

Recommendations to Toronto Hydro on Climate Action

Date: March 16, 2021
To: Executive Committee
From: City Manager
Wards: All

SUMMARY

This report responds to City Council direction from October 27, 2020 that the City Manager, in consultation with the Environment and Energy Division (EED) and the Toronto Atmospheric Fund (TAF), develop recommendations for Toronto Hydro to achieve greater outcomes for energy efficiency, demand management and renewable energy.

The City of Toronto's climate goals are outlined in its TransformTO Climate Action Strategy adopted unanimously by Council in 2017. In 2019, Council declared a Climate Emergency and updated its greenhouse gas (GHG) emission reduction targets to achieve net zero emissions by 2050 or sooner.

Accelerating climate action is essential for the health and prosperity of Toronto and requires all City divisions, agencies and corporations to advance this work. Toronto Hydro, as the City's wholly-owned electrical distribution company, is uniquely placed to enable TransformTO goals, given the significant GHG reductions that can be realized through electrification.

This report recommends that Toronto Hydro report back by the end of Q3 2021 with an action plan on several key opportunities. Toronto Hydro, TAF and EED have been engaged in preparing this report. Additional input provided by Hydro in a communication dated March 4, 2021 has been referenced in the body of this report and included as Attachment 1.

RECOMMENDATIONS

The City Manager recommends that:

1. City Council request Toronto Hydro to report to the City Manager by the end of Q3 2021 on current work and an action plan, including opportunities for acceleration,

investments, reporting and collaboration with City divisions and agencies to achieve outcomes in the following areas:

- a) electric vehicle-charging infrastructure;
- b) modernization of outdoor lighting, including street lighting;
- c) implementation and facilitation of renewable energy and energy storage; and
- d) attracting revenue through non-rate sources of capital funding, such as grants, funding and financing from governments and agencies, and revenues generated through unregulated affiliates.

2. City Council direct the City Manager to report to Council by the end of Q4 2021 with respect to the report from Toronto Hydro referred to in recommendation 1 of this report.

FINANCIAL IMPACT

There are no financial implications arising from the approval of this report. The financial impacts of specific recommended actions will be included with the report of the City Manager.

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

EQUITY IMPACT

Emerging research suggests that the urban impacts of climate change disproportionately affect certain populations, including seniors, people with health conditions, people with low income, those experiencing homelessness, and Indigenous and racialized communities. In addition to this burden, in Toronto and cities around the world, these communities are facing disproportionate health and economic impacts from the spread of COVID-19 and the consequences of lockdowns.

The recommendations in this report are intended to identify and accelerate actions that Toronto Hydro, in collaboration with City divisions and agencies, can take to mitigate and adapt to climate change and support community resilience. These actions may lead to reduction in greenhouse gases and mitigate the health impacts of extreme weather, air pollution and other consequences of climate change.

DECISION HISTORY

On October 27, 2020, City Council directed the City Manager, in consultation with the Environment and Energy Division and the Toronto Atmospheric Fund, to develop recommendations for Toronto Hydro to achieve greater outcomes for energy efficiency, demand management and renewable energy within the service area, and report back to City Council by the end of 2020 on the proposed recommendations and how to implement them.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2020.EX17.1>

COMMENTS

Toronto's Climate and Environmental Commitments

In October 2019, Toronto City Council unanimously declared a climate emergency, deepening the City's commitment to addressing climate change. As part of the declaration, Council updated the greenhouse gas (GHG) reduction targets in the City's TransformTO Climate Action Strategy to:

- 30% reduction by 2020 (based on 1990 levels)
- 65% reduction by 2030
- Net zero by 2050 or sooner.

