a component of a Mixed Waste Processing Facility.

The Site is large enough to accommodate an ancillary use. Its location creates an opportunity to increase the efficiency of waste collections on the west side of the Region

by co-locating a transfer station with the AD Facility. Co-locating a transfer station at the Site will eliminate the need for the dedicated Yard Waste transfer station included in the current infrastructure plan for Waste Management. Staff recommends therefore, that a transfer station be co-located with the AD Facility at the Site.

**c) Capacity for Industrial, Commercial and Institutional Organics**

Staff commissioned Partners in Project Green to complete a study of the sources, quantities and types of organic waste material generated by Industrial, Commercial and Institutional establishments in food production, distribution and retail sectors within Peel Region. This study compiled information on the types of establishments and the types and quantities of organic waste generated. The study also assessed the state of the market for organic waste management services available to the Industrial, Commercial and Institutional sector, now and in the future. The study also investigated management practices and market conditions for disposal and diversion options.

Findings from the study indicate that:

- price is the dominant factor for waste management in the Industrial, Commercial and Institutional sector; the price to manage waste, including diversion of organic waste must be competitive with landfill
- Industrial, Commercial and Institutional companies usually enlist an all-in waste management solution and typically contract with waste haulers (and not directly with processors) for terms of less than one to three years, and
- for multi-national companies, social responsibility decisions are made elsewhere.

On the basis of this information, staff concluded that a reliable supply of suitable Industrial, Commercial and Institutional organic waste cannot be secured at this time, or in the future, at a price and on terms compatible with processing at the Region's AD Facility. Staff recommends therefore, that additional capacity for Industrial, Commercial and Institutional organic waste not be included in the design of the AD Facility.

**d) Management of Biogas**

Biogas is one of the products on the anaerobic digestion process. Comprised primarily of methane and carbon dioxide, it is a renewable energy source that can be beneficially used in different ways including:

- direct combustion for industrial/commercial building and/or process heat
- cogeneration to produce electricity and heat for on-site and off-site use, and
- upgrading biogas to renewable natural gas for injection into the local natural gas distribution system.

Direct combustion of biogas requires an industrial facility with a large, constant heat demand in close proximity to the AD Facility and, to date, none have been identified. Direct combustion is therefore not an option at this time. A portion of the biogas can be used directly within the AD Facility to meet process and building heating requirements.

The Independent Electricity System Operator (the provincial organization with the mandate to purchase electricity for the Ontario system) had a procurement program for

electricity generated from renewable energy sources, including biogas, but that program was cancelled on September 27, 2016. At present there is no program to procure renewable electricity from large generators. In late October the province released the Long-Term Energy Plan 2017 which confirms that no large-scale procurement of new renewable electricity generation capacity is planned. Therefore, electricity generation is not an option at this time.

Upgrading biogas to renewable natural gas for injection into the natural gas distribution system is currently the only viable beneficial biogas utilization option for the AD Facility. Prior to injection into the natural gas distribution system, biogas must first be upgraded to renewable natural gas, then compressed and injected into the pipeline. Once in the pipeline the renewable natural gas can be available for use anywhere within the North American gas distribution system.

The Long-Term Energy Plan 2017 states that the province will work with industry partners and the Ontario Energy Board to introduce a requirement that natural gas contains some renewable content.

The steps that are involved in upgrading biogas to renewable natural gas are described in Appendix I but generally involve the removal of carbon dioxide and trace gasses to produce a gas that is comprised primarily of methane.

The Region of Peel and Enbridge Gas Distribution Limited (Enbridge) have been exploring options to purify the biogas generated from the AD Facility to produce renewable natural gas and inject the renewable natural gas to Enbridge's natural gas distribution system. Enbridge is the regulated natural gas distribution utility in south central Ontario, including Peel Region.

A Memorandum of Understanding has been executed between both parties and discussions continue towards securing a long-term agreement for the project. The purpose of the Memorandum of Understanding is to clarify roles and responsibilities for the agreements that would govern the design, construction, operation and maintenance of the biogas to renewable natural gas upgrading system and injection of renewable natural gas into the natural gas distribution system.

