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# The Regional Municipality of Durham Report

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To: Regional Council  
From: Commissioner of Works, Commissioner of Finance, and Commissioner of Corporate Services  
Report: #2020-COW-20  
Date: May 27, 2020

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**Subject:**

Organics Management Solution – Joint Venture/Co-ownership with Epcor Utilities Inc., Recommended Project Site, Current Business Case and Risk Assessment Update, and Procurement Process

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**Recommendations:**

That it be recommended to Regional Council:

- A) That Regional Municipality of Durham (“Region”) staff be authorized to pursue a joint venture/co-ownership relationship with Epcor Utilities Inc. (“EPCOR”) for the co-development of the Region’s long-term organics waste management solution, including a mixed waste transfer facility, a pre-sort facility and an anaerobic digester with biomethane upgrading system (the “Project”);
- B) That Regional staff be authorized to continue negotiations with EPCOR to establish a Co-Owners’ Agreement and other ancillary agreements to the Co-Owners’ Agreement;
- C) That 393 Courtice Road, Municipality of Clarington (“South Clarington Site”) be approved as the recommended development site for the Project based on the siting evaluation enumerated herein;
- D) That Regional staff be authorized to issue the Request for Prequalification in or around June 2020; and

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- E) That approval be granted for up to an additional \$1.25 million (to be funded from the approved Project Budget) in external consulting fees up to the Request for Proposal close and selection of a preferred Design, Build, Operate and Maintain (“DBOM”) vendor team. These consulting fees include up to \$800,000 for Deloitte LLP, up to \$400,000 for WeirFoulds LLP, and \$50,000 for P1 Consulting.
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**Report:****1. Purpose**

- 1.1 The purpose of this report is to provide an update to Regional Council on all aspects of the Project and to obtain authorization and approval from Regional Council on the items set out in the recommendations of this report.

**2. Evaluation of Joint Venture Relationship with EPCOR**

- 2.1 Pursuant to Report #2019-COW-22, Council authorized Regional staff to commence negotiations with EPCOR to explore the possibility for a joint venture relationship with the Region on the Project.
- 2.2 In October 2019, senior management commenced negotiations with EPCOR. Through negotiations, the parties have principally agreed to the following that will govern the joint venture relationship and underlie the terms of a resulting Co-Owners’ Agreement:
- a. The parties will each contribute 50 per cent of the initial capital for the Project and both parties will own a 50 per cent interest in the Project. The Region will own a 100 per cent interest in the lands upon which the Project is built, and the Region will enter into a land lease agreement with the joint venture;
  - b. The parties will share, unless otherwise negotiated, revenues, capital contributions, risks and liabilities of the Project;
  - c. The Region will be the feedstock supplier;
  - d. The Project will be governed by an Owners’ Steering Committee and a Management Committee with appointees from each party; and,
  - e. The Region retains ownership/self determination at year 20 to continue partnership (i.e. the Region retains ownership with no “buy back costs”).

- 2.3 The evaluation of a potential joint venture with EPCOR was based on discussions and mutually agreed upon data with EPCOR, Regional staff, and the Region’s technical and financial consultants (GHD and Deloitte).
- 2.4 Deloitte assessed the costs, risks and benefits to the Region in both a joint venture scenario and in a scenario where the Region was the sole Project owner. In both scenarios, the Region was assumed to be the solid waste feedstock provider.
- 2.5 Based on this assessment to date, the joint venture will result in a net present benefit to the Region of up to \$40 million over the life of the Project if the following two conditions are satisfied: 1) EPCOR agrees to share key Project owner risks with the Region; and 2) the revenues arising from the joint venture are not subject to corporate taxation. If these two conditions are not satisfied, the joint venture will result in a net present cost to the Region of \$30 million over the life of the Project.

