

Citywide Greenhouse Gas Reduction Strategy through Blending Renewable Natural Gas and Natural Gas, a Low-carbon Fuel Option

Date: June 17, 2020

To: Infrastructure and Environment Committee

From: General Manager, Solid Waste Management Services

Wards: All

SUMMARY

The purpose of this report is to provide an update on Solid Waste Management Services (SWMS) renewable natural gas projects underway, detail the recommended renewable natural gas strategy whereby all the RNG is retained and used by the City of Toronto including options for its agencies, boards and corporations to use, and seek authority to enter into any agreements necessary to execute this strategy, thus taking concrete actions towards advancing the City's TransformTO reduction targets.

In 2016, City Council granted the General Manager, Solid Waste Management Services, delegated authority to enter into Renewable Natural Gas (RNG) Projects and agreements. Further to this authority, in 2019, City Council also granted the General Manager, Solid Waste Management Services delegated authority to negotiate and enter into any new agreements, amendments of existing agreements, or acknowledgements, including on the basis of a non-competitive procurement under Municipal Code Chapter 195, Purchasing, necessary in connection with the efforts to produce, manage, market, distribute, use and sell RNG and other environmental attributes associated with RNG production.

In 2019, City Council declared a Climate Emergency and adopted a stronger emissions reduction target for Toronto – net zero by 2050 or sooner. As a result, Solid Waste Management Services has shifted its focus from the sale of RNG to a third party consumer, to addressing Council's declaration and implementing a program that leverages closed loop innovation towards TransformTO's Greenhouse Gas (GHG) reduction targets.

RECOMMENDATIONS

The General Manager, Solid Waste Management Services, recommends that:

1. City Council direct that Renewable Natural Gas (RNG) produced at the Dufferin and Disco Road Organic Processing Facilities be delivered by Solid Waste Management Services via the local gas utility distribution company for distribution to all enrolled City gas accounts under the City Natural Gas Purchasing Program managed by the Environment and Energy Division and to those enrolled accounts for City's agencies, boards and corporations that elect to purchase RNG, at a cost per cubic meter not to exceed the amounts required to fully recover all RNG capital and operating costs.
2. City Council direct City Divisions to include funding in all applicable 2021 and forward Operating Budgets to reflect the fully recoverable incremental costs for acquiring and consuming the Renewable Natural Gas (RNG).
3. City Council direct that all capital and operating costs for the Renewable Natural Gas (RNG) program incurred by Solid Waste Management Services calculated on a full cost recovery basis are to be funded through the general tax rate/utility rate, as proportionally required, and not funded by the Solid Waste Management Services Rate Budget except for Solid Waste Management Services proportional allocation of the RNG and natural gas blend.
4. City Council direct the General Manager, Solid Waste Management Services, to report annually through the budget process to Council on the actual production and operating costs and to report out annually on the Renewable Natural Gas (RNG) program.
5. City Council direct the City Manager or designate to direct the terms and conditions to apply to the delivery, receipt and payment for all Renewable Natural Gas (RNG) to facilitate advancing the above recommendations and to negotiate and enter into any agreement(s) to advance the above recommendations on terms satisfactory to the City Manager or designate and in a form satisfactory to the City Solicitor.
6. City Council direct the General Manager, Solid Waste Management Services, to seek federal and provincial funding for the Solid Waste Management Renewable Natural Gas strategy.
7. City Council direct that any funding obtained through Recommendation 6 be allocated to offset the overall Renewable Natural Gas program costs.

FINANCIAL IMPACT

Solid Waste Management Services (SWMS) proposes that the Renewable Natural Gas (RNG) produced at its Organics Processing Facilities be blended with Natural Gas (NG) consumed by the City, in order to realize environmental benefits of a low carbon fuel blend of RNG/NG and lower GHG emissions across the City.

This report recommends that the related capital and operating expenses, be recovered from the property tax base, by way of an incremental RNG fee applied to consuming City Divisions, to ensure a net-zero impact to the Solid Waste Management Rate. The current estimated rate the City will fund SWMS is \$0.84 per cubic meter to produce RNG from the Dufferin Organics Processing Facility. This cost will be incorporated into the overall cost of the 50M cubic meter of NG normally consumed by the City annually (excluding ABCs). This approach results in an estimated incremental cost of \$0.0415 per cubic meter, and will avoid the emission of 9,356 tCO₂e of greenhouse gases per year when calculated on a lifecycle basis.