Enbridge is proposing to offer two services to renewable natural gas producers as follows:

1. Biogas Conditioning and Upgrading Service (Upgrading Service), and
2. Renewable Natural Gas Injection Service (Injection Service).

The biogas upgrading and conditioning process is sensitive to changes in flow and quality of the biogas from the AD Facility. The injection process includes a quality check to ensure that renewable natural gas meets pipeline quality standards, control of flow and pressure through regulation or compression, odourization and delivery into the gas distribution system.

It is recommended that the Region contract with Enbridge only for the Injection Service and that the biogas upgrading to renewable natural gas be included in Project Co.'s scope for the AD Facility for the following reasons:

- integration of design and operations
- simultaneous commissioning of the AD Facility and biogas upgrading system
- clear accountability for performance of the AD Facility and biogas upgrading, and
- contractual simplicity and clarity.

Enbridge would be responsible for:

- design, approvals and construction of the injection station
- operation and maintenance of injection station
- ensure that the renewable natural gas injected into the gas distribution system meets the requirements of applicable codes and standards, and
- delivery of Peel's renewable natural gas to Region of Peel facilities or to market.

Enbridge's role with respect to the biogas upgrading system can be revisited with the Project Co. and/or Enbridge. Contract amendments, if required, will be brought to Regional Council for approval.

The Region will retain ownership of the renewable natural gas and the distribution agreement will require Enbridge to deliver Peel's renewable natural gas to any locations within the Enbridge service area as determined by the Region.

Staff will negotiate the Site specific terms of the Injection Service and will report on the key terms of this agreement to Regional Council for approval upon or following the award of the contract to Project Co. for the AD Facility.

As there is uncertainty surrounding provincial policies and future market options for renewable natural gas are still evolving, a report will be brought to a future meeting of the Waste Management Strategic Advisory Committee or Regional Council with options and recommendations for use of Peel's renewable natural gas. Options for using Peel's renewable natural gas could include (but are not limited to):

- building heat or process heat in Regional facilities
- fuel for Peel vehicles or in Peel waste collection vehicles
- process heat at the AD Facility
- sale to third parties or on the open market.

**e) Management of Digestate**

Digestate is the organic material remaining after the anaerobic digestion process converts some of the organics into biogas. At full capacity, the AD Facility is expected to generate a minimum of approximately 20,000 tonnes per year of digestate. Digestate will be produced as organics are processed at the AD Facility, which will be at a more or less constant rate throughout the year.

The digestate will contain organic matter, plant nutrients and water, which make it suitable for beneficial use as a fertilizer, compost or a soil amendment. Beneficial use of materials similar to digestate is a common and longstanding practice in Ontario and elsewhere. Requirements for the quality and use of fertilizers, composts or soil amendments containing or produced from organic waste materials are well established in provincial and federal policies and regulations.

A typical system for the beneficial utilization of digestate and similar materials in agriculture will include the following key components:

1. access to sufficient area of suitable agricultural land
2. facilities that can receive digestate throughout the year and store the material during the seasonal periods when application to agricultural land is not possible
3. experienced service providers possessing the expertise and equipment necessary to apply the annual production of digestate to agricultural land, and
4. management procedures to ensure compliance with applicable provincial or federal requirements.

A small but experienced industry exists in Ontario providing services for the beneficial use of digestate and similar materials. All of the system requirements listed above are currently being provided by the industry.

The quantity of digestate expected to be produced by the AD Facility will likely mean that key components of the beneficial utilization system will be located outside of Peel Region, including the storage or processing facilities and much of the agricultural land to which the digestate will be applied.

The Region has been marketing compost produced from organics and yard waste for agricultural use for many years. In 2016, the Region marketed approximately 17,000 tonnes of compost, including 13,000 tonnes of compost to agricultural markets located mostly outside of Peel Region. The agricultural demand for the Region's compost has consistently exceeded the supply, suggesting a strong and consistent demand by agriculture for alternative sources of nutrients.