**Figure 1: Net Present Value Cost of Sole Ownership vs Joint Venture Over Life Span of Project**

	Scenario 1 Joint Venture Tax Exempt	Scenario 3 Sole Ownership	Scenario 2 Joint Venture Fully Taxable
DBOM and Site Project Costs less Revenues	\$352	\$352	\$352
Capital Financing	\$126	\$162	\$126
JV Specific Components	\$58		\$101
Region Retained Risk	\$69	\$131	\$96
<b>Total</b>	<b>\$605</b>	<b>\$645</b>	<b>\$675</b>

- 2.6 This benefit/cost range is illustrated in **Figure 1** above which demonstrates that if the Region carries out the Project as a sole owner (**Scenario 3**), the net present cost of the Project to the Region would be \$645 million. This is compared to the two joint venture scenarios:
  - a. **Joint Venture Scenario 1:** The Region shares key Project risks with EPCOR and Project revenues are not taxed. In this scenario, the net

present cost of the Project to the Region is \$605 million, which represents a \$40 million net present benefit to the Region; or

- b. **Joint Venture Scenario 2:** The Region retains change in law Project Owner risk and Project revenues are taxed. In this scenario, the net present cost of the Project to the Region is \$675 million, which represents a \$30 million net present cost to the Region.

2.7 In addition to this quantitative evaluation, Regional staff and its consultants assessed the qualitative benefits of pursuing the joint venture relationship with EPCOR. EPCOR has extensive experience as an owner and proponent in large infrastructure projects and EPCOR has a firm understanding of working with a government body given its unique municipal roots. As such, EPCOR can provide insight into many aspects of the Project including:

- a. Risk Mitigation:

- Sharing and managing risk expenditures and steering the Project away from unnecessary risks;
- Sharing Project obligations including residual risks;
- Maximizing potential renewable natural gas revenue;

- b. Project Efficiencies and Expertise:

- Procurement and contract experience in a market which EPCOR is familiar
- Review proposed designs and ways to improve them; and,
- Provide expertise regarding project management during the construction and operation phases.

2.8 EPCOR can bring internal financial, engineering, legal, procurement, and project management services to the Project. Further, EPCOR is experienced in the North American renewable natural gas market and can use its industry position to access favourable pricing and contract terms in the renewable natural gas markets. EPCOR has indicated it can secure a contract for the sale of renewable natural gas on behalf of the Project to maximize energy revenues.

2.9 The Co-Owners' Agreement will contemplate Owners' Steering and Management Committees with equal representatives from the Region and EPCOR. The Region's participation on these committees will ensure that EPCOR's business objectives are consistent with the Region's public service delivery.

- 2.10 Based on the foregoing, Regional staff have concluded that pursuing a Co-Owners' Agreement with EPCOR is in the best interest of the Region to deliver the Project. However, should the Co-Owners' Agreement negotiations not result in net benefits to the Region, a Co-Owners' Agreement will not be executed, and the Region will proceed with the Project as a sole owner. Further, if the joint venture becomes untenable during the life of the Co-Owners' Agreement, reasonable contractual off-ramp provisions will be included in the Co-Owners' Agreement and ancillary agreements.
- 2.11 Some of the anticipated ancillary agreements include a feedstock agreement which will govern the supply of waste being provided to the Project for processing; a ground lease agreement which will govern the lease of the Project lands from the Region to the joint venture, and a renewable natural gas agreement which will govern the sale of renewable natural gas to an end user.

### 3. Siting

- 3.1 As outlined in Report #2019-COW-22, Regional staff developed siting criteria set out in the Siting Report (which is publicly available on the Region's website). The evaluation criteria, results and conclusions are summarized in **Attachment #1** to this report.
- 3.2 The evaluation results demonstrated that the South Clarington Site is the best location for the Project based on environmental impacts, transportation considerations, site infrastructure, synergies with the Durham York Energy Centre ("DYEC") and the Courtice Water Pollution Control Plant. The preferred site does not have any demolition or remediation requirements to prepare for Project construction.
- 3.3 The South Clarington Site is within the Energy Park that includes the DYEC. As part of the DYEC project, the Region purchased the property, which includes the recommended Project site, for net \$4.7 million. The following investments were made by the Region within the Energy Park:
- a. The Region invested \$4.9 million to upgrade the road network to the site to accommodate volumes of traffic that would be generated, including a dedicated road for waste delivery trucks along the Canadian National Railway track. There will be a minimal increase in traffic due to the Project (i.e. two trucks per 12 hours) and there will be no queuing of trucks on the public roads;