TransformTO is Toronto's strategy to reduce local greenhouse gas emissions, increase climate resilience, improve our health, grow our economy, and improve social equity. Toronto's most recent community-wide inventory identifies its three largest sources of GHGs as buildings (52%), transportation (38%) and waste (10%). TransformTO includes the following goals to address these sources and reduce the worst impacts of climate change:

- Homes and buildings: By 2030, all new buildings will be built to produce near-zero GHG emissions. By 2050, all existing buildings will have been retrofitted to achieve net zero emissions.
- Energy: By 2050, 100% of energy will come from renewable or low-carbon sources.
- Transportation: By 2050, 100% of vehicles in Toronto will use low-carbon energy; 75% of trips under 5 km will be walked or cycled.
- Waste Diversion: By 2050, we will have advanced towards a zero waste circular economy.

The City's environmental commitments are also reflected in how it discloses and measures climate risk in its strategic priorities, sustainable finance and socioeconomic outcomes. In January 2021, Toronto became the first government in Canada to issue an annual report on Environmental, Social and Governance (ESG) that outlines key performance indicators to guide City operations and inform decision-making. Enhancing ESG outcomes requires coordination among multiple City strategies, including TransformTO, the HousingTO 2020-2030 Action Plan and financing programs.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.EX20.3>

The City's success in achieving the commitments laid out in TransformTO and its ESG goals depends on detailed measurement and ambitious action by all City divisions, agencies and corporations to change the way we live, work, build and commute.

Toronto Hydro

Toronto Hydro Corporation (Hydro) is a holding company of the City of Toronto incorporated under the *Business Corporations Act* under the authority of the *Ontario Electricity Act, 1998*. The City of Toronto is the sole shareholder. A Council-adopted Shareholder Direction provides Hydro's Board of Directors with the City's fundamental principles regarding its business and sets out the accountability, responsibility and relationship between the Board and the City.

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Toronto Hydro provides corporate and management services, strategic direction, and supervises the operation of its two wholly-owned subsidiaries:

- **Toronto Hydro-Electric System Limited** is a regulated electricity distribution company that delivers electricity to approximately 800,000 residential, commercial, and industrial customers in Toronto and engages in conservation and demand management activities.
- **Toronto Hydro Energy Services Inc.** is a subsidiary that participates in non-regulated businesses including the provision of street lighting and expressway lighting services in Toronto.

Toronto Hydro Climate Action Activities

The Toronto Hydro Shareholder Direction includes requirements to operate in a manner that is consistent with the City's energy, climate change and urban forestry objectives. Hydro collaborates with City divisions and agencies on climate action planning and implementation through City-led committees and working groups such as the Electric Vehicle Working Group, and on infrastructure investments such as electric vehicle charging pilots.

Toronto Hydro's 2019 Environmental Performance Report (<https://www.torontohydro.com/documents/20143/407273/2019-Environmental-Performance-Report.pdf>)

describes a number of accomplishments related to energy efficiency, demand management and renewable energy, including:

- Supported TransformTO's GHG reduction goals by reducing its own GHG emissions associated with its fleet, facilities, line losses and releases of sulphur hexafluoride (SF6) gases, and quantifying the GHG emissions of Hydro-owned and controlled vehicles and facilities.
- Installed electric vehicle charging stations at three Hydro work centres, added fully-electric vehicles to its fleet, and supported the Toronto Transit Commission's adoption of electric buses. In 2020, Hydro and the City installed 17 on-street electric vehicle charging stations across the City for a 12-month pilot.
- Advanced the City's Sustainable Energy Strategy target to reduce electrical system demand by 550MW. Between 2009 and 2019, Toronto Hydro programs helped customers reduce peak demand by a cumulative 408MW.
- Enabled over 2,000 renewable energy connections from customers to the grid between 2009 and 2019, totalling approximately 200MW, representing approximately 38% of the City's 2020 renewable energy generation goal and about 127% of the City's 2020 goal for solar photovoltaic generation.
- Invested in over 70 solar photovoltaic and energy storage projects in City-owned and Hydro-owned facilities.

In Attachment 1, Toronto Hydro provides additional information on its environmental performance, conservation projects, energy storage and partnerships with associations and institutions, and how its work aligns with the City's goals.