In July and August 2016, staff and AD project consultants consulted with the relevant federal and provincial government agencies, with Ontario agricultural associations, with farmers and farm businesses, and with the beneficial use industry regarding the agricultural utilization of digestate from Peel's AD Facility. Consistent messages from all sectors were:

- the agricultural land base within reasonable proximity to Peel Region is more than adequate for the expected annual tonnage of digestate, considering agricultural practices, farmer interest and current and expected future increases in the availability of similar materials
- many farmers and farm business are aware of and interested in using digestate and similar materials, subject to material quality and price
- registration of the digestate as a fertilizer product was recommended to minimize the administrative requirements for regulatory compliance, and
- the permitting process for establishing new storage or downstream processing facilities will be difficult and lengthy.

A reliable and secure system for beneficially utilizing the digestate in agriculture is critical if the AD Facility is to achieve its waste diversion objectives by 'closing the loop' on organics recycling. Planning for digestate management early in the AD Facility development process is essential to ensure that the digestate will meet the quality requirements for beneficial use and ensure that the components of the digestate management system are in place when the AD Facility becomes operational.

Companies that would develop and operate Peel's AD facility typically would not self-perform the digestate management work but would instead contract with one or more of the small number of active beneficial use service providers. The relatively small size of the beneficial utilization industry could limit the response to the Request for Proposal if it were procured with the AD Facility, as they would only partner with one of the prequalified proponents.

Staff therefore recommend that, following the DBOM contract award, Project Co. be invited to offer to self-perform the digestate management services on competitive terms, including price. If Project Co. declines to offer the service, or offers price and other terms which Staff deem uncompetitive, they would then be required to competitively procure a contract for digestate management services with:

- the scope of work to be approved by Region
- the scope to include primary and contingency capacity
- selection of the contractor include consideration of experience, track record and capabilities
- the procurement to be conducted with Regional oversight and to be consistent with Regional procurement policies
- the term of the digestate management services contract to be the same as that for operation of the AD Facility, and
- the Region retaining final approval on terms and price.

This approach will increase competition for both services resulting in better procurement outcomes for the AD Facility and the beneficial utilization of digestate.

Project Co. will be responsible for digestate management operational decisions including marketing and beneficial end uses. Project Co. will pass through costs of digestate management and associated administration costs to the Region.

## 4. Procurement Plan

As supporting technical studies for the project have been completed and the Site has been acquired, the procurement process to select a project company to design, build, operate and maintain the AD Facility and transfer station can now commence. Staff have developed a detailed procurement plan which considers the procurement risk, incorporates strategies to mitigate the risk and ensures that the procurement is conducted in accordance with best practices, Regional policies, procedures, the procurement by-law and will be compliant with the requirements of trade agreements to which the Region is subject.

In accordance with the procurement plan, the Region will conduct a Request for Prequalification followed by a Request for Proposal.

Through the previous Request for Expression of Interest (Document 2016-460I), staff have created a database of companies that have expressed interest in this Project. Companies that responded to the Request for Expressions of Interest are listed in Appendix II. Those firms who have expressed interest in the Project will be sent a copy of the Notice of Intended Procurement. Additionally, staff will seek to notify potential Proponents in the

marketplace through various advertisement channels (websites, publications, industry journals, etc.).

**a) Request for Prequalification**

The initial phase of the procurement process is a Request for Prequalification process which will identify technologies qualified for use in the AD Facility and teams qualified to design, build, operate and maintain the AD facility.

Proponents will be required to identify a minimum of one and a maximum of three operating reference facility(ies) which use the same core technology and process a similar quantity and composition of organic material to that expected in the Region's AD facility. Based on 24 consecutive months of data (within five years prior to the issuance of the Request for Prequalification) supplied from the operating facility(ies) and the design brief provided for the Region's AD Facility, the Region will assess submissions based on the following:

- completeness and design integration of the Proponent's proposed technology
- similarity of the quantity and composition of the organics processed at the Proponent's operating facility to that which is anticipated at the Region's AD facility
- availability and reliability of the Proponent's reference facility
- quality of digestate and biogas produced
- facility diversion rate, and
- odour prevention, control and treatment measures.

