



Report of the Commissioner of Public Works

Wastewater Energy Transfer Agreement with Markham District Energy Inc.

1. Recommendations

1. Council authorize the Commissioner of Public Works to negotiate and execute an agreement with Markham District Energy Inc. to implement a wastewater energy transfer system at 8100 Warden Avenue, Markham, subject to the terms and conditions set out in Private Attachment 1, and on business terms satisfactory to the Commissioner of Public Works and on legal terms satisfactory to the Regional Solicitor.
2. Commissioner of Public Works be authorized to execute any future extensions or amendments that may be required.

2. Purpose

This report seeks Council authorization for the Commissioner of Public Works to execute a Wastewater Energy Transfer agreement with Markham District Energy Inc. to allow it to connect to the York Durham Sewage System to conduct energy exchange with wastewater. This innovative partnership will enable Markham District Energy to significantly reduce natural gas consumption and associated greenhouse gas emissions by extracting heat from wastewater in colder months and injecting heat into wastewater in warmer months.

Attachment 1 is private pursuant to subsections 239(2)(i), (h) and (k) of the *Municipal Act*, 2001. It contains confidential commercial and financial information supplied in confidence to the municipality or local board, which, if disclosed, could reasonably be expected to prejudice significantly the competitive position or interfere significantly with the contractual or other negotiations of a person, group of persons, or organization, and a position, plan and instruction to be applied to any negotiations carried on by the municipality.

Key Points:

- Markham District Energy Inc. has proposed a connection to a small section of the York Durham Sewage System for implementation of a wastewater energy transfer system
- The project would support further decarbonization of Markham District Energy Inc.'s systems, which serve heating and cooling needs for participating buildings in Markham Centre
- If approved by Council, the agreement between York Region and Markham District Energy Inc. proposes a 30-year contract term and will contain provisions to safeguard York Region's assets and processes
- By supporting this project, York Region is enabling the largest wastewater energy transfer project in North America, reducing annual community greenhouse gas emissions by up to 30,000 tonnes, equivalent to annual emissions from 5,500 cars or greenhouse gas absorption by a forest 15% the size of Markham

3. Background

Wastewater energy transfer supports York Region's Climate Change Action Plan

Markham District Energy Inc. is a district energy utility wholly owned by the City of Markham. The company operates a heating and cooling network that serves approximately 14 million square feet of residential and commercial space in Markham Centre.

As outlined in the [2021 Corporate Energy Report](#), Markham District Energy Inc. and York Region entered into a Memorandum of Agreement to advance implementation of a wastewater energy transfer system through Markham District Energy Inc.'s existing district energy system. This innovative partnership demonstrates collaboration between York Region and a local municipal entity to leverage a source of renewable energy toward reducing community greenhouse gas emissions in line with York Region's Climate Change Action Plan.

Similar to air source heat pumps used in homes, this proposal uses water source heat pumps to deliver low-carbon and cost-effective heating and cooling

Wastewater energy transfer uses heat pump technology to exchange heat energy with wastewater to enable a low-carbon and cost-effective heating and cooling solution. Markham District Energy Inc. has proposed a connection to a section of York Region's trunk sewer at 8100 Warden Avenue.

The proposed project would involve diversion of wastewater flows to an adjacent facility that contains heat exchangers to transfer heat from one source to another. The process would involve extracting heat from wastewater in colder months and injecting heat into wastewater in warmer months.

Proposed wastewater energy transfer project is currently the largest in North America with completion scheduled for 2026

The proposed wastewater energy transfer project supports goals in York Region's [Climate Change Action Plan](#) by reducing community greenhouse gas emissions and is currently projected to be the largest wastewater energy transfer system in North America. Unlike initiatives highlighted in the annual Corporate Energy Report that directly reduce York Region's corporate greenhouse gas emissions, this project would result in a significant reduction of community greenhouse gas emissions.

Markham District Energy Inc. and its contractors have significant global experience in district energy and wastewater energy transfer systems

Markham District Energy Inc. has 23 years of experience operating district energy systems. They currently operate two district energy systems in Markham and have contracted two reputable service providers, Noventa and R.V. Anderson, to support successful delivery of the project.

Noventa, in partnership with HUBER Technology, is the supplier of wastewater energy transfer equipment. HUBER Technology has more than 175 years of global experience in manufacturing and operating wastewater equipment. R.V. Anderson is the engineering technical consultant for the proposed connection to York Region's sewer and has 75 years of experience in engineering design. Noventa and R.V. Anderson are engaged in a similar project in Toronto to design and construct a smaller Wastewater Energy Transfer system for the Toronto Western Hospital.

Project demonstrates York Region's commitment to facilitating community greenhouse gas emission reductions in line with federal and provincial mandates

Bill C-12 passed in 2021, legislating Canada's commitment to achieve net-zero carbon emissions by 2050. Canada has set ambitious interim national targets to reduce greenhouse gas emissions, which will require participation from all levels of government, industry and individual Canadians. York Region's enablement of the proposed project demonstrates a commitment to advance innovative solutions, supports economic development in the clean-tech sector, and helps Canada achieve progress towards net-zero carbon emissions by 2050.

