2020 Toronto Hydro Environmental Performance Report

Contents

Toronto Hydro Corporation

The City of Toronto (the City) is the sole shareholder of Toronto Hydro Corporation (THC). THC is a holding company which wholly owns two subsidiaries: Toronto Hydro-Electric System Limited (THESL), which distributes electricity, and Toronto Hydro Energy Services Inc., which provides street lighting and expressway lighting services in the city of Toronto (collectively, "Toronto Hydro" or the "Company").

The City requires the Company to uphold certain objectives and principles set out in the City's Amended and Restated Shareholder Direction relating to Toronto Hydro Corporation. This report describes how the Company conducts its affairs in accordance with environmentally related objectives set out in the Shareholder Direction by operating in an environmentally responsible manner while supporting the City's energy, climate change and urban forestry policies, and using emerging green technologies as appropriate.

Toronto Hydro has maintained a strong record of environmental performance over many years. Toronto Hydro operates an integrated Environment, Health and Safety (EHS) Management System, facilitating efficiencies to be realized by eliminating duplicate and redundant processes. In September 2020, Toronto Hydro passed an external audit confirming it effectively maintained its EHS Management System in accordance with the International Organization for Standardization's (ISO) 2015 Standard for Environmental Management Systems (ISO 14001:2015) and the ISO's 2018 Standard for Occupational Health and Safety Management Systems (ISO 45001:2018). This marks the eighth consecutive year that Toronto Hydro has been certified to stringent, internationally recognized standards for environmental and occupational safety management systems by independent third-party auditors.

In addition to the ISO 14001:2015 certification, Toronto Hydro is one of eight electrical utilities in Canada to have earned the prestigious Sustainable Electricity Company™ designation, awarded by the Canadian Electricity Association (CEA) following a comprehensive evaluation by the CEA. Also, two of Toronto Hydro's four work centres are currently certified as meeting the Building Owners and Managers Association of Canada's (BOMA Canada) requirements for building environmental standards (BOMA BEST). Toronto Hydro is pursuing recertification of a third work centre to the BOMA BEST requirements.

Overall, Toronto Hydro continues to strive to remain a sustainable electricity company. The Company regularly monitors and assesses all aspects of its environmental performance in an effort to reduce its environmental footprint and improve efficiency. Toronto Hydro also enables customers to be part of the shift to a sustainable economy by connecting renewable power and energy storage to the grid; encouraging the use of electrified transportation; and offering online billing to reduce paper consumption.

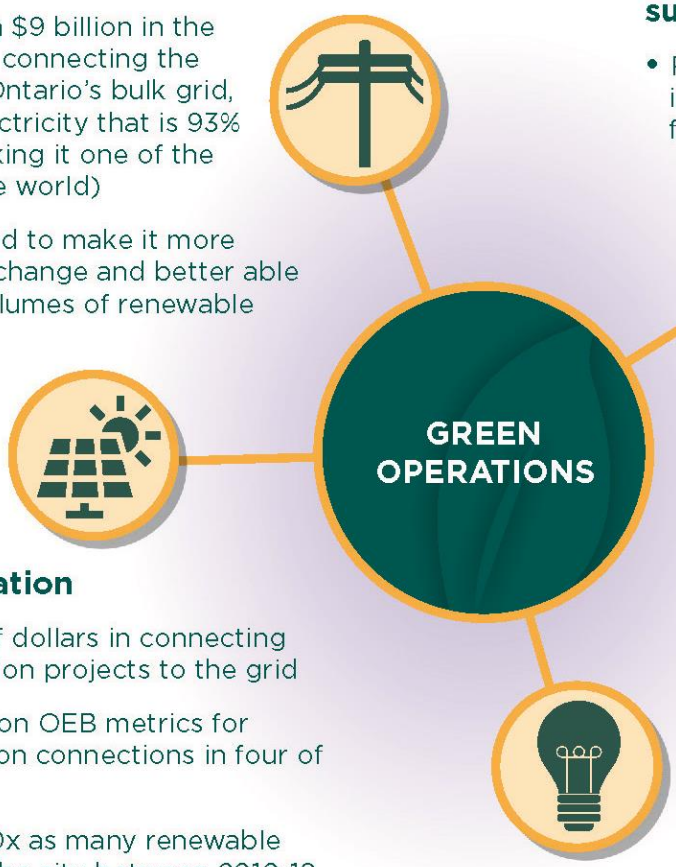
Toronto Hydro has received recognition for its leadership in Environment, Social and Governance (ESG) and sustainability and climate change adaptation from multiple sources for several years, including being recognized second in 2020 on the Corporate Knights' Best 50 Corporate Citizens in Canada list and first overall amongst electric utilities globally.

Environmental performance is a core value at Toronto Hydro. We actively contribute to the City's climate change goals, have a demonstrably strong record on environmental performance, and have been recognized as a top environmental performer, partner and leader.

A STRONG TRACK RECORD OF ENVIRONMENTAL PERFORMANCE

Investing in delivering clean energy

- Investing more than $9 billion in the distribution system connecting the City of Toronto to Ontario's bulk grid, which produces electricity that is 93% emissions free (making it one of the cleanest grids in the world)
- Modernizing our grid to make it more resilient to climate change and better able to handle higher volumes of renewable energy projects



Integrating environmental sustainability into our operations

- Reduced our GHG emissions by 44% (2019), including through an overall reduction in fleet vehicles
- Committed to the exclusive procurement of EV passenger vehicles (2021)
- Improved recycling rate to 90% and reduced annual paper consumption by 38%
- Completed a facilities consolidation project that reduced our footprint by 43% and reduced facilities emissions by more than half over five years

2015	430 sq.ft.
2019	240 sq.ft.