The prequalification of teams will focus on the experience of key team members, their financial capability and capacity, and their proven ability to deliver projects of a similar scope and scale to the Region's AD Facility project.

In addition to the evaluation of the written submission, it is anticipated that the procurement coordinator and the technical evaluators will visit at least one reference facility for each of the top ranked proponents for the purpose of verifying the information supplied in the submission. Out of country travel is anticipated for this evaluation. Based on the outcome of the Request for Prequalification process, a maximum of four teams and their corresponding technologies will be invited to respond to the subsequent Request for Proposal process. Provisions in the procurement process will allow for the resubmission and re-evaluation of prequalified teams and their technologies in the event that material changes to their team or technology occur prior to the submission of the Request for Proposal.

**b) Request for Proposal**

The proponent teams prequalified through the Request for Prequalification process will be invited to participate in a Request for Proposal process. The initial issue of the Request for Proposal will include a draft of the project agreement. Through a series of commercially confidential meetings with each of the proponent teams, staff will discuss concerns with the draft agreement and issues related to the project scope of work. Changes to the draft project agreement may be required to address issues identified during the commercially confidential meetings. Upon completion of the commercially

confidential meetings the Region will issue a final draft of the project agreement to which all proponent teams must bid.

The proposal submissions will be evaluated based upon technical and financial components. The technical and financial scores will be combined to achieve a final score for each compliant proposal. The technical evaluation criteria will include overall AD Facility, transfer station and Site design, process design, ancillary technologies, the proposed development plan and the proposed operations and maintenance plan which will include the lifecycle maintenance plan. The financial criteria will be evaluated based on the net present value of the capital and operations and maintenance costs over the full operating term. Through the evaluation process staff will evaluate any proposed innovations which offer value to the Region.

Following evaluation, staff will conduct limited negotiations which may be consecutive or concurrent with the top scoring proponent or proponent(s) depending upon the outcome of the evaluation. The purpose of these negotiations will be to reach agreement upon details of the project agreement not related to risk or price. The Region will reserve a right to conduct a best and final offer process, if required, to support the final identification of the recommended proponent team. Following this process, staff will return to Regional Council with a recommendation for award.

### c) Procurement Process Timelines

Staff anticipate that the procurement process for this project will take approximately 22 months to complete. The anticipated timelines are as follows:

| | |
|---|---|
| Issuance of Request for Prequalification | January 2018 |
| Close of Request for Prequalification | March 2018 |
| Identification of prequalified proponent teams | June 2018 |
| Issue of Request for Proposal | August 2018 |
| Close of Request for Proposal | April 2019 |
| Completion of Evaluation and Negotiation | August 2019 |
| Recommendation Report to Regional Council | October 2019 |

### d) Single Point of Contact

In accordance with the Region's Purchasing By-law, the Purchasing Advisor assigned to this procurement process by the Finance Department will be designated as the single point of contact for all interests related to the procurement process for this project from the time the Request for Prequalification is issued through to the execution of the project agreement with the awarded project company. During the procurement process a non-contact and anti-lobbying provision will require that proponent teams restrict all communication regarding the project or the procurement process to the designated single point of contact. Proponent teams responding to the Request for Prequalification will be required to execute a confidentiality agreement.

## 5. Community Engagement

Staff will work with the Ward Councillor to develop a communication plan to engage the community surrounding the Site. Components of the community engagement plan could include:

- public meeting, possibly to be held in conjunction with the environmental permitting process; and,
- establishment of liaison group to be in effect during construction and first few years of operation.

A project web page will be active during procurement and construction period to provide updates.