The all-in rate of conventional NG, including distribution and carbon pricing, that the City paid was \$0.2267 per cubic meter in 2019. By incorporating the Dufferin RNG and introducing a 6.76% renewable content in natural gas supply the annual impact to the City [excluding Agencies, Boards and Corporations (ABCs)] would be \$2.07 million or a new blended rate of \$0.2682 per cubic meter. Incorporating both Dufferin and Disco Road RNG (to be commissioned in 2022) achieves a 15.98% renewable content with an annual impact to the City [excluding ABCs] of \$4.8M or an increase of \$0.0980 per cubic meter bringing the blended rate to \$0.3247 per cubic meter. Once Disco Road RNG is commissioned the City will avoid a total of 22,115 tCO₂e of greenhouse gases per year when calculated on a lifecycle basis across the two locations.

Table 1 Project Financial Impacts [excluding ABCs]

RNG Project	2019 Enbridge Price (¢/m³)	City bulk purchase (m³)	Estimated price with RNG blended in to City purchase (¢/m³)*	Estimated Annual Impact (\$)*
Dufferin	22.67	50,000,000	26.82	\$2.07M
Dufferin+ Disco Road			32.47	\$4.80M

* Figures to be adjusted based on actual system performance.

The Chief Financial Officer and Treasurer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

At its meeting on December 17, 2019, City Council adopted Item EX11.3 entitled "2020 Rate Supported Budgets - Solid Waste Management Services and Recommended 2020 Solid Waste Rates and Fees", and authorized the Chief Financial Officer and Treasurer and the General Manager, Solid Waste Management Services and/or designate, to negotiate and enter into any new agreements, amendments of existing agreements, or acknowledgements, including on the basis of a non-competitive procurement under Municipal Code Chapter 195 (Purchasing), necessary in connection with the efforts to

produce, manage, market, distribute, use and sell Renewable Natural Gas and other environmental attributes associated with Renewable Natural Gas production on terms and conditions satisfactory to the General Manager, Solid Waste Management Services and each in a form satisfactory to the City Solicitor and the Executive Director, Corporate Real Estate Management.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.EX11.3>

At its meeting on October 2, and 3, 2019, City Council adopted Item MM10.3 entitled "Declaring a Climate Emergency and Accelerating Toronto's Climate Action Plan". City Council endorsed a net zero greenhouse gas emissions target that is in line with keeping global average temperature rise below 1.5 degrees Celsius, immediately strengthening Toronto's goal of becoming net zero before 2050, and City Council requested the Director, Environment and Energy to report back by the fourth quarter of 2020 on the feasibility of actions that could achieve net zero by 2040.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.MM10.3>

At its special meeting on March 7, 2019, City Council adopted item 2019.EX2.3 - 2019 Rate Supported Budgets - Solid Waste Management Services and Recommended 2019 Solid Waste Rates and Fees without amendments. This included exempting Solid Waste Management Services from the City's Carbon Credit Policy, as it relates to any or all environmental attributes under the renewable natural gas initiative. City Council also directed the net revenue derived from the future sale of renewable natural gas and/or any associated environmental attributes generated be directed to the Solid Waste Management Reserve Fund XR1404 for the exclusive use of Solid Waste Management Services, which will be used to fund projects identified within the Council approved Long Term Waste Management Strategy and other environmentally sustainable initiatives.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.EX2.3>

At its meeting on December 13, 14 and 15, 2016, City Council adopted Item PE15.1 entitled, "TransformTO: Climate Action for a Healthy Equitable, and Prosperous Toronto". City Council directed City Divisions, Agencies and Corporations with support from the Chief Corporate Officer, to develop business cases as part of the 2018 Budget Process to support the implementation of the strategies outlined in the TransformTO Short-term Strategies, set out in Attachment A to the report (November 2, 2016) from the Chief Corporate Officer.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.PE15.1>