Space utilization per employee

Connecting renewable generation

- Investing millions of dollars in connecting distributed generation projects to the grid
- 100% performance on OEB metrics for renewable generation connections in four of the last five years
- Facilitated nearly 10x as many renewable energy projects in the city between 2010-19

2010	216
2019	2,070

Renewable energy projects in the city

Driving energy efficiency

- Largest investment in conservation in the province, helping customers manage and reduce energy consumption
- Achieved energy savings equivalent to taking 600 large condo towers off the grid (2006-2015)
- Investing in innovative solutions like battery storage to help manage peak demand and lower costs

Planning for the future

- Received OEB approvalon a five-year business plan for 2020-2024 that meets customer needs and preferences
- Includes action on energy efficiency, demand management and renewable energy integration

Advocating for pro-environmental policy

- Driving environmentally-sound energy policies through industry leadership
- Senior leaders serve as board members for organizations that advance sound energy policies and initiatives

Partnering with the City

- Partnered on over 70 solar generation projects and EV charging pilot projects across the city
- Supporting solar/ battery projects for the City's EMS-46 station (increasing resiliency) and the Waterfront Neighbourhood Centre (eliminating fossil fuel back-up generators)

Environmental Achievements

- Designated as a Sustainability Electricity Company™ by the Canadian Electricity Association (CEA)
- Ranked first among electric utilities and second among all Canadian companies for sustainability by Corporate Knights
- CEO awarded Responsible CEO of the Year by Corporate Responsibility Magazine and the Individual Leadership Sustainability Award by the CEA
- Achieved various operational certifications, including ISO 26000:2010 (Guidance on Social Responsibility) and BOMA BEST® green building certification for our work centres

Energy Use and Greenhouse Gases

Through its TransformTO strategy, the City of Toronto established targets to reduce greenhouse gas (GHG) emissions within the city over the coming decades.[1] Toronto Hydro is supporting these goals by reducing its own GHG emissions associated with its fleet, facilities, line losses and releases of sulphur hexafluoride (SF_6) gases, and partnering with the City on efforts to achieve its emissions reduction targets as well.

GHG emission reductions associated with Toronto Hydro's solar photovoltaic (PV) project investments are covered in the Development Projects section of this report.

GHG Inventory

Toronto Hydro's GHG inventory includes Scope 1 and 2 emissions (explained in more detail below), quantified in accordance with national and provincial GHG reporting guidelines[2] and the GHG Protocol – Corporate Accounting and Reporting Standard[3]. The organizational boundary of this GHG inventory includes all Toronto Hydro-owned and controlled (i.e. leased) facilities.

Scope 1 emissions consist of direct emissions from stationary combustion (natural gas combustion for facilities and propane combustion used for tools and heating the aggregate shed), mobile combustion (fuel combustion for fleet) and fugitive sources (releases of SF_6 and refrigerant gases). Scope 2 emissions include indirect emissions from the use of purchased electricity (facilities and line losses). Scope 3 emissions consist of all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 emissions are not included in the Toronto Hydro GHG inventory.

The emission factors used to calculate the GHG emissions are published by Environment and Climate Change Canada[4] and are representative of Ontario's energy supply mix. GHG emissions are measured in tonnes of carbon dioxide equivalent emissions (tCO_2e).

Organizational Boundaries

Toronto Hydro's organizational boundaries include all Toronto Hydro-owned equipment and vehicles, as well as occupied buildings. There were no significant changes in 2020 to Toronto Hydro's organizational boundaries.

Data Sources and Assurance

Facilities Energy Data – Energy consumption data (electricity and natural gas) is gathered from utility providers for all Toronto Hydro-owned and controlled work centres. Building-specific energy consumption data is populated in a database (the "Sustainability Performance Indicators" database).

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[1] https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/

[2] Environment and Climate Change Canada, *Technical Guidance on Reporting Greenhouse Gas Emissions*, available at http://www.ec.gc.ca; Ontario Ministry of the Environment, Conservation and Parks, *Guideline for Quantification, Reporting and Verification of Greenhouse Gas Emissions*, available at https://www.ontario.ca/page/ministry-environment-conservation-parks.

[3] *The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard* (World Resources Institute and World Business Council for Sustainable Development), available at https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

[4] Emission factors published in Environment Canada's *National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada*.

Facility energy billing data is comprised of digital files for electricity and bills from utility companies for natural gas.

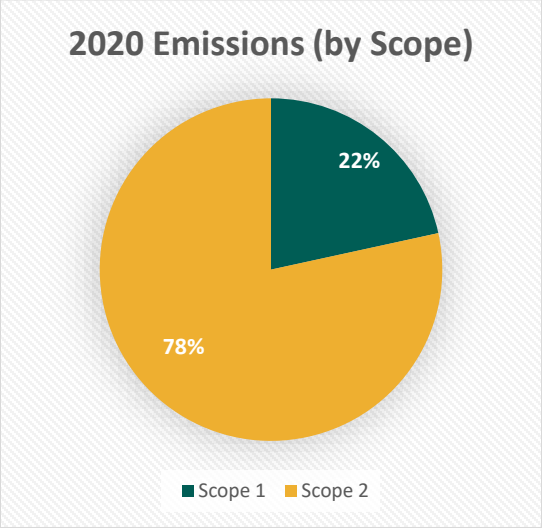
GHG emissions from stationary air conditioning and refrigeration equipment (refrigerant leaks) and emissions from propane combustion were deemed not material (<0.05% of emissions) and are not included.