## RISK CONSIDERATIONS

### a) Project Company Performance

In order to ensure the successful execution of the DBOM contract, the following provisions will be included in the procurement process and DBOM contract:

- the Request for Prequalification process will ensure that only teams capable of executing the project will be eligible to respond to the Request for Proposal
- performance requirements will be clearly specified in the contract documents
- AD Facility compliance with the performance requirements will be incentivized by a combination of holdbacks to be released once satisfactory performance has been confirmed
- timely construction will be ensured through liquidated damages for delays attributable to Project Co., and
- during the Operations and Maintenance term, Project Co. will continue to comply with performance requirements, which will be backstopped by liquidated damages, payment set-offs and a letter of credit.

### b) Management of Biogas

The Federal and Provincial policies which could potentially affect the market for renewable natural gas are in development and the outcomes are uncertain. In order to minimize the risk of this uncertainty to the Region, the AD Facility will utilize co-fired boilers (which can operate on biogas or natural gas) which will provide the flexibility to use biogas for process needs first, with the remainder being directed to the biogas to renewable natural gas upgrading system. Additionally, the Region will have the discretion control of how much biogas is used to meet the AD Facility process needs and how much is upgraded to renewable natural gas. Finally, the Region will retain ownership of the renewable natural gas and will have the discretion to direct renewable natural gas to a destination of its choice within the Enbridge distribution area. Alternatively, if a very favourable market price can be obtained for renewable natural gas and it is decided that it will be sold, all biogas can be converted to renewable natural gas.

As there is uncertainty surrounding provincial policies and future market options for renewable natural gas are still evolving, a report will be brought to a future meeting of the Waste Management Strategic Advisory Committee or Regional Council with options and recommendations for use of Peel's renewable natural gas.

To improve the Region's chances of securing an injection and distribution service agreement on price and terms acceptable to the Region, staff will negotiate with Enbridge

concurrent with the procurement process, and by doing so will be able to effect any necessary changes in scope to the project while still being competitively procured.

**c) Management of Digestate**

Generally, there are many AD technology providers and developers and very few digestate management service providers. There is a potential risk of obtaining a good AD developer and less qualified digestate management company or vice versa. In order to minimize the procurement risk to the Region of an unfavorable paring of both services, the procurement of the AD Facility and digestate management services will be conducted separately, with the latter being conducted by Project Co. following award of the AD Facility DBOM contract. This approach will result in the Region getting the best pairing of AD Facility Project Co. and digestate management company.

The risk associated with procurement of digestate management contract will be minimized by requiring Project Co. to conduct the procurement for the service in accordance with the scope and provisions as described in section 3.e), including Regional oversight.

**d) Construction Costs**

The commercial confidential meetings held as part of the Request for Proposal process will reduce the risk that proposals will exceed the project budget.

The Region of Peel will assume limited construction cost risk during the Request for Proposal evaluation period. Proponents will have no control of the length of time between Request for Proposal close and DBOM contact award. Any cost adjustments between Request for Proposal close and DBOM contract award will be adjusted using specific, pre-determined indices in the Request for Proposal. Project Co. will assume construction cost risk following DBOM contract award.

**e) Operations and Maintenance Costs**

During the operations and maintenance term, Project Co. will be paid for the full scope of work associated with the AD Facility on the basis of per-tonne processing fees and flow-through costs of utilities and digestate management. Work associated with the transfer station will be paid on the basis of a fixed monthly rate plus per-tonne fees for materials transferred.

To minimize the Region's cost risk during the operations and maintenance term, proponents will be required to bid the per-tonne fees and fixed monthly rate which will be applicable to the first 12 months of operations, and which will adjusted annually thereafter according to changes in pre-determined price indices. Similarly, prices bid for digestate management, which the Project Co. will pass-through to the Region, will be applicable to the first 12 months of operations and will be adjusted annually thereafter according to changes in pre-determined price indices.

Project Co. will pass-through the cost of utilities (electricity and natural gas) to the Region. In order to minimize the risk to the Region of excessive utility consumption, Project Co. will guarantee the maximum quantity of each utility to be consumed per tonne processed and be responsible for the cost of all utility consumption in excess of the guaranteed amounts. The Region will assume the risk of changes in the unit prices of utilities.