At its meeting on December 13, and 14, 2016, City Council adopted Item EX20.23 entitled "2017 Rate Supported Budgets - Solid Waste Management Services and Recommended 2017 Solid Waste Rates". To inform the 2018 Rate Supported Budget process, City Council directed the General Manager, Solid Waste Management

Services, to report back to the Budget Committee in the second quarter of 2017 on the next steps for developing a third anaerobic digester to process organic waste, given the business case for planning and securing additional capacity with an earlier timeline due to potential Provincial/Federal funding programs, maturation of multi-residential Green Bin Program, and long-term contract opportunities to accept organic waste from private entities and other municipalities.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.EX20.23>

At its meeting on June 7, 8 and 9, 2016, City Council adopted Item PW13.8 entitled "Authority to Enter into Renewable Natural Gas Projects". City Council authorized the General Manager, Solid Waste Management Services, to enter into Renewable Natural Gas Projects and agreements on such terms that are satisfactory to the General Manager, Solid Waste Management Services, based on the environmental/business case presented in Attachment 1 to the report (April 29, 2016) from the General Manager, Solid Waste Management Services and in a form satisfactory to the City Solicitor, and that the General Manager, Solid Waste Management Services be authorized to execute these projects up until December 31, 2021.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.PW13.8>

At its meeting on April 28 and 29, 2008, City Council adopted Item GM13.11 entitled "Natural Gas Supply Arrangements". City Council authorized the Chief Corporate Officer to execute new or amending gas transportation agreements, new or amending master agreements with gas suppliers, new or amending master services and gas delivery agreement(s) with Enbridge Gas Distribution Inc. and new or amending agency agreements with the Toronto Community Housing Corporation and the City's participating agencies, boards and corporations, all as required, on terms and conditions satisfactory to the Chief Corporate Officer and the City Solicitor.

The City Council Decision document can be viewed at:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2008.GM13.11>

COMMENTS

On October 2, 2019, City Council voted unanimously to declare a Climate Emergency and adopted a stronger emissions reduction target for Toronto, net zero by 2050, therefore accelerating and strengthening its TransformTO goals.

TransformTO is Toronto's climate action strategy, unanimously approved by City Council in July 2017. It lays out a set of long-term, low-carbon goals and strategies to reduce local greenhouse gas emissions and improve our health, grow our economy, and improve social equity.

Toronto's greenhouse gas (GHG) emissions reduction targets, based on 1990 levels:
-30 per cent by 2020
-65 per cent by 2030

-Net zero by 2050, or sooner

The City of Toronto, Solid Waste Management Services (SWMS) Division produces biogas from processing Organics (formerly referred to as Source Separated Organics or SSO) collected through the Green Bin Program in the City-owned Organics Processing Facilities. One of the main components of the biogas produced is methane, also the main component of natural gas (NG). The biogas can be refined into Renewable Natural Gas (RNG), a carbon-neutral, if not carbon-negative fuel. RNG production has been a strategic priority for SWMS as an opportunity to advance Toronto City Council's aspirational circular economy goals. RNG projects enable SWMS to adopt a closed loop approach that allows for local organics management, whereby organics collection trucks can ultimately be powered by the waste product they collect.

Since 2015, SWMS has been working closely with Enbridge Gas Inc. (EGI) and other stakeholders to develop its RNG infrastructure. The first RNG facility is being built at the Dufferin Organics Processing Facility and will produce 3.380 million cubic meters of RNG by fall 2020. A second proposed RNG facility (in early development) at the Disco Road Organics Processing Facility is expected to produce 4.609 million cubic meters of RNG by 2022.

The City consumes 50,000,000 cubic meters of NG annually, and the Agencies, Boards and Corporations (ABCs) consume an additional 60,000,000 cubic metres of NG annually, with a combined total consumption of 110,000,000 cubic metres annually.

SWMS proposes the RNG produced at Dufferin, and eventually Disco Road, be blended with the NG purchased by the City to move the City to a lower-carbon RNG/NG blend to advance towards the TransformTO goals. It is also proposes that the City purchase all the RNG produced from SWMS on a full cost recovery basis. This proposal will enable the City to demonstrate its leadership in advancing circular economy and climate action. Through investments in circular economy approaches, Toronto can leverage innovation in waste management to achieve significant environmental benefit across the full municipal government operation.