Current Context for Ontario's Local Electricity Distribution Companies

The Provincial government has direct authority with respect to energy, including electricity generation, the provincial distribution grid, local distribution and pricing. Electric utilities like Toronto Hydro, known as Local Distribution Companies (LDCs), are monopolies in their service areas whose capital and operating budgets and rates are regulated by the Ontario Energy Board (OEB). LDCs may also have un-regulated subsidiaries, such as Toronto Hydro Energy Services Ltd. Toronto Hydro operates within a provincial system that includes the Independent Electricity System Operator (IESO), which is responsible for Ontario-wide planning, procurement and grid integration, and Hydro One Networks Inc., which is responsible for bulk transmission.

Several recent decisions by the Ontario government have directly impacted the City and Toronto Hydro's energy efficiency, conservation and renewable programs and climate objectives:

- In 2016, the Province withdrew fixed-price contracts for renewable energy, available through programs like Feed-in-Tariff (FIT) and microFIT, which removed key incentives for residential and commercial investment in renewable energy and energy storage projects. A moratorium on offshore wind energy has been in place since 2011.
- In March 2019, the Ontario Minister of Energy, Northern Development and Mines issued a directive that transferred the responsibility for designing and administering Conservation and Demand Management (CDM) programs from LDCs like Toronto Hydro to the IESO, although it allows for a smaller suite of local CDM programs at IESO's discretion. Prior to this directive, from 2015-2019 Hydro secured \$400 million for CDM programming in Toronto to fund over 1.6 billion kWh of energy savings. The directive resulted in the cancellation of Hydro's residential and commercial conservation programs for Toronto customers, including those that supported adaptive thermostats, rebalanced building hydronic systems, lighting retrofits and swimming pool pump upgrades.
- On September 30, 2020, the Minister issued a further directive to the IESO to establish a 2021-24 CDM framework that extended the above-noted budget and program restrictions. IESO retains discretion to procure local CDM programs run by third parties (including LDCs) to meeting local electricity system needs.
- In addition, an Integrated Regional Resource Plan (IRRP) released in 2019 that was developed by the IESO to coordinate electricity planning for the Toronto region did not reflect requests by the City to include the City in IRPP technical working groups, to consider TransformTO targets and neighbourhood-level planning projections on population and employment growth in forecasts of system needs, or coordination across IESO, Hydro and the City to explore potential "non-wire alternatives" such as CDM, storage and renewables to mitigate local and city-wide capacity and infrastructure constraints.

Key Opportunities for Climate Action

The City Manager's Office consulted with the Environment and Energy Division (EED), the Toronto Atmospheric Fund (TAF) and Toronto Hydro to identify opportunities to improve outcomes for energy efficiency, demand management and renewable energy.

TransformTO and other modelling studies conclude that reaching climate targets requires transitioning away from fossil fuels, including the gasoline and diesel used in transportation and the gas used for space and water heating and industrial processes. In Ontario, shifting from the use of carbon-based energy sources to the electricity grid is a critical path to achieving these targets, since our current electricity supply relies on non-carbon fuels such as nuclear, hydroelectric, wind and solar. The City of Toronto, Toronto Hydro and its divisions and agencies, could seek opportunities to advance electrification to achieve our climate targets and realize potential revenues.

In 2019, Torontonians and Toronto's businesses and institutions spent \$3.95 billion on electricity, \$1.62 billion on fossil gas, \$2.17 billion on gasoline and \$150 million on diesel. Investments in electrification now may help realize future sustained revenues for Hydro and the City as its sole shareholder. Preliminary modelling for the City's net-zero commitment predicts that electricity use is expected to grow from its current 28% share of total city-wide energy use to 82% by 2050. This represents an additional 3,000 gigawatt hours of annual electricity delivery and associated revenue potential for Hydro, mostly off-peak and all driven by electrification of transportation and heating.