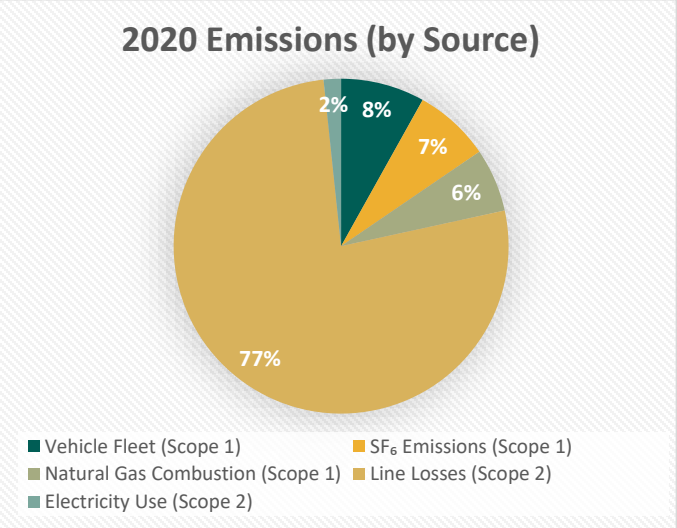
Fleet Fuel Data – A similar process to the facilities energy data collection and assurance is used for the fuel consumption data of the motor vehicle fleet. The Sustainability Performance Indicators database is populated from various datasets acquired from fuel suppliers and through billing statements.

SF_6 Emissions Accounting Process – Toronto Hydro gathers SF_6 emissions data by tracking the amount of SF_6 used to refill equipment and the amount of SF_6 released from decommissioned and repaired equipment. Toronto Hydro's SF_6 emissions are calculated in accordance with the *SF_6 Emission Estimation and Reporting Protocol for Electric Utilities* published by Environment and Climate Change Canada.

Results and Analysis

The following diagram shows the make-up of Toronto Hydro's carbon footprint. In summary, 77% of the emissions is attributed to line losses, 7% is from SF_6 emissions, 8% is from facilities (electricity and natural gas use) and another 8% is attributed to fleet emissions.





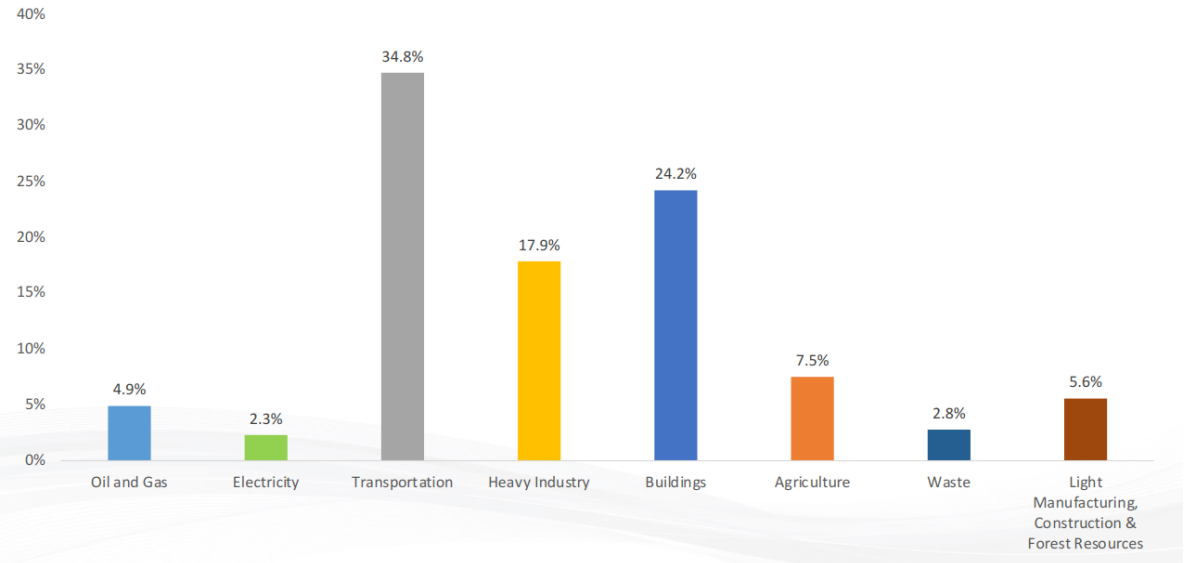
Natural gas combustion at Toronto Hydro's facilities decreased by 19% (187,268 m^3) from 2019 and by 40% (522,192 m^3) from 2016. In addition, Toronto Hydro's **overall electricity use decreased by 3%** (412 MWh) in 2020 compared to 2019 and by 29% (5,719 MWh) compared to 2016.

These improvements were partially due to increased work from home in response to COVID-19 as well as the optimization of the building automation systems at Toronto Hydro work centres. Additionally, two of Toronto Hydro's work centres have achieved BOMA BEST Certification in recognition of the resource efficiency and environmental programs implemented (discussed further in the Environmental Initiatives section), and a third work centre is currently in the recertification process.

The **fleet fuel consumption and associated emissions decreased by approximately 4%** relative to 2019. Fuel consumption decreased by 26% and emissions decreased by 27% relative to 2016. The decrease is attributed to continued efforts to increase the use of lower emission biofuels, to introduce fully electric vehicles, to reduce the number of vehicles and optimize their use (see details in "Fleet Related Initiatives" section below) and the implementation of the Idle Management System (Governor to Reduce Idle and Pollution - GRIP). Additional benefits, including reductions in idling time, fuel use and kilometres travelled, are included in the Environmental Initiatives section.

Multi-year investments to replace obsolete equipment are increasing the efficiency of the distribution system and contributing to reduced line losses. Toronto Hydro is replacing less efficient 4.16 kilovolt (kV) infrastructure with more efficient 13.8 kV and 27.6 kV infrastructure. In addition to reducing line losses, upgrading 4.16 kV infrastructure will allow Toronto Hydro to more efficiently accommodate new large customers, renewable generation connections and electric vehicle charging stations in high-growth areas of downtown Toronto. In 2020, Toronto Hydro's efforts to increase the efficiency of the system contributed to a **19% (149,296 MWh) reduction in line losses** compared to 2019. However, total emissions associated with line losses increased in 2020 compared to 2019 due to a year-over-year increase in the provincial emission factor. Despite the year-over-year increase, the emission factor for electricity in Ontario remains relatively low (87% lower than it was in 2005) and the electricity sector contributed the least emissions of all sectors in Ontario (see chart below). Additionally, 93% of electricity generated in Ontario in 2020 was from sources that did not emit GHGs[5].