4. Analysis

Agreement with Markham District Energy will reduce community greenhouse gas emissions in York Region

Wastewater energy transfer is an emerging industry across Europe and North America. While not the first project of its kind in Canada, if approved, the project is expected to be the largest wastewater energy transfer project in North America.

Terms of the proposed Agreement include:

- 30-year contract term from April 1, 2026, through April 1, 2056, to provide Markham District Energy Inc. access to the Region's wastewater for energy transfer with the option to extend the contract by two additional 10-year terms based on mutual agreement from both parties. The initial 30-year term is based on the forecasted life cycle of corresponding equipment
- York Region's responsibility would be to provide access to the Region's wastewater main at 8100 Warden Avenue in Markham. York Region will not make representation or warranty as to the volume, quality, temperature or chemistry of the wastewater or as to the operation, maintenance or condition of the wastewater system, including the sewer
- Agreement would contain provisions to safeguard York Region against legal implications and protect assets and processes against risks to infrastructure and operations. These provisions include communication and dispute resolution plans
- Provisions to isolate Regional infrastructure from the wastewater energy transfer system will be incorporated in the design and construction of the project in the event of such operational needs
- A connection fee and thermal energy transfer revenue would be received by the Region from Markham District Energy Inc. to offset Regional costs for enabling the project. These costs include technical design review to minimize operational risks to the Region's assets and ongoing infrastructure inspections throughout the term of the agreement to monitor exit and entry points on York Region's infrastructure where sewage is being diverted for energy exchange
- Agreement does not imply exclusivity with Markham District Energy Inc. and maintains York Region's opportunity to collaborate with other service providers within other local municipalities

York Region is securing technical and legal support from internal and external partners to expedite review processes and ensure a successful project

Regional staff are collaborating with Markham District Energy Inc. and its consultants to identify and minimize anticipated operational and infrastructure risks. Public Works, Legal, and Risk staff have provided input into negotiation of business terms within the proposed agreement. To develop the agreement with Markham District Energy Inc., staff reviewed precedent cases from Toronto and Ottawa.

In addition, staff have engaged external legal counsel and an engineering consultant to assist with technical reviews and contract negotiations to support advancement of this innovative project. In alignment with terms outlined in the 2021 Memorandum of Agreement between the parties, associated costs to complete this necessary work are being reimbursed by Markham District Energy Inc.

Infrastructure and ongoing operation of the proposed wastewater energy project has no impact to capital plans for northern York Durham Sewage System

The wastewater energy transfer project with Markham District Energy Inc. will be connected to a southern portion of York Durham Sewage System (YDSS). Staff have analyzed proposed infrastructure plans required for expansion of northern YDSS and confirm there are no impacts to timing or construction of proposed infrastructure.

Proposed wastewater energy transfer project strives to achieve a more sustainable environment identified in York Region's Strategic Plan

The wastewater energy transfer project supports the strategic objective of delivering and promoting environmentally sustainable services by reducing community greenhouse gas emissions and promoting wastewater as a low-carbon energy transfer medium.

5. Financial Considerations

Revenues from this project include an energy transfer fee, proceeds from sharing cost avoidance from lower utility consumption, and potential future sale of carbon credits

Markham District Energy Inc. is responsible for all project costs, including third-party consulting expenses up to commercial operation (anticipated to be no later than April 1, 2026).

Anticipated ongoing Regional operating costs associated with the project over the 30-year contract term are proposed to be recovered through an energy transfer fee. The Region has an opportunity to generate revenue through a share of Markham District Energy Inc.'s avoided costs (electricity, natural gas and water) and potential future monetization of carbon credits. Staff have proposed a framework that contemplates future changes to the monetization of carbon should upper levels of government move away from the current Carbon Tax program.

Additional financial considerations under negotiation are outlined in Private Attachment 1.

6. Local Impact

The wastewater energy transfer project offers means to accelerate community greenhouse gas reductions in York Region through a partnership with an experienced third-party service provider and their existing energy and customer network. This initiative is forecasted to reduce annual community greenhouse gas emissions in Markham by up to 30,000 tonnes, equivalent to annual greenhouse gas emissions absorbed by a mature forest approximately 15% of the size of Markham or annual emissions of 5,500 cars. The project builds local expertise in wastewater energy transfer, supports economic development in Markham and provides a basis for future projects in other local municipalities.

7. Conclusion

This report seeks Council authorization to enter into an agreement with Markham District Energy Inc. for access to York Region's wastewater main at 8100 Warden Avenue in Markham. An executed agreement between Markham District Energy Inc. and York Region is required for staff to proceed with the final design, construction and operation of the proposed wastewater energy transfer system.

If approved, this agreement will come into effect during the pre-operation period, with full commercial operations planned for no later than 2026. Staff will update Council at key milestones.

For more information on this report, please contact David Szeptycki, Director, Sustainability, Communications and Innovation at 1-877-464-9675 ext. 75723. Accessible formats or communication support are available upon request.

Recommended by:



Laura McDowell

Commissioner of Public Works



Approved for Submission:

Erin Mahoney

Chief Administrative Officer

February 13, 2024

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Private Attachment #1 – Agreement Terms and Financial Considerations (15964600)