When the City reduces its bulk purchase of NG by the RNG volume produced at Dufferin (3.380 million cubic meters) and blends the RNG and NG, a 6.67% blend of RNG/NG would be achieved. Further, if the City reduces its bulk purchase of NG by the RNG volume produced at Disco Road in 2022 (est. 4.609 million cubic metres), an RNG/NG blend of 15.98% would be achieved.

Should the ABCs choose to participate in the RNG strategy, blends of 3.07% (Dufferin only) and 7.26% (Dufferin and Disco) could be achieved City wide. The process of blending the RNG with the NG would allow for the City as a whole to benefit by moving toward a lower-carbon fuel blend.

The Environment and Energy Division (EED) manages the Natural Gas Purchasing Program on behalf of the City and its ABCs and Toronto Community Housing. The program is well-established with a roster of wholesale vendors to provide the delivery of natural gas to the Enbridge franchise system. The program also has all necessary agreements in place with Enbridge to provide local delivery and distribution services.

These existing agreements between the City and Enbridge can be extended to include RNG as part of the program and eliminate the need for another set of agreements which Enbridge does not support. Under the program, the City sets the commodity price for natural gas purchased and will set the price for RNG produced by SWMS at a cost per cubic meter not to exceed the amounts required to fully recover all RNG capital and operating costs for a maximum 15 year period incurred by SWMS. For this reason, SWMS recommends that Council direct EED to include RNG produced by SWMS as part of its purchasing program.

Table 2 below illustrates the potential benefits of the projects, once commissioned.

RNG Project Numbers	Dufferin	Disco Rd.
Commissioning Year	2020	2022
RNG Production Volume (m3)	3,380,256	4,609,440
RNG Production Volume (GJ)	128,450	175,159
GHG Emissions Reductions(*) (tCO2e)	9,356	12,759
Renewable Energy Blend Over 50M m3	6.67%	15.98%
Renewable Energy Blend Over 110M m3	3.07%	7.26%

Table 2 RNG Project Numbers Breakdown

(*) Estimated by SWMS Staff

The production of RNG from biogas has an environmental benefit of "closing the carbon loop" by avoiding the current practice of flaring the biogas produced during the anaerobic digestion process, cleaning up the biogas to RNG pipeline quality and displacing fossil fuel with green fuel. The project specific reductions on a lifecycle GHG emissions basis will be 9,356 and 12,759 tonnes CO2e per year at the Dufferin and Disco Road RNG facilities, respectively. The gigajoules of energy produced by the Dufferin and Disco RNG facilities will enable the City to reach 19.6% of the TransformTO goal of generating 1.5 million gigajoules of energy from biogas by 2030.

At a special meeting on March 7, City Council exempted SWMS from the City's Carbon Credit Policy, as it relates to any or all environmental attributes under the RNG initiative. Council also directed the net revenue derived from the future sale of RNG and/or any associated environmental attributes generated be directed to the SWMS Reserve Fund XR1404 to be used exclusively by SWMS to fund projects identified within the Council approved Long Term Waste Management Strategy and other environmentally sustainable initiatives.

SWMS intends to hold any unsold environmental attributes associated with the renewable natural gas. In the event that SWMS decides to sell attributes being held, it will be done on a right of first refusal basis to the City and the price will reflect the market rate at the time of sale. Should the City choose to exercise its right of first refusal, SWMS will look to sell the attributes on the voluntary market. Any sale of the attributes on the voluntary market will be done for the sole purpose of retiring those attributes or credits.

Toronto has been recognized internationally for its work to advance circular economy through RNG. The Dufferin RNG project received the 2018 Energy Vision Leadership Award for its contribution to reducing global dependence on fossil fuel. The City also was selected as a finalist for the 2019 Circulars Award, as well as profiled in the C40 publication of municipally-led circular economy case studies and the Ellen MacArthur Foundation's Circular Economy in cities case studies. Toronto was also selected to be profiled in the upcoming 2020 Global Smart Solutions Report.

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SIGNATURE

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ATTACHMENTS

Attachment 1 – Proposed Renewable Natural Gas Citywide Strategy Financials