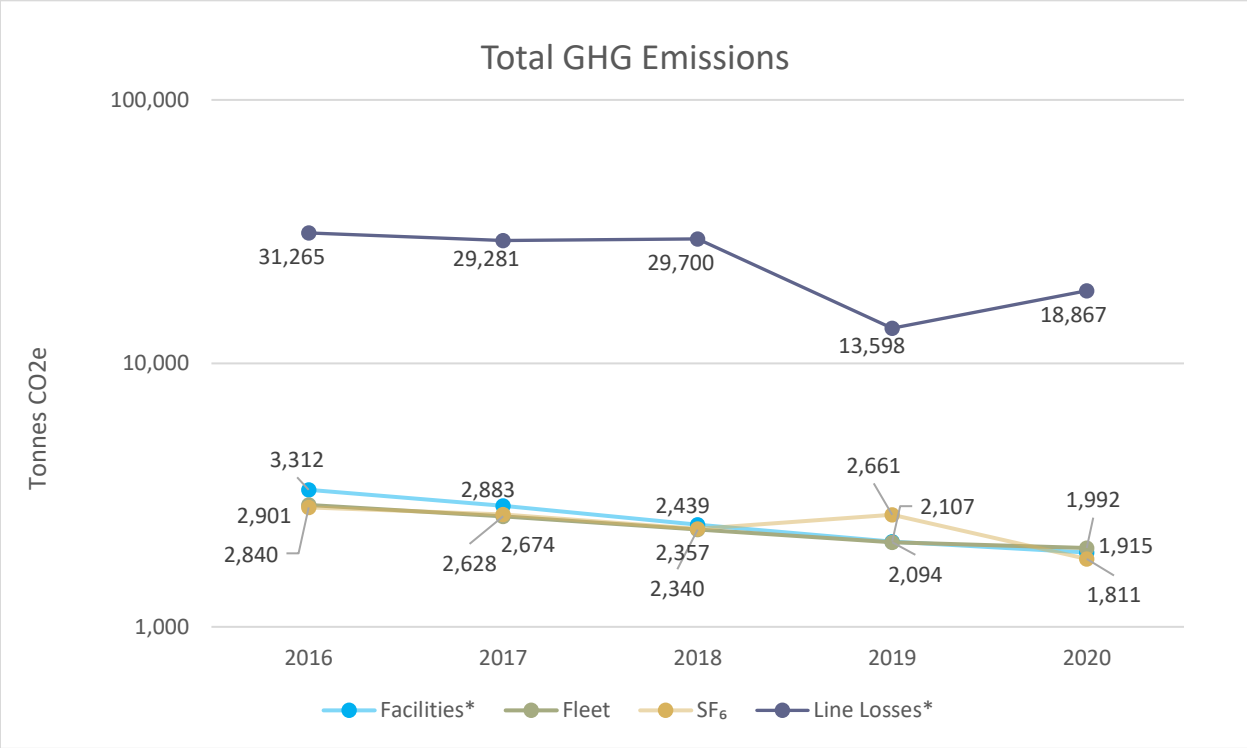
GHG Emissions for Ontario by Canadian Economic Sector, 2018



Source: Environment and Climate Change Canada. National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada. Canada's Submission to the United Nations Framework Convention on Climate Change. Part 3. 2020. Table A12-7.

[5] https://www.oeb.ca/about-us/mission-and-mandate/ontarios-energy-sector

Below is the historical data on Toronto Hydro's GHG emissions by source (i.e. facilities, fleet and line losses). Toronto Hydro's 2020 GHG emissions were 24,584 tCO_2e, an increase of 20% relative to 2019 resulting from the previously discussed year-over-year increase in the annual emission factor for electricity.



*Emissions associated with electricity are impacted by the annual emission factor for electricity in Ontario

Environmental Initiatives

Electric Vehicles

Vehicles are one of the largest sources of GHGs in Toronto. In fact, the City of Toronto stated that approximately one-third of the GHG emissions in Toronto are from vehicles.[6] The City also indicated that the transition to electric vehicles is one of the primary actions from the City's plan to achieve the 2050 goal of reducing emissions to net zero and set a goal for 100% of vehicles in Toronto to use low-carbon energy by 2050. Toronto Hydro supports the transition to electric vehicles by increasing the availability of electric vehicle charging stations for the residents of Toronto, as well as Toronto Hydro employees. Additionally, Toronto Hydro is committing that, where available, all purchased light-duty passenger vehicles will be hybrid or fully electric. This commitment does not include purchases that are already underway for 2021.

[6] Page 2 of https://www.toronto.ca/wp-content/uploads/2020/02/8c46-City-of-Toronto-Electric-Vehicle-Strategy.pdf

In an effort to remove some of the barriers to electric vehicle ownership for employees, Toronto Hydro installed charging stations at three work centres. While users are required to pay for the use of these stations, the availability of charging infrastructure removes a major barrier to the adoption of electric vehicles. Four charging stations are currently operational at the 500 Commissioners and 715 Milner locations, while ten are available for employees at the David M. Williams Centre.

Toronto Hydro also demonstrates leadership in the electrification of transportation through an ongoing project initiated to replace small cars in the Toronto Hydro fleet with fully electric vehicles. Currently, Toronto Hydro's fleet includes nine fully electric, light-duty vehicles. In addition to the environmental benefits, the transition to electric vehicles is expected to provide financial savings from decreased fuel consumption and reduced vehicle maintenance.