**f) Life-Cycle Maintenance**

Project Co. will be required to conduct the life-cycle maintenance required to maintain the AD Facility and transfer station in a state of good repair such that at the end of the contract the AD Facility and transfer station will be in the same condition as the start of the operations and maintenance term, accounting for normal wear. Project Co. will submit and bid a lifecycle maintenance plan to define the lifecycle maintenance work to be completed over the duration of the Operations and Maintenance term and the associated costs. The Region will maintain an internal reserve account to accumulate funds in anticipation of payment for lifecycle maintenance as it is completed. Project Co. will be required to cover the difference if actual cost of the lifecycle maintenance work exceeds the amount accumulated in the reserve, and will be paid the amount remaining in the internal reserve at the end of the Operations and Maintenance term subject to confirmation of the Facility's condition.

## FINANCIAL IMPLICATIONS

The 2018 Capital Plan requested a budget of $108.7 million for the Facility construction in 2019.

Staff recommend that $6 million from the leaf and yard waste transfer station Capital Project 15-6320 be transferred to the Capital Project 17-6305 for the construction of a transfer station at the Danbro site and the remaining funds be used for the construction of a yard waste transfer station at the Fewster Community Recycling Centre.

Staff are currently making an application to obtain funding from the Municipal Greenhouse Gas Challenge Fund. Staff will continue to investigate other funding opportunities as they arise.

The financial implications of the renewable natural gas Injection Service agreement with Enbridge for the injection and transportation of renewable natural gas will be brought in a future report to the Waste Management Strategic Advisory Committee and Regional Council.

## CONCLUSION

The design, build, operate and maintain contract for the AD Facility and co-located transfer station will be procured in accordance with the strategic terms described in this report.

Subject to Regional Council approval of the recommendation contained in this report, procurement of the DBOM contract for the AD Facility and transfer station will commence in January 2018 with the Request for Prequalification process, followed by a Request for Proposal process.

Staff will report back to Regional Council with the results of the Request for Proposal process including recommendation for award of the DBOM contract for the AD Facility.

Staff will negotiate the Site specific terms of the Injection Service Agreement with Enbridge and will report on the key terms of the agreement to a future meeting of the Waste Management Strategic Advisory Committee and Regional Council for approval.

Janette Smith, Commissioner of Public Works

**Approved for Submission:**

D. Szwarc, Chief Administrative Officer

**APPENDICES**

Appendix I - Description of Biogas Upgrades to Renewable Natural Gas
Appendix II - Request for Expressions of Interest Respondents