Conservation and Demand Management (CDM) can help avoid increases in natural gas generation, accommodate planned growth, and create capacity for electrification. Opportunities to leverage staff expertise and economies of scale could support TransformTO objectives, for example through:

- Investing in low-carbon heating systems at the building and/or district scale through affiliates, with a variety of potential business models;
- Proposing local CDM programs or pilots in response to current and future procurements by the IESO; and
- Proposing targeted CDM investments where there is potential to effectively reduce future infrastructure costs and enable development and growth.

Opportunities may exist to propose investments in CDM, renewables, storage or demand response initiatives, should these provide cost-effective alternatives or complement otherwise necessary distribution system upgrades or replacements (known as "non-wire alternatives"). Opportunities to recover these investments, subject to OEB review and approval, could be explored as well.

In addition, the electrification of building heating - which is primarily provided by natural gas today - may have significant implications for electricity consumption. TransformTO includes targets for deep retrofits to all new and existing buildings, such as through installation of, or conversion to, electric heat pumps for space and water heating.

Market conditions, examples from other LDCs and subsidiaries, current and past work, and local community infrastructure and population projections point to several key opportunities that could be considered by Toronto Hydro. This report recommends that Toronto Hydro report to the City Manager this year with an action plan to advance the opportunities below.

1) Electrification of Transportation

TransformTO modelling ranks the electrification of transportation among the actions with the biggest climate impact and that can be achieved using existing technology. EED reports that electric vehicles have advanced significantly in recent years due to technology improvements, increased availability of new and used models and decreasing battery costs.

In support of TransformTO's goal, Toronto should be prepared to accommodate more than 220,000 plug-in electric vehicles (EV) by 2030 and that 100% of transportation use zero-carbon energy by 2050. Council approved an Electric Vehicle Strategy in January 2020 that requests all City divisions, agencies and corporations to engage and implement the strategy. The strategy outlines City actions in four key areas: increasing charging infrastructure, reducing the cost of owning and using EVs, increasing consumer confidence and capturing the economic benefits of a transition to electric mobility. <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2020.IE11.17>

Toronto Hydro plays a critical role in supporting the Electric Vehicle Strategy, and has committed to support on-street charging stations in residential neighbourhoods and public parking facilities, optimizing the grid to accommodate EV charging, and supporting the Toronto Green Standard to accelerate technology in new buildings. The Strategy identifies a goal of up to 650 public Level 3 charging stations and 10,000 public Level 2 charging stations by 2030. In 2020, Toronto Hydro collaborated with the City to begin a pilot of on-street EV charging stations in residential neighbourhoods.

Council requested action and information on the Electric Vehicle Strategy, including a status report from EED in 2021. Given the opportunities that vehicle electrification offers the City in meeting its climate goals, this report requests a detailed action plan from Toronto Hydro including collaboration with the City to accelerate this work, particularly the roll-out of on-street public vehicle charging stations.

2) Modernizing Outdoor Lighting

The City and Toronto Hydro have piloted the conversion of street lighting from traditional metal halide and high-pressure sodium bulbs to long-lasting and low-energy LED lights. In addition to saving money and reducing power consumption, LED lights improve visibility and contribute to Toronto's Vision Zero pedestrian safety goals.

In 2015 Council requested an updated implementation plan on streetlight conversion (<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW2.12>). That report is outstanding. This report recommends the development of an updated action plan by Toronto Hydro in collaboration with the City, with timelines and costs for the phased conversion of all Toronto streetlights to LED or similar energy-efficient technology.

3) Supporting Renewable Power Projects and Energy Storage Projects

As part of TransformTO, City Council approved a target that 75% of city-wide energy use be from renewable sources by 2050. The City also has a goal of 100MW of energy storage by 2025 and 1000MW by 2050. The cost effectiveness of renewables compared Recommendations to Toronto Hydro on Climate Action

with conventional generation and energy storage has improving dramatically in recent years. A range of studies¹ indicate that the cost of wind and solar energy have fallen approximately 80% since 2010. More recently, energy storage has become cost-competitive, with costs falling 76% since 2012, making wind and solar capacity viable throughout the year. All are projected to see further cost reductions of 15-25% by 2025.