Toronto Hydro works with various industry associations and levels of government to enable the adoption of electrified transportation. At the municipal level, Toronto Hydro partners on the development of electrified transportation projects with agencies such as the Toronto Parking Authority and the Transportation Services division of the City of Toronto. Toronto Hydro also supported the City of Toronto's electric vehicle strategy through work with the City's Environment and Energy division. At the federal level, Toronto Hydro provides input to electric vehicle forums facilitated by Natural Resources Canada and actively engages with the CEA on federal electric vehicle advocacy. Toronto Hydro is also represented on the Board of Directors of Plug'n Drive, a non-profit organization committed to accelerating the adoption of electric vehicles. Participation in various electric vehicle projects and associations has allowed Toronto Hydro to establish a leadership position in the electrification of transportation.

Electric Vehicle Charging Station Pilot Project

Toronto Hydro and the City of Toronto have partnered to install electric vehicle charging stations on select streets across the city. Toronto Hydro also worked with a Canadian charging station manufacturer and operator to install the stations. These stations are part of a pilot project, which aims to:

- Understand charging usage in Toronto
- Help permit holders gain access to on-street charging
- Support the reduction of greenhouse gas emissions and other emissions harmful to air quality

A total of 17 charging stations have been installed across nine locations throughout the city. The charging stations are located in areas that have enough capacity for dedicated electric vehicle parking spots. These locations were also chosen because the pole placement allowed for safe installation of the charging stations with minimal disruptions to pedestrians and the community. A variety of information including usage data, feedback from electric vehicle owners who use the stations and feedback from the community will be used to evaluate the pilot project.

Electric Buses

Toronto Hydro is supporting the Toronto Transit Commission's (TTC) move to electric buses. To meet the City of Toronto's TransformTO climate change targets, the TTC plans to eliminate emissions from its entire fleet by 2040.[7] Transportation is currently the largest source of greenhouse gas emissions in

[7] Page 60 of https://www.toronto.ca/wp-content/uploads/2019/06/90de-TransformTO-Implementation-Update.pdf

Ontario. With Ontario's relatively clean electricity generation mix, electric transportation provides an environmentally sound alternative to fossil fuel-based transportation.

Toronto Hydro assisted the TTC with the technical requirements for adopting electric buses and with selection of the first locations for the electric bus program. The first TTC garages to be used for charging (Arrow Garage, Eglinton Garage and Mount Dennis Garage) were selected based on their geographical location as well as available electrical capacity. All charging equipment was installed and in use by the end of 2019, allowing 60 buses to enter service by the end of 2020. This makes up the largest fleet of electric buses in North America.[8]

Toronto Hydro is also assisting the TTC in implementing energy management and energy storage projects at TTC facilities. The 1 MW/4 MWh energy storage systems are expected to be in service in 2021. Once in service, the energy storage will allow the TTC to balance its electrical load throughout the day and increase overall reliability at the garages. Toronto Hydro will accommodate the future growth of electric buses by enhancing the electrical infrastructure required for new bus-charging equipment.

Fleet-Related Initiatives

Toronto Hydro operates a fleet of vehicles, which are a source of environmental impacts. Vehicle operation inevitably leads to waste, such as waste vehicle fluids and waste vehicle components as a result of vehicle maintenance (e.g. batteries, engine parts, etc.) and the emission of GHGs. In order to reduce this waste, Toronto Hydro decreased its fleet size by approximately 3% in 2020. Toronto Hydro also undertook a number of initiatives to help reduce engine operation, thereby decreasing the associated waste, vehicle maintenance and emissions while increasing the life cycle of vehicles. These initiatives provide value to the residents of Toronto by reducing pollution, engine noise and odours, and aim to increase value to the shareholder and ratepayers by extending the life cycle of vehicles and reducing repair and maintenance costs.

Anti-Idling Technologies

In 2020, Toronto Hydro continued its use of the Governor to Reduce Idle and Pollution (GRIP) technology on Toronto Hydro vehicles. The GRIP system functions by shutting the engine off after one minute of idling, in accordance with the City of Toronto bylaw, and switching to the auxiliary battery power source requiring long-lasting batteries in order to fully optimize the GRIP system's use.

In total, 14% of Toronto Hydro's on-road vehicle fleet (29 cube vans, 24 bucket trucks and five pickup trucks) have been equipped with GRIP since use of the technology began in 2014. This led to an approximately 31% decrease in idling time for cube vans compared to other cube vans without GRIP technology. The GRIP module was added into the specification of nine new pickup trucks procured in 2020, which will go into service in 2021. This will allow further evaluation of GRIP technology on pickup trucks. In addition to the vehicles equipped with GRIP, 10% of the vehicle fleet was hybrid or electric at the end of 2020. Five more fully electric vehicles have been procured in 2020, which will go into service in 2021.

[8] https://www.ttc.ca/News/2020/September/08_09_20NR_ebus_fleet_announcement.jsp

Toronto Hydro identified that increasing battery life through the introduction of lithium ion batteries can lead to further idling reductions. Lithium ion batteries last longer than the current lead acid batteries. This reduces the emissions associated with idling by optimizing the performance of the GRIP system to allow vehicles to operate off the battery for a longer period of time. The lithium ion batteries also have a longer lifespan compared to lead acid batteries, which reduces the amount of wasted batteries. Toronto Hydro undertook a two-phase pilot project in 2017 and 2018 to test the effectiveness of lithium ion batteries in vehicles in conjunction with the existing GRIP system. This was done to complete a cost benefit analysis to determine if the savings from idling reduction offset the increased cost of lithium ion batteries. At this time, due to the higher cost of the lithium ion batteries, this technology will not be adopted as a wide standard across the fleet of cube vans. Monitoring and re-evaluation of the cost benefit analysis will be ongoing as the costs of lithium ion batteries continues to decline. Toronto Hydro continues to pursue alternate emerging technology to help reduce the idling time and emissions generated from fleet vehicles.

