

Proposed Wastewater Energy Transfer Pilot Projects

Date: August 19, 2019
To: Infrastructure and Environment Committee
From: General Manager, Toronto Water
Wards: All

SUMMARY

The purpose of this report is to provide recommendations on the advancement of strategic pilot projects for wastewater energy transfer as requested by City Council with its adoption of Notice of Motion MM9.13 at its meeting on July 16, 2019 and to seek authority to proceed with two wastewater energy transfer pilot projects with Noventa Energy Partners Inc. ("Noventa") as set out in this report. It is intended that the outcome of these two pilot projects will serve to inform the future development by staff, and a further report back in 2020, of a wastewater energy transfer policy as also requested by City Council.

RECOMMENDATIONS

The General Manager, Toronto Water recommends that:

1. City Council authorize the implementation and monitoring of two wastewater energy transfer pilot projects with Noventa Energy Partners Inc. ("Noventa") (the "Pilot Projects") on the following conditions:

a) The General Manager, Toronto Water, in consultation with the Director, Environment and Energy, and the City Solicitor, be authorized to implement, conduct, administer and monitor the Pilot Projects including the authority to develop all related procedures, and to negotiate, enter into and execute any agreement(s) necessary to give effect to the Pilot Projects, or any one of them, including any amendment, renewal or extension thereof, on terms and conditions acceptable to the General Manager, Toronto Water and in a form acceptable to the City Solicitor.

b) The Pilot Projects be undertaken by Toronto Water for a minimum of two years and that any access to the City's sewer infrastructure for the purposes of the Pilot Projects, and, specifically, access to the excess waste heat (thermal energy)

generated by the City's wastewater distribution system provided to Noventa be limited to support only the Sunnybrook Hospital and the Humber College, North Campus, at HWY 27/Finch Ave. locations.

c) The General Manager, Toronto Water, is satisfied that the Pilot Projects, or any one of them, are technically feasible.

d) An energy transfer fee for such access, the basis and amount of which is to be determined by the General Manager, Toronto Water, is paid to Toronto Water by Noventa for the duration of the Pilot Projects.

e) Any related capital and operating costs associated with the installation, operation and maintenance of the wastewater energy transfer systems needed for the Pilot Projects are at Noventa's expense.

f) Any risk of the Pilot Projects is assumed by Noventa and, specifically, that any access is provided by the City on an "AS IS" and "WHERE IS" basis with no guarantee of an energy supply.

g) The General Manager, Toronto Water report back to the Infrastructure and Environment Committee on the outcome of the Pilot Projects and the development of a wastewater energy transfer policy as requested by City Council.

2. In the event the Pilot Projects are successful, as determined by the General Manager, Toronto Water, in the General Manager's sole discretion, City Council further authorize the General Manager, Toronto Water, in consultation with the Director, Environment and Energy, and the City Solicitor, to extend the term of any agreement for the Pilot Projects with Noventa, as referenced in Recommendation 1.a. above, to allow the Pilot Projects, or anyone of them, to continue beyond the initial duration of the Pilot Projects, on terms and conditions acceptable to the General Manager, Toronto Water, and in a form acceptable to the City Solicitor.

FINANCIAL IMPACT

There will be no financial cost to the City of Toronto as a result of the Pilot Projects. It is currently estimated that the proposed energy transfer fee will generate a net revenue of approximately \$75,000 to Toronto Water. In addition, there will be significant non-tangible benefits besides paving the way for numerous additional projects for wastewater energy transfer likely resulting in additional revenues to the City.

Any financial and other benefits will be assessed once pilot projects become operational and reported back to Council.

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

DECISION HISTORY

At its meeting on July 16, 2019, City Council adopted Notice of Motion MM9.13 entitled "Supporting Wastewater Energy Transfer in Toronto" made by Councillor Layton, supported by Mayor Tory, requesting this report back. This motion can be viewed at:

<https://www.toronto.ca/legdocs/mmis/2019/mm/bgrd/backgroundfile-135766.pdf>;

In adopting the motion, City Council directed the General Manager, Toronto Water, in consultation with the Director, Environment and Energy and the City Solicitor to report back to City Council on October 2 and 3, 2019, through the Infrastructure and Environment Committee, with recommendations on how to advance strategic pilot projects for wastewater energy transfer in the fourth quarter of 2019.

City Council further directed the General Manager, Toronto Water to use the information from these pilot projects, to report back to City Council, through the Infrastructure and Environment Committee, in the third quarter of 2020, to develop recommendations for a wastewater energy transfer policy.