- b. The Region invested \$5.4 million to install the utilities and servicing on-site along with upgrade of natural gas line to the Energy Park; and
  - c. The Region invested \$1.8 million to provide a stormwater management system for the Energy Park.
- 3.4 In addition to the significant climate change benefits of the renewable natural gas produced, the South Clarington Site will reduce the impacts of transportation, allow for the utilization of heat/energy between the DYEC, the Courtice Water Pollution Control Plant and the anaerobic digester, and create an opportunity to generate additional renewable natural gas from the methane currently flared at the Courtice Water Pollution Control Plant. These benefits will help the Region address the climate change emergency.
- 3.5 The Municipality of Clarington declared itself an “unwilling host” for the Project based on perceived incompatible land use. Report #2020-WR-1, included in this meeting’s agenda (May 27, 2020), addresses the specific comments from the Municipality of Clarington. The Project will be designed to ensure there are zero odours, and as a biological process there will be no air emissions based on design of the facility with negative pressure and an air treatment system. The truck traffic will be restricted to roads outside of the Energy Park.
- 3.6 The Municipality of Clarington recently expanded the review of the Energy Park Secondary Plan to consider the development of a waterfront that will include residential and recreational uses. The Project and its activities will not preclude the waterfront development given its localized impact zone and given the location is north of the railway corridor, it will provide a visual barrier to the Project. The Region has supported the waterfront development through a land transfer to the Municipality of Clarington and a further investment of \$190,000 for the construction of the waterfront trail.
- 3.7 In the comparative site analysis, the remaining sites would require significant investment in road structures, utilities, environmental mitigation and demolition or remediation costs. An assessment of the potential upgrades/remediation at the other sites considered as potential locations for the Project indicated that additional cost could range from \$13 million to \$117 million. This range of costs does not include any potential costs to mitigate currently unknown site-specific impacts.

#### **4. Procurement Process**

- 4.1 As outlined in Report #2019-COW-17, Council approved a two-step Request for Prequalification and Request for Proposal procurement strategy. Since then, Regional staff have been working with the Region's consultants and EPCOR to develop the Request for Prequalification documentation. The Request for Prequalification will be adaptable based on the final ownership model.
- 4.2 The Request for Prequalification identifies the service delivery model for the Project as a Design Build Operate and Maintain. The Request for Prequalification will evaluate the proponent's submissions on the following:
- a. Technical: proposed conceptual process and example of facility of similar scale and scope, as evidence of experience;
  - b. Team: experience, composition and leadership; and,
  - c. Financial: track record and experience, financial approach, and financial capacity and condition.
- 4.3 It is anticipated that the Request for Prequalification will be posted publicly in or around June 2020 and will be available for vendors/consortia to respond and submit proposals over six weeks. The results of the Request for Prequalification will form the basis for the subsequent Request for Proposal.

#### **5. Consulting Fees**

- 5.1 In Report #2019-COW-8, Council approved up to \$300,000 in legal, financial and fairness monitor consulting fees. To date, the Region has utilized these consulting fees to pursue and assess the value of a Co-Owners' Agreement with EPCOR, to develop the Project's procurement process, business case, and risk assessment.
- 5.2 While the Region mitigated external costs by relying on the Region and EPCOR's internal resources/expertise, additional consulting fees up to the amount of \$1.25 million, plus applicable taxes, are required for Project up to the close of the Request for Proposal process and selection of a preferred DBOM vendor team.
- 5.3 It is expected that any external costs associated with development activities on the Project will ultimately be shared with EPCOR if a Co-Owners' Agreement is executed between the parties. As such, Regional staff will report back on the status of these consulting dollars once the Co-Owners' Agreement is ratified.

- 5.4 **Financial Consulting Services:** It is anticipated the additional fees for Deloitte LLP's services will be up to \$800,000 to provide financial and business advisory services for the procurement phases (Request for Prequalification and Request for Proposal), commercial negotiations (with the Design Build Operate and Maintain vendor and EPCOR), business case updates and Co-Owners' Agreement negotiations.
- 5.5 **Legal Services:** It is anticipated that the additional fees for WeirFoulds LLP's services will be up to \$400,000 to provide legal services related to the drafting and negotiating of the Co-Owners' Agreement and its ancillary agreements, the DBOM Agreement and the procurement process.
- 5.6 **Fairness Monitor:** It is anticipated that the additional fees for P1 Consulting services will be up to \$50,000 to oversee the Project's procurement process.
- 5.7 **Technical Support:** It is anticipated that the current contract with GHD will provide the services necessary to complete the Request for Proposal to the award stage.
- 5.8 These consulting estimates are currently below industry practices of between 7 per cent to 12 per cent of capital costs for consulting fees for large comparable infrastructure projects.
- 6. Overview of Current Business Case, Risk Analysis and Financial Implications**
- 6.1 Previous business case analyses and risk assessments for the Project were presented to Council in June 2017 (Report #2017-COW-180), June 2018 (Report #2018-COW-146) and June 2019 (Report #2019-COW-17).
- 6.2 An overview of the updated business case and projected financials are attached hereto as **Attachments #2 and #3**. The updated risk assessment is attached hereto as **Attachment #4**. These analyses are based on updated and new information currently known to staff. As more information becomes available through the procurement process and joint venture negotiations, the business case and financials will be further refined.
- 6.3 Finally, the Region's Finance Department continues to monitor and explore potential funding sources and options for Project financing, including maximizing any development charges opportunities. The Region's share of the Project's financing will be developed and brought forward to Regional Council for approval after the DBOM vendor is selected.