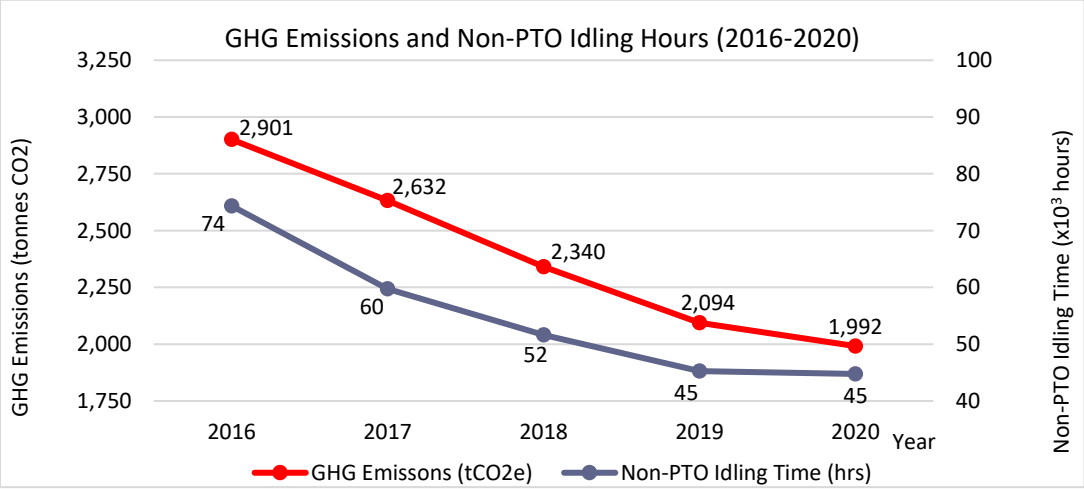
Bio-Diesel

Toronto Hydro uses combined bio-diesel and standard diesel to reduce the emissions from its fleet. Bio-diesel generates approximately 8% less GHG emissions upon combustion than standard diesel. In total, the use of bio-diesel eliminated approximately 33 tCO_2e in 2020.

Cumulative Benefits

For most of 2020, Toronto Hydro leveraged its shared vehicle fleet to limit the occupancy of each vehicle to one employee to mitigate the transmission of COVID-19. The shared vehicles were used more frequently to comply with this limit. Despite the increased usage, Toronto Hydro's fleet related initiatives helped achieve a 5% reduction in fuel use (38,000 litres) and a GHG reduction of 102 tCO_2e in 2020 relative to 2019.

The savings associated with the aforementioned fleet related initiatives, compared to 2016 are: 30% reduction in total fuel consumed (approximately 341,000 L); 31% reduction in GHG emissions (909 tCO_2e); 27% reduction in kilometres travelled (approximately 920,000 km); and 40% reduction in total non-PTO[9] idling hours (approximately 29,600 hours). The graph below illustrates the correlation between the decrease in idling time and GHG emissions from vehicles.



[9] Some of Toronto Hydro's vehicles (e.g. bucket trucks) require engines to be kept on (idling) in order to charge and operate the vehicle hydraulics. This is referred to as PTO idling time.

Smart Commute

Metrolinx and the City of Toronto work together with businesses to promote the Smart Commute program to make commuting easier, healthier and more enjoyable. The program also strives to reduce traffic congestion, improve air quality and encourage community members to take action on climate change.

Recognizing the importance of sustainable workplace commuting Toronto Hydro has collaborated with Smart Commute to provide programs and services to support efficient and sustainable commuter options to employees at the 14 Carlton and 500 Commissioners work centres since 2015. Toronto Hydro has since expanded the program to include the David M. Williams Centre (71 Rexdale) and the 715 Milner work centre. All four Toronto Hydro work centres are now included in the program.

In 2020, Toronto Hydro completed internal communication campaigns to support Smart Commute Week in February and Bike Month in September. In previous Smart Commute surveys, employees indicated that the alternative transportation method they would be most willing to try was carpooling. However, Toronto Hydro emphasized alternate methods of transportation that mitigated the transmission of COVID-19 (e.g. biking).

Tree Planting

In the past, Toronto Hydro has hosted an annual Tree Planting Event with the non-profit organization Local Enhancement & Appreciation of Forests (LEAF) and the Parks, Forestry and Recreation division of the City of Toronto. The purpose of this event is to engage employees in the improvement of the natural environment in communities in which Toronto Hydro serves customers. Toronto Hydro did not host a tree planting event in 2020 as a preventative measure to reduce the risk of COVID-19 transmission. It is anticipated that annual tree planting events will resume when it is safe to do so. Since 2004, more than 5,010 trees have been planted across the city through these partnerships.

Reducing Hazardous and Non-Hazardous Waste

Similar to most electrical utilities in Canada, Toronto Hydro owns and operates equipment that has oil containing polychlorinated biphenyls (PCBs). The operation of this equipment is compliant with the current PCB Regulations under the *Canadian Environmental Protection Act, 1999*. In preparation for legislation coming into effect in 2025, Toronto Hydro is proactively removing and arranging for the safe destruction of equipment and oil at risk of containing PCBs at a concentration greater than 50 parts per million (ppm) to ensure compliance with the new legislation.