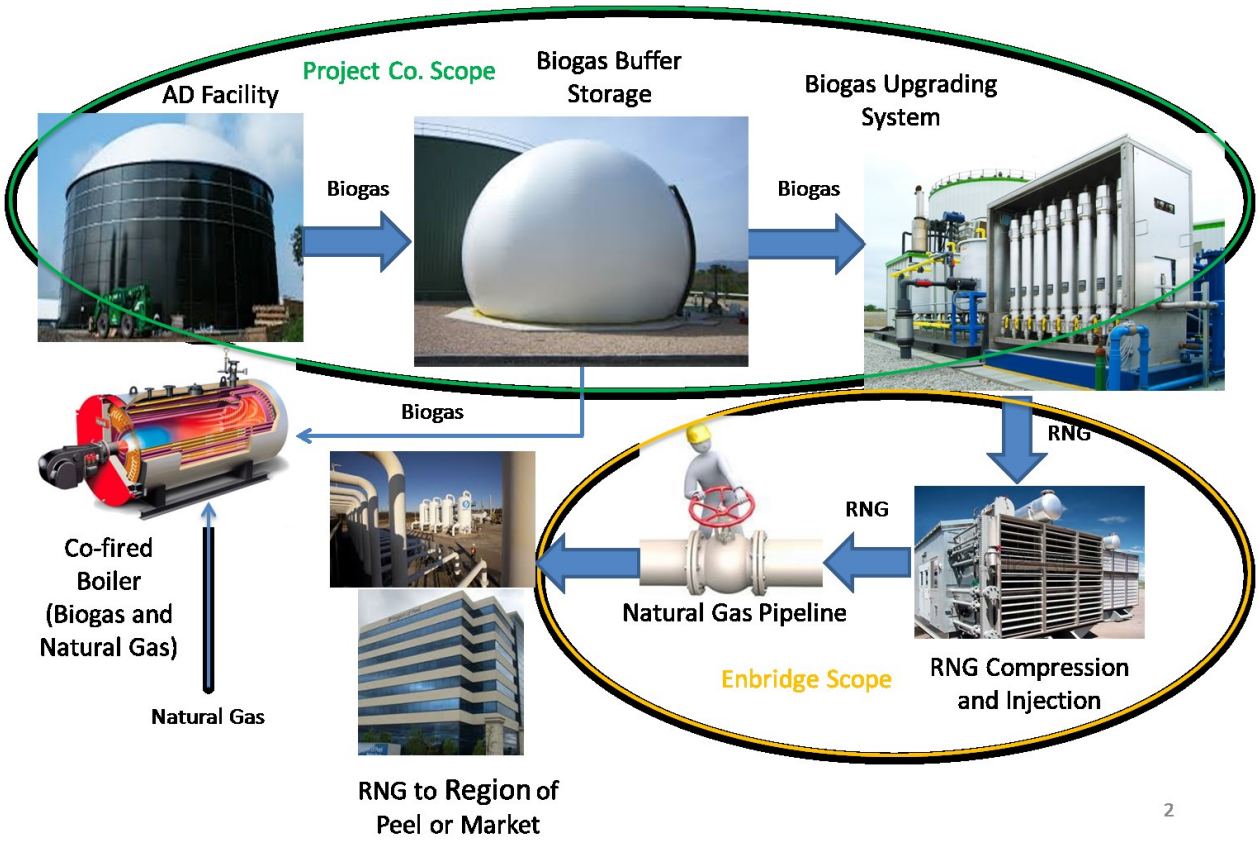
*For further information regarding this report, please contact Norm Lee, Director Waste Management, extension 4703, norman.lee@peelregion.ca.*

*Reviewed in workflow by:*

Financial Support Unit
Purchasing

**APPENDIX I**
**STRATEGIC TERMS FOR THE ANAEROBIC DIGESTION FACILITY PROJECT**

**Anaerobic Digestion Facility Biogas Upgrading System**




Upgrading of Biogas to Renewable Natural Gas

Since biogas production can fluctuate due to various process conditions, the biogas buffer storage enables the biogas upgrading system to receive a constant flow of biogas and evens out changes in composition.

Biogas can be upgraded to produce a pipeline grade, renewable natural gas (RNG) using varying types of technologies. The most common are water wash, vacuum pressure swing adsorption (VPSA) and membrane. Impurities such as hydrogen sulfide are first removed using media or bio-chemical based processes. Then it is compressed and passed an upgrading technology to separate carbon dioxide from methane (minimum 90% recovery), the primary component of natural gas. A quality check (methane content, impurities) is completed prior to the RNG being directed to the Enbridge Gas Distribution Limited (Enbridge) compression and injection station.

Enbridge will conduct a second quality check after final compression (if required depending on the upgrading technology and pipeline pressure) prior to odourization and injection into the pipeline.

The waste gas stream, known as tail gas, which contains a small amount of unrecovered methane, is typically combusted in a flare or thermal oxidizer.

**APPENDIX I**
**STRATEGIC TERMS FOR THE ANAEROBIC DIGESTION FACILITY PROJECT**

Process Heat for the Anaerobic Digestion Facility (AD Facility)
The AD Facility will be designed such that biogas or purchased natural gas can be used to meet building and process heat needs, via the use of a co-fired boiler that can use either fuel. During the operations and maintenance phase of the project, utilities, including natural gas will be pass-through costs, with Project Co. to guaranteeing the quantity used per tonne Organics processed and Region being responsible for rates.