COMMENTS

The City of Toronto is committed to an ambitious climate change strategy through TransformTO. As part of the City's commitment to meet the objectives of TransformTO, the Green Market Acceleration Program was established to support the development of new renewable energy technologies.

Toronto Water manages the largest water and wastewater system in Canada, and represents approximately 50% of the total electricity and over 25% of the total natural gas consumption from City of Toronto operations. As the City's largest energy user, Toronto Water has actively sought to implement capital projects and operational changes to improve energy efficiency while still meeting its primary mandate to provide quality water and wastewater services. In 2016, a comprehensive energy optimization plan was developed by Toronto Water, which set the framework to meet the mission of optimizing energy utilization by leveraging innovative technologies, processes and procedures in an environmentally sustainable, operationally reliable and fiscally responsible manner. One of the key recommendations of this plan was to investigate the opportunities for energy recovery from wastewater.

Wastewater contains recoverable heat compared with ambient water sources. It offers opportunity to use the recovered heat as a direct substitute for natural gas. This technological process of using energy from wastewater has been successfully applied in Europe for many years, and has gained popularity in North America in the last 10-15 years. Some examples in Canada include the Whistler Winter Olympics Village and Saanich Peninsula (British Columbia), the Southeast False Creek Neighbourhood Energy Utility in Vancouver (British Columbia) and the Green Thermal Utility at Halifax Water (Nova Scotia). By utilizing thermal energy in this way, among other things, it may be possible to heat and cool buildings across the City thereby displacing the use of

fossil fuels resulting in a reduction of regional greenhouse gas emissions and advancing the City's climate change goals.

In consideration for access to the City's sewer infrastructure for the purposes of the proposed pilot projects, and, specifically, access to the excess waste heat (thermal energy) generated by the City's wastewater distribution system, the City would be paid an energy transfer fee by Noventa for the duration of the pilots. Any related capital and operating costs associated with the installation, operation and maintenance of the wastewater energy transfer systems would also be at Noventa's expense. This report further recommends that the General Manager, Toronto Water, in consultation with the Director, Environment and Energy, and the City Solicitor, be delegated the authority to negotiate and enter into the necessary access agreements to give effect to these pilot projects on terms and conditions which will protect the City's interests and further advance the City's climate change strategies and the objectives of the City's TransformTO program through the development of new renewable energy technologies reinforcing Toronto as a global leader in the renewable energy field and a hub of technological innovation.

In furtherance of the City's commitment to pursuing strategies that mitigate climate change, and Toronto Water's initiative to investigate the opportunities for energy recovery from wastewater, this report recommends that City Council authorize staff to proceed with the Pilot Projects which would then serve as a basis for the future development of a wastewater energy transfer policy as requested by City Council.

Noventa has approached the City and represented that it has developed a patented technology used to harvest thermal energy recovery from wastewater which it advises can be used to produce low-carbon heating and cooling to building systems. Specifically, Noventa has asked for access to portions of the City's sewer system for the purposes of supplying chilled water, hot water and condenser water to Sunnybrook Health Sciences Centre and Humber College to demonstrate the viability of its technology for this renewable energy purpose. For the proposed supply of energy to the hospital, Noventa has advised City staff that it has some of the infrastructure already in place including an energy transfer station located on Sunnybrook Hospital lands to facilitate the project. However, it will have to install other infrastructure; for example, a wetwell and an underground pipe and obtain all necessary approvals, which it will do at its own cost. As it relates to the proposed Humber College location, in addition to installation of a wetwell (and supporting infrastructure) and obtaining all necessary approvals, Noventa would need to construct an energy transfer station on City lands, also at its own cost. To this end, Noventa is in the early stages of potential lease discussions with the City's real estate division in an effort to secure the lands necessary for the proposed project.

Once operational, the Pilot Projects will be used to assess the following:

- whether such projects are technically feasible and sustainable with no operational impact to the City;
- whether there are any associated environmental risks arising from such projects;
- whether there is a net financial benefit to Toronto Water;

- whether such projects sufficiently advance the City's climate change strategy and/or other strategic interests; and,
- the basis for the development of a wastewater energy transfer policy including future pilot projects.

In addition, the Pilot Projects will also provide significant benefits as follows:

- demonstrating Toronto as a global leader in the renewable energy field and a hub of technological innovation; and
- paving the way for numerous additional projects for wastewater energy transfer resulting in additional revenues to Toronto Water.

In the event that the Pilot Projects, or any one of them, are successful, this report further recommends that the General Manager, Toronto Water, be authorized to extend the term of the agreement(s) with Noventa beyond the duration of the initial pilot(s) so to enable the continuation of the project(s), and the benefits derived therefrom.

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SIGNATURE

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