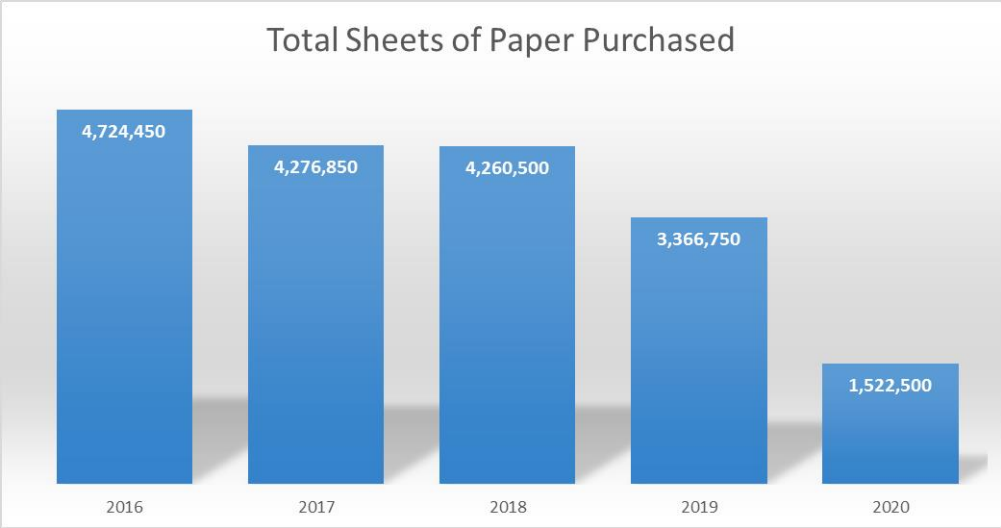
An organized approach to the removal and destruction of equipment and oil at risk of containing PCBs is enabled by proactive inspections of equipment suspected of having oil containing PCBs and testing of oil in equipment for the presence of PCBs. Approximately 5,700 kilograms of solid material and 2,300 litres of liquids containing PCBs were shipped for destruction in 2020. The total PCB material shipped for safe destruction decreased by approximately 2,450 kilograms compared to 2019.

A recycling rate is the percentage of total waste generated that is sent for recycling. Toronto Hydro measures the recycling rate of the waste included in *O. Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs* as well as some electric utility specific waste such as concrete and wood utility poles. Thanks to committed employees, effective source separation has led to an

improvement in this recycling rate from 89% in 2019 to 90% in 2020. Recycling bins have been installed throughout buildings and in the yards at work centres to allow materials such as coffee cups, plastic bottles, metal cans, plastic shopping bags, paper towels and recyclable plastic material from the field to be diverted from landfill. Organics recycling containers have also been installed throughout work centres to divert organic materials from the landfill.

Reduction of Paper Consumption

The key to reducing waste is eliminating consumption of the materials that generate waste. Toronto Hydro has implemented numerous initiatives to reduce the amount of paper used. Annual consumption was reduced by approximately 55% or 1,844,250 sheets in 2020 compared to 2019. This equates to savings of approximately 75 tCO_2e[10] in associated GHG emissions and approximately $13,900 in 2020 compared to 2019. These savings do not include other costs such as storage and transportation of paper records. The reduction of paper use in 2020 is partially attributed to an increased number of employees working from home as a preventative measure to reduce the risk of COVID-19 transmission.



BOMA BEST Certification

In 2018, Toronto Hydro achieved BOMA BEST Gold Certification at the David M. Williams Centre and the 715 Milner work centres from the Building Owners and Managers Association of Canada (BOMA Canada). The construction of these two work centres required the remediation of former industrial sites. In 2017, the Toronto Hydro facility at 500 Commissioners achieved BOMA BEST silver certification. This expired on December 31, 2020, and Toronto Hydro plans to reapply for the certification in 2021. BOMA BEST certification is a nationally recognized voluntary framework for assessing the environmental performance and management of existing buildings of all sizes. The independent third-party certification assesses the policies, programs and procedures in place at a building through a document review and on-site verification.

Energy Conservation and Demand Management (CDM)

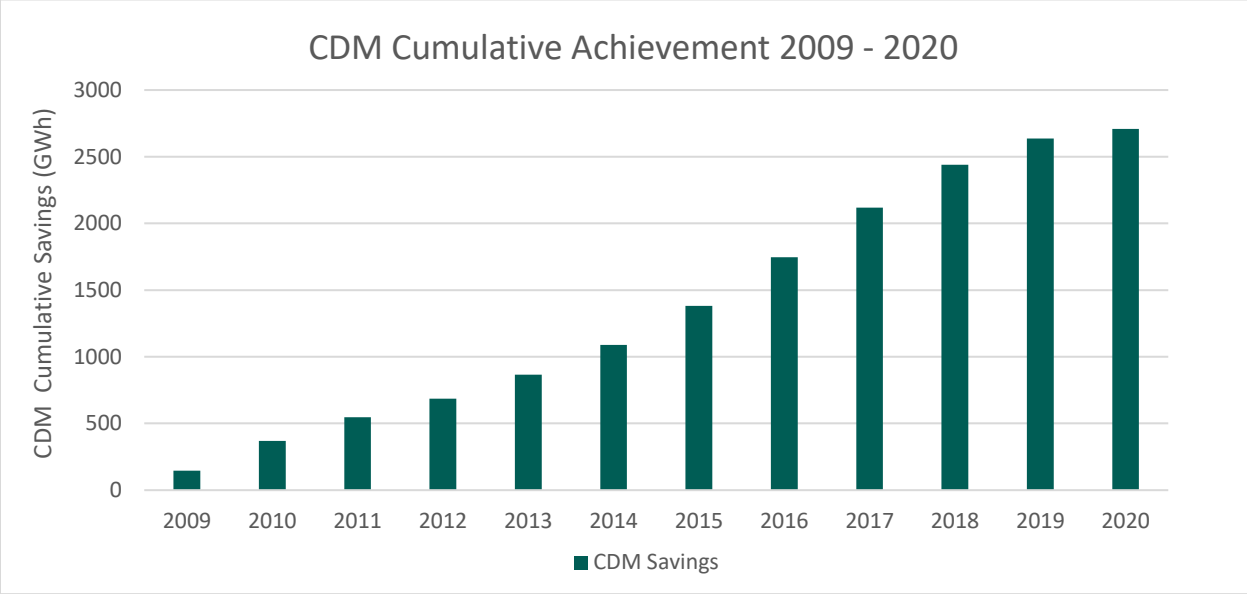
The Government of Ontario made changes in 2019 to the conservation programs in Ontario, and directed the Independent Electricity System Operator (IESO) to deliver CDM programs centrally.