RNG Production
At full capacity, AD Facility and biogas upgrading system is expected to produce 5.7M $m^3$ per year of RNG (assuming no biogas used for process needs). If biogas is first used for building and process heat (which would consume up to 32% of biogas), including pasteurization of Digestate (to meet federal fertilizer requirements) then 3.9M $m^3$ per year of RNG would be produced.

The Region's natural gas consumption in 2016 was 14.4M $m^3$, including Regional offices, Peel Long Term Care facilities, Peel Living buildings and water and wastewater treatment plants. The curbside contracted waste collection fleet RNG consumption in 2016 was 6.3M $m^3$.

**APPENDIX II**
**STRATEGIC TERMS FOR THE ANAEROBIC DIGESTION PROJECT**

**Request for Expressions of Interest (Document 2016-460I) Respondents**

| Company Name | Project Role (Developer, Designer, Technology Provider, Constructor, Operations and Maintenance Provider, Output Management Provider) |
|---|---|
| 344016 Ontario Ltd. | Not identified in submission |
| Anaergia DB LLC | Developer, Designer, Technology Provider, Output Management Provider |
| BDP Industries | Output Management Provider |
| BIO-EN Power | Technology Provider, Operations and Maintenance Provider, Output Management Provider |
| BIOFerm Energy Systems | Developer, Designer, Technology Provider |
| GE Water & Process Technologies Canada | Designer, Technology Provider |
| Hitachi Zosen Inova USA, LLC | Developer, Designer, Technology Provider, Constructor, Operations and Maintenance Provider, Output Management Provider |
| JM Smith International, LLC | Not identified in submission |
| Kenaidan Contracting LTD | Constructor |
| Maple Reinders | Developer, Designer, Constructor, Operations and Maintenance Provider, Output Management Provider |
| Miller Waste Systems Inc. | Developer, Constructor, Operations and Maintenance Provider, Output Management Provider) |
| North America Construction (1993) Ltd. | Developer, Designer, Constructor |
| Novatech Analytical Solutions | Technology Provider |
| Ontario Clean Water Association | Operations and Maintenance Provider, Output Management Provider |
| Orgaworld Canada Ltd. | Developer, Designer, Operations and Maintenance Provider, Output Management Provider |
| O.W.S., Inc. | Designer, Technology Provider, Constructor, Operations and Maintenance Provider, Output Management Provider |
| Peel Biofuel Grp (Buttcon Energy Inc./GFL Environmental/Wright Tech Systems Inc. | Developer, Designer, Technology Provider, Constructor, Operations and Maintenance Provider |
| StormFisher Ltd. | Developer, Constructor, Operations and Maintenance Provider, Output Management Provider) |
| Suez Canada Waste Services | Developer, Designer, Operations and Maintenance Provider, Output Management Provider |
| Team Gemini LLC | Developer, Designer, Technology Provider, Operations and Maintenance Provider, Output Management Provider |
| Urbaser SA | Developer, Designer, Technology Provider, Constructor, |

**APPENDIX II**
**STRATEGIC TERMS FOR THE ANAEROBIC DIGESTION PROJECT**

| **Company Name** | **Project Role (Developer, Designer, Technology Provider, Constructor, Operations and Maintenance Provider, Output Management Provider)** |
|---|---|
| | Operations and Maintenance Provider, Output Management Provider |
| Veolia Water Technologies Canada Inc. | Developer, Designer, Technology Provider, Constructor, Operations and Maintenance Provider, Output Management Provider |
| Walker Environmental Group Inc. | Developer, Operations and Maintenance Provider, Output Management Provider |
| Waste Treatment Technologies Netherlands B.V. | Developer, Designer, Technology Provider, Constructor |
| Weltec BioPower GmbH | Designer, Technology Provider |
| Wessuc Inc. | Not identified in submission |
| WesTech Engineering Inc. | Designer, Technology Provider |
| W.S. Nicholls Construction Inc. | Developer, Constructor |
| Yield Energy Inc. | Designer, Technology Provider, Operations and Maintenance Provider |