## **7. Conclusion**

- 7.1 The Project will resolve several current and emerging issues including:
- a. Meeting the anticipated provincial organic and Regional Council-directed diversion requirements;
  - b. Accommodating the processing demands of a growing population and creating capacity at the DYEC resulting in the ability to delay expansion of the DYEC beyond 2030;
  - c. Meeting diversion targets with the addition of a pre-sort facility which is estimated to double the volume of household organics for diversion; and
  - d. Addressing very limited options given the current status of both landfill and composting capacity.
- 7.2 The Project will also contribute to the Region's objectives of addressing the climate change emergency and supporting the Region's strategic sustainability initiatives.
- 7.3 The implementation of this Project includes a mixed waste transfer station, pre-sort facility and anaerobic digestion facility. The recommended site, located in the Energy Park, will allow for synergies with the DYEC thereby establishing a fully integrated campus for Durham's waste management.
- 7.4 Based the need for this Project and the established direction and approval for Project implementation, Regional staff request that Council authorize and approve the recommendations in this report.

## **8. Attachments**

Attachment #1: Site Evaluation of South Clarington Site

Attachment #2: Updated Current Business Case

Attachment #3: Summary List of Current Business Case Inputs and Assumptions

Attachment #4: Updated Risk Assessment

Respectfully submitted,

**Original signed by:**

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Susan Siopis, P.Eng.  
Commissioner of Works

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Nancy Taylor, BBA, CPA, CA  
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Recommended for Presentation to Committee

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Elaine C. Baxter-Trahair  
Chief Administrative Officer

## Site Evaluation of South Clarington Site

As outlined in Report #2019-COW-22, Regional staff, in consultation with GHD, developed siting criteria for identifying a co-location for the mixed waste transfer, pre-sort and anaerobic digester facilities, including:

- a. Prevention, reduction, and elimination of impacts to the environment;
- b. Protection and conservation of natural resources and ecologically sensitive areas; and
- c. Integration of social and economic considerations.

The siting criteria was used to narrow the long list of 16 Regionally owned site to the short list of the following six sites:

**Table 1: Siting Short-List**

ID	Municipality	Site Name	Address	PIN	Utilization	Remaining Site Size (ha)
1	Clarington	South Clarington	339 Courtice Road, Clarington	266050113	Vacant	27.95
	Clarington		1797 South Service Road, Clarington	266050114		
	Clarington		1797 South Service Road, Clarington	266050116		
2	Township of Scugog	West Scugog	#10 Regional Road No. 21	268190095	Scugog Depot Site	41.35
3	Clarington	North Clarington	9293 Woodley Rd, Municipality of Clarington, ON.	267430092	Darlington Closed Landfill - Located within CLOCA conservation area. Currently being used by Flyers Club	8.49
4	Oshawa	Oshawa	1640 Ritson Road North, City of Oshawa, ON	162700206	Former City of Oshawa Landfill - current location of WMF	29.32
5	Township of Scugog	East Scugog	1623 Reach Street, Port Perry, ON	268040072	Closed Landfill - houses WMF - Parent property includes Water Pollution Control Plant (WPCP).	90.31
6	Whitby	Whitby	4600 Garrard Road, Whitby	162650054	MRF	12

The short list was presented to Regional staff, area municipality staff and the public on the following dates:

- a. February 19, 2020 – presented to staff from the local area municipalities;
- b. February 25, 2020 – presented to the Energy from Waste-Waste Management Advisory Committee; and,
- c. February 27, 2020 – presented to the public at a Public Information Centre; prior to the Public Information Centre, letters were sent out to the surrounding communities for each of the potential locations.

The short list of sites underwent a comparative evaluation which included the following criteria:

- a. Environmental (air quality, odour, noise, terrestrial, surface water and groundwater, species of concern and agricultural);
- b. Social (sensitive receptors, land use/zoning, transportation and visual);
- c. Cultural (archeological and heritage);
- d. Technical (permitting/approvals, safety, suitability, utilities and services); and
- e. Economic (capital costs, transportation and waste transfer costs).

On March 6, 2020, GHD released the Draft Siting Report – Mixed Waste Transfer/Pre-Sort and Anaerobic Digestion Organics Processing Facility. A copy of the Draft Siting Report is published on the Regional website ([durham.ca/ADProject](https://www.durham.ca/en/living-here/anaerobic-digestion.aspx#Waste-Pre-Sorting-and-Anaerobic-Digestion-Facility-Draft-Siting-Report)) for public viewing (<https://www.durham.ca/en/living-here/anaerobic-digestion.aspx#Waste-Pre-Sorting-and-Anaerobic-Digestion-Facility-Draft-Siting-Report>).

The Draft Siting Report identifies the South Clarington Site as the recommended site for the Project after a fulsome review of potential sites. Based on the comparative evaluation of the short list, the South Clarington Site is the recommend site based on the following:

- a. There are no off-site sensitive receptors within 500 metres of the site;
- b. There are no policy conflicts from a provincial policy/plan perspective (i.e. Oak Ridges Moraine, Greenbelt, etc.);

- c. There are no wetlands on-site and limited areas of Source Water Protection Plan designations (small portion of site);
- d. The Project is consistent with the existing, proposed and surrounding land uses and land use designations. The site is within the Municipal Official Plan designation of Business Park and the Regional Official Plan designation of Employment Area. With respect to Employment designation, this facility will provide employment in the range of 30 to 40 full time positions (estimated). The zoning designation is Industrial (M);
- e. The Project fits into the Energy Park's sustainable development and design standards, and future opportunities in the renewable and alternative energy sector. This would also meet the Provincial objectives of ensuring facilities are well-planned and suitably sited to ensure long-term effectiveness of the resource recovery system and campus;
- f. The road network to the site has been upgraded to accommodate volumes of traffic that would be generated for the proposed use, including a dedicated road for waste delivery trucks along the Canadian National Railway track;
- g. The site has no archaeological significance based on past studies;
- h. The utilities and servicing are available on-site with the natural gas line in close proximity;
- i. The site provides the lowest capital costs (remediation, demolition and utilities);
- j. The site provides the lowest transportation costs and reduced transportation emissions as waste material outputs from the Project could enter the DYEC in close proximity; and
- k. There are synergies with the existing solid waste management infrastructure i.e. DYEC and Courtice Water Pollution Control Plant. By removing the organic waste material (source separate organics and facility separated organics) through the pre-sorting process, the DYEC will be able to produce additional electricity per tonne of waste. Further, the Courtice Water Pollution Control Plant may be able to treat effluent from the Project and provide additional biogas for upgrading.

## **2020 Current Business Case Update and Project Financial**

The updated current Project financials are compared to the current (status quo) integrated waste management system and are presented over a 24-year period based on a 20-year operating period commencing in 2024. Deloitte peer reviewed the Regional business case and updates thereto.

### **The Project Business Case Update – New and Updated Information**

Since the 2019 business case report (Report #2019-COW-17), Regional staff, working with the Region's Project team and EPCOR, have updated and refined expenditures and revenues based on new data:

- a. Base-year data was updated to reflect actual household and tonnage values for 2019 mixed wastes and Green Bin organics (previous base was 2018 actuals) with revised household growth projections and tonnage forecast to 2043;
- b. Updated Project costs and contract rates and escalation benchmarks for waste transfer and haulage, organics processing, disposal costs and recoverable materials' revenue;
- c. Continued assumption of processing facilities' capacities totaling 160,000 tonnes for mixed garbage waste pre-sort and 110,000 tonnes for Green Bin organics and facility separated organics at the anaerobic digester;
- d. Recommended injecting of upgraded renewable natural gas into the distribution system for sale to available end markets to maximize revenues
- e. Estimated costs related to the establishment of the joint venture with EPCOR; and,
- f. Costs were reset based on an updated planned construction schedule with discounted cash streams brought to a 2020 net present value.

Based on the above noted data, both capital and operational nominal cost estimates were updated and have increased.

## Current Capital Estimates

**Table 2** summarizes the current capital estimates as nominal costs.

**Table 2: Updated 2022-2023 Capital Cost Estimate (Nominal Costs)**

<b>Capital Project Costing Update</b>	<b>2020-COW-20 (\$ million)</b>
Pre-sort/Transfer Facility	46.5
Anaerobic Digestion Facility	128.1
Biogas Upgrading and Injection	12.2
Additional Construction Related Expenditures	5.8
<b>Total Capital Costs</b>	<b>192.5</b>

Notes:

- 1) EPCOR will contribute half of the initial capital costs.
- 2) For the sole purpose of the business case, \$10.4 million was used as land value estimate. The Region wholly owns the land on which the Project is proposed to be built.

## Updated Operating Costs Estimates

The updated operating costs estimates for the first year of operations (anticipated in 2024) and over the 20-year period are outlined in Table 3 below. New to this year's updated analysis are the joint venture costs, energy by-product costs and revenues, and positive impacts to the DYEC operating and haulage costs.

It is important to note that continuing discussions with EPCOR and subsequent agreements may impact the business case, allocation of risk and financial results presented here, both positive and negative. Regional staff will continue to provide updates to the business case and risk assessment at key Project milestones. Business case results could still change as the Project moves forward including, without limitation:

- a. Design Build Operate and Maintain contract development including development of performance specifications, project guarantees, securities and refinements based on short-listed vendor technologies;
- b. Actual Design Build Operate and Maintain vendor team competitive pricing for design, construction and operations and maintenance fees;

- c. Changes in construction and operations costs due to commodity price changes, availability of skilled labour requirements, and/or potential project delay;
- d. Obtaining necessary permits and approvals for siting;
- e. Changes to regulatory requirements or by-product markets and pricing; and,
- f. Actual costs related to site servicing and renewable natural gas injection, transportation and sales.

**Table 3: Operating and Maintenance Cost-Nominal Incremental Costs for Life of Project**

<b>20-Year Operating Cost Estimates</b>	<b>2024</b> (\$ millions)	<b>2025-43</b> (\$ millions)	<b>Total</b> (\$ millions)
<b><u>Operating Costs</u></b>			
Pre-Sort/Transfer Operations	\$ 10.5	\$ 313.5	\$ 324.0
Organics Processing through AD (SSO and FSO)	\$ 9.4	\$ 269.5	\$ 278.9
Status Quo SSO Compost Processing Savings	\$ (8.2)	\$ (254.7)	\$ (262.9)
Digestate Management	\$ 1.5	\$ 45.8	\$ 47.3
Transfer, Haulage, DYEC/Bypass Disposal Costs	\$ (1.2)	\$ (49.5)	\$ (50.7)
Other Site/Project Operating Costs	\$ 1.8	\$ 44.0	\$ 45.7
Biogas Upgrading and Injection Operating	\$ 0.7	\$ 21.8	\$ 22.5
<b>Operating Costs Before Revenues Sub-Total</b>	<b>\$ 14.4</b>	<b>\$ 390.5</b>	<b>\$ 404.9</b>
<b><u>Revenues</u></b>			
Enhanced Materials Recovery and RNG Revenues	\$ (3.4)	\$ (92.1)	\$ (95.5)
<b>Revenues Sub-Total</b>	<b>\$ (3.4)</b>	<b>\$ (92.1)</b>	<b>\$ (95.5)</b>
<b>Total Nominal Net Operating Costs</b>	<b>\$ 11.1</b>	<b>\$ 298.3</b>	<b>\$ 309.4</b>

The Region will also incur costs as part of the joint venture with EPCOR. These estimated costs are based on discussions and negotiations with EPCOR to date. They include payments to cover the returns on, and of, the equity investment by the Co-Owners, potential corporate income tax on the joint venture's revenues, and changes in the joint venture's annual net working capital to cover expenditures.

As a Co-Owner, the Region will receive half of the share of annual dividend payments to the Co-Owners. Currently, the estimated joint venture costs for the Region range between \$118 million and \$208 million depending on how the joint venture and the Project revenues are taxed. This assessment will be an important driver in determining the benefit/cost of the joint venture to the Region.

## Sensitivity Analysis

Given the current stage of the Project, a sensitivity analysis was undertaken to identify potential impacts from changing Project variables, which can affect the updated business case results presented here within.

The sensitivity analysis has led to the identification of key factors that impact the total Project net cost, as seen in **Table 4**.

**Table 4: Project Sensitivity Analysis  
Nominal over 20 years of the Project**

<b>Sensitivity</b>	<b>Project Nominal Cost/ (Savings)</b>
Capital costs increased/decreased +/-10% from base costs	+/- \$46 million
Operating costs increased/decreased +/-10% from base costs	+/- \$53 million
Digestate disposal costs reduced by 100% from base costs	(\$48 million)
Renewable natural gas contract revenues increased to \$22/GJ + annual indexing	(\$45 million)

Any changes to the Project expenditures and revenues, as highlighted in the table above, can have a significant impact on the overall Project costs. As the Project progresses and these capital, operating and revenue inputs change, there are consequential impacts to the overall Project costs including: financing costs, joint venture costs, revenue recovery, and Design Build Operate and Maintain related costs for construction, operations and maintenance.

Please note that these sensitivities are contemplated over the life of the Project and will be refined as the Project develops through to the conclusion of the RFP.

### Summary List of Current Business Case Inputs and Assumptions

Description	Assumption
Base waste tonnage	<ul style="list-style-type: none"> <li>Region of Durham actual waste values for Source Separated Organics (Green Bin), mixed waste for single family and multi-residential and Regional waste management facilities for 2019</li> </ul>
Household and tonnage growth projections	<ul style="list-style-type: none"> <li>Planning Report #2019-INFO-90 and converging to Regional Official Plan values to 2031. Projections for 2032 and beyond based on Hemson Consulting Ltd. Greater Golden Horseshoe Growth Forecasts to 2043. Tonnage per household per year based on 2019 values.</li> </ul>
Waste composition for mixed waste	<ul style="list-style-type: none"> <li>2019 Region of Durham Waste Composition Study Results</li> <li>Organic fraction of municipal waste for single family: 41.5 per cent plus recoverable fibres</li> <li>Organic fraction of municipal waste for multi-residential: 42.6 per cent plus recoverable fibres</li> <li>80 per cent recovery of organics at pre-sort</li> <li>Organic fraction of municipal waste includes pet and sanitary waste</li> </ul>
Contamination rates of organics	<ul style="list-style-type: none"> <li>3 per cent for Source Separate Organics (Green Bin)</li> <li>20 per cent for organic fraction of municipal waste in base case</li> </ul>
Capital costs for pre-sort/transfer facility	<ul style="list-style-type: none"> <li>Sizing of 160,000 tonnes of mixed waste processing capacity</li> <li>\$250 per design tonne in base case</li> <li>Sensitivity of +/-10 per cent of base unit cost</li> </ul>
Capital costs for AD processing facility	<ul style="list-style-type: none"> <li>Assumed sizing of 110,000 tonnes of processing capacity in base case</li> <li>\$1000 per design tonne in base case</li> <li>Sensitivity of +/-10 per cent of base unit cost</li> </ul>
Debenture assumptions	<ul style="list-style-type: none"> <li>3.46% interest rate over 20 years</li> </ul>

Description	Assumption
Operating costs for pre-sort/transfer	<ul style="list-style-type: none"> <li>• \$80 per processed tonne in base case</li> <li>• Sensitivity of +/-10 per cent of base unit cost</li> </ul>
Operating costs for AD processing facility	<ul style="list-style-type: none"> <li>• \$90 per processed tonne in base case</li> <li>• Sensitivity of +/-10 per cent of base unit cost</li> </ul>
Transfer/haulage, disposal, DYEC operating and organics composting costs	<ul style="list-style-type: none"> <li>• Per contracted rates and escalated annually per CPI and/or diesel fuel pricing escalators</li> </ul>
Digestate disposal cost	<ul style="list-style-type: none"> <li>• \$88 per tonne of output (unchanged from 2019 update). Sensitivity assumes marketable digestate by-product where revenue neutrality is achieved</li> </ul>
Land acquisition cost	<ul style="list-style-type: none"> <li>• \$865,000/ha of assumed-serviced land. Assumed approximately 12 ha for pre-sort/transfer, anaerobic digester processing and biogas upgrading facility based on GHD siting evaluation</li> </ul>
Life cycle costing	<ul style="list-style-type: none"> <li>• 2 per cent of initial capital outlay annually over 20 years for pre-sort/transfer and AD facilities</li> </ul>
Biogas upgrading and injection facility	<ul style="list-style-type: none"> <li>• Biomethane upgrading and injection capital system upgrade at a total of \$10.4 million (current costs) where \$3 million assumed as gas distribution upgrades. Operating costs per m<sup>3</sup> based on gross biogas produced at \$0.085/m<sup>3</sup></li> <li>• Provision for life cycle costs based on 0.5 per cent of initial capital outlay plus mid-life membrane replacement</li> </ul>
Contracted renewable natural gas sales rates	<ul style="list-style-type: none"> <li>• \$15/GJ non-indexed for base case and \$22/GJ + annual indexing (per CPI at 2%/year) for sensitivity</li> </ul>
Materials recovery revenues	<ul style="list-style-type: none"> <li>• Base costs (escalated annually) assumed as net of cost to end-market:</li> <li>• Ferrous materials: \$150/tonne, non-ferrous materials: \$1,000/tonne</li> <li>• PET plastics: \$425/tonne, HDPE plastics: \$445/tonne</li> </ul>

Description	Assumption
Additional project and site operating expenses	<ul style="list-style-type: none"><li>• Annual insurance, property taxes, site maintenance and weigh scale staffing at total \$1 million per year (current dollars)</li><li>• Parental guarantees at \$100,000 total per year (nominal)</li><li>• Renewable natural gas transportation at \$2.50/GJ for all renewable natural gas sold</li></ul>
Joint venture corporate structure	<ul style="list-style-type: none"><li>• Debt-Equity Structure for Joint Venture: 60% debt, 40% equity</li><li>• Return on Equity: 9.52%</li><li>• Weighted Cost of Capital: 5.88%</li><li>• Corporate Tax Rate: 26.5%</li></ul>
Escalators and discount factors	<ul style="list-style-type: none"><li>• 2% per year for general inflation</li><li>• 2.5% per year for diesel price escalation</li><li>• 3.5% per year for general construction escalation</li><li>• 5% discount rate</li></ul>

## Risk Assessment Update

The assessment and allocation of potential risks and risk mitigation strategies are important because:

- They provide potential respondents to the Request for Prequalification/Request for Proposal information on the potential joint venture and risk transfer from the Owner to the Design Build Operate and Maintain vendor to advise their bid submissions; and,
- They provide key input into the joint venture evaluation.

The risk assessment process, led by Deloitte, included the Project team comprised of Regional staff, consultants and EPCOR, identified and quantified up to 150 Project risks and allocated the risk transfer set out in **Table 5**.

It is important to note that change in law risks, which can impact operations, digestate management, waste feedstock and/or other waste management requirements is currently being negotiated between the Region and EPCOR. Further, the Region retains all risks as feedstock (waste) provider, and any further risks related to the Region's integrated waste management system that are beyond the scope of the Project.

**Table 5: Broad Risk Categories and Allocations**

Risks Transferred to DBOM Proponent	Residual Risks Retained by Co-owners	Risks Shared between DBOM Proponent and Co-owners
Design and technology risks	Project planning and scope change risks	Force majeure
Construction risks	Environmental assessment risks	Certain site approval risks
Operating risks	Procurement risks	
Maintenance risks	Siting risks	
Concession risks	General labour risks	
External market risks	Strategic partnership risks	

**Table 6** summarizes the allocation/degree of quantified risks to the Co-Owners and the Design Build Operate and Maintain. Risk allocations are estimated both if the Region were to undertake the Project as sole owner or in a joint venture with EPCOR.

**Table 6: Quantified Stakeholder Risk Allocations (Net Present Value)  
(With and Without the Recommended EPCOR Joint Venture)**

<b>Risks</b>	<b>Region Sole Ownership (\$ million)</b>	<b>Joint Venture with EPCOR (\$ million)</b>
<b>Total Preliminary Quantification of Risks</b>	<b>300</b>	<b>289 - 294</b>
Risks Transferred to Design Build Operate and Maintain Vendor	168	163 - 164
Risks retained by Owner:		
Region (As Owner & Feedstock provider)	132	69 - 96
EPCOR	Not applicable	33 - 57

Notes:

- 1) The cost range in the table is based on change-in-law risk which is still subject to ongoing joint venture negotiations.
- 2) The allocation and quantification of risks are subject to change, as cost components change and/or risk mitigation measures are designed, refined and included within contractual agreements to reduce exposure.