[10] Environmental impact estimates were made using the Environmental Paper Network Paper Calculator Version 4.0. For more information visit papercalculator.org.

Agreements for the CDM programs in place prior to these changes remained in effect and Toronto Hydro remains responsible for its obligations under the agreements. Participants have until June 30, 2021 to complete the projects. Ontario businesses will continue to have access to incentives for retrofits and other energy-efficiency projects to help lower their energy costs.

In 2020, Toronto Hydro worked with residential, small business, industrial and commercial customers to implement energy-efficiency projects that had been initiated prior to the changes described above. Toronto Hydro's 2020 CDM programs led to an estimated energy savings of more than 72,000 MWh and reduced peak demand by 9 MW. These initiatives also helped to reduce GHG emissions in the city by 2,088 tCO_2e[11] since 2019.

Through Toronto Hydro's CDM initiatives, customers have reduced electricity consumption by a cumulative 2,709 GWh[12] and GHG emissions by a cumulative 136,441 tCO_2e[13] since 2009. During the same period, Toronto Hydro's CDM programs helped customers reduce their peak demand by a cumulative 416 MW.[14]



Renewable Energy

Toronto Hydro supports renewable generation across Toronto through the enabling of infrastructure and direct project investments. The initiatives described in the following section demonstrate how partnership with Toronto Hydro is helping to achieve the City's TransformTO goals of 75% of community-wide energy use being derived from renewable or low-carbon sources by 2050[15], as well as installing 24 MW of renewable energy capacity on City-owned facilities and lands by 2020[16].

[11] Estimated using 2018 Ontario emission factors published in Environment Canada's *National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada*.
[12] The energy and peak demand savings represent cumulative totals but do not account for savings persistence.
[13] Estimate using the Ontario emission factors published for each year between 2009-2018 in Environment Canada's *National Inventory Report*.
[14] The peak demand savings do not include achievement from demand response programs
[15] Page 3 of https://www.toronto.ca/wp-content/uploads/2020/11/96aa-TTO-2019-Update-June2020-FINAL-AODA.pdf
[16] Page 13 of https://www.toronto.ca/wp-content/uploads/2020/11/96aa-TTO-2019-Update-June2020-FINAL-AODA.pdf

Enabling Infrastructure

Toronto Hydro's connection process for renewable generation resources is governed by the Ontario Energy Board's (OEB) Distribution System Code.

Toronto Hydro provides support including pre-assessments, connection impact assessments, and commissioning and engineering support for renewable distributed energy resources with its grid. Additionally, Toronto Hydro offers net metering for solar installations where the amount of energy produced by the solar panels is metered and used to offset the owner's electricity bill.

Toronto Hydro enabled 20 renewable distributed energy resources totalling approximately 4.3 MW capacity in 2020. Assuming a specific yield of 1,100 kWh/kWp[17], these projects would produce 4.7 GWh and displace approximately 137 tCO_2e[18] annually.

Development Projects

In addition to connecting customers' renewable energy projects, Toronto Hydro directly invests in renewable generation and energy storage projects.

Investment

Toronto Hydro jointly invested with the City in solar PV projects on City-owned facilities. These projects were separated into three groups (Groups A, B and C). Group A consists of 10 installations and has an installed capacity of 1 MW. The construction of these projects was completed between 2012 and 2013. In 2020, these projects generated 1,400 MWh and displaced approximately 40.6 tCO_2e. Group B consists of 10 installations with a combined capacity of 1.5 MW constructed between 2015 and 2016. These installations generated 1,870 MWh and displaced approximately 54.2 tCO_2e in 2020. Toronto Hydro has majority ownership of the Group A projects, while the City of Toronto has majority ownership of the Group B projects (both are split 51%/49%).

Group C consists of 52 installations with a combined installed capacity of 5.8 MW completed in 2018. The City of Toronto owns the majority of the Group C installations, with the exception of two installations at Toronto Hydro-owned facilities: the David M. Williams Centre and 715 Milner. Toronto Hydro owns 51% of these two installations, each with 500 kW capacity. The installation at the David M. Williams Centre generated 397 MWh in 2020 and displaced approximately 11.5 tCO_2e, while the installation at 715 Milner generated 721 MWh in 2020 and displaced approximately 20.1 tCO_2e.

Toronto Hydro previously invested in two other renewable generation projects (Better Living Centre Solar and 500 Commissioners Solar), which together have an installed capacity of 500 kW, generated 763 MWh and displaced approximately 22.1 tCO_2e in 2020.

Combined Solar and Energy Storage – Toronto Hydro worked with the City of Toronto in 2019 to pilot a combined solar and energy storage project at a Toronto Paramedic Services station. This was the first time that either Toronto Hydro or the City piloted a project of this nature. The project involved the installation of roof and wall-mounted solar panels on the station, which are connected to a battery that stores the electricity generated by the panels. The solar panels have a generation capacity of over 8 kW and the batteries are capable of storing up to 27 kWh. A sufficient amount of electricity can be stored in the batteries to operate critical loads in the station during a power outage, thereby increasing the resiliency of the station. The excess electricity generated can be connected to Toronto Hydro's

[17] kWp represents kilowatt peak, the maximum output of the system

[18] Estimated using 2018 Ontario emission factors published in Environment Canada's *National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada*.

distribution grid and used to offset the cost of electricity at the station. The project helps improve the station's ability to respond to emergencies and provides a financial benefit to the City. The system generated 10.4 MWh in 2020 and displaced approximately 0.3 tCO_2e. More than 50% of the station's annual energy consumption was from solar generation.

A second combined solar and energy storage project was initiated in 2019, building on the success of the project at the Paramedic Services station. The second project involved the installation of solar panels with a capacity of 120 kW and energy storage of up to 220 kWh at the Waterfront Neighbourhood Centre at 627