In partnership with the Province, Toronto Hydro is building an innovative battery storage system to provide back-up power to the Eglinton Crosstown light rail transit line to increase reliability, lower operating costs and avoid GHG emissions. The project at Mount Dennis Station will store energy generated by solar photovoltaic generation on-site and drawn overnight from the grid during off-peak hours to supply energy during the day and provide emergency power to the Crosstown in the event of a power interruption.

Despite this cost competitiveness of renewables, gas-fired electricity generation in Ontario is increasing both on the provincial grid and locally through "behind-the-meter" customer-owned generators such as natural gas fired co-generation and combined heat and power systems. From 2005 to 2017, the provincial grid's contribution to Ontario's GHG emissions decreased from 35.4 megatonnes to 2.5 megatonnes (from 17% to 2% of Ontario's total GHG emissions). However, in 2018, the provincial grid's GHG emissions increased to 4 megatonnes and are expected to continue to rise with the refurbishment of nuclear generators and increased reliance on natural gas generation. The City should continue to consider strategies to achieve its renewable energy targets and avoid forecasted carbon emission increases associated with natural gas generation, while accommodating planned growth and creating capacity for electrification and storage.

Achieving the City's renewable energy and storage goals may include coordinated project approvals, engaging with the Province on the proposed Community Net Metering policy framework and investing in renewable energy and energy storage projects.

4) Attracting New Revenues

Utilities and unregulated affiliates (i.e. Toronto Hydro Energy Services Inc.) may be eligible for many of the funding programs offered by the federal government for climate action, and the available funding is expected to grow. For example, Natural Resources Canada's Zero Emissions Vehicle Infrastructure Program provides grants covering half the cost of EV charging. This may offer a mechanism for Toronto Hydro to deliver climate solutions at no net cost to the corporation and while delivering benefits to Toronto.

Unregulated affiliates could also consider undertaking business activities including design, construction, financing, ownership and/or operations of renewable energy, energy efficiency, energy storage, and district energy. Several Ontario LDC unregulated affiliates are making climate solutions a focus, including Oshawa Power's EnerForge, and Alectra's Energy Solutions. EnerForge has various activities underway in the City of Toronto.

¹ <https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf>
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Canada's Clean Fuel Standard (CFS) regulation will create a regulated market for compliance credits to reduce the carbon intensity of transportation fuels in Canada. Provision of EV charging is one of three eligible compliance categories, and charging network operators will be able to sell credits to obligated parties (fossil fuel suppliers). Expected credit values are in the range of \$150-300 per tonne. The CFS regulation draft has been published in the Canada Gazette, and the final regulation is expected to be adopted later this year. This may represent a revenue stream for electric vehicle charging infrastructure, including for on-street charging. <https://gazette.gc.ca/rp-pr/p1/2020/2020-12-19/html/reg2-eng.html>

The Provincial policy framework currently allows investment and cost recovery in distributed energy resources (DERs) – also known as non-wires alternatives – to the extent they can be used to avoid, defer, or minimize costs of infrastructure upgrades. Toronto Hydro is already investing in these assets as part of managing its grid and to prevent new GHG emissions by prospective local natural gas generators. Partnerships between Toronto Hydro and the City could maximize this opportunity by, for example, undertaking robust cost-benefit analysis which considers the multiple benefits of DERs fueled by non-carbon sources.

Lastly, the IESO has initiated a Market Renewal Program to allow a variety of energy resources to compete with conventional supply options, and is piloting a process that will include energy efficiency, demand response, storage and renewables in incremental capacity auctions. This report requests that in its report back to the City, Toronto Hydro address the merits of these and other revenue streams, including participation in IESO-administered markets.

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SIGNATURE

Chris Murray
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ATTACHMENT

Toronto Hydro communication (March 4, 2021) - Additional Input to the City Manager's Office re: Report on EX17.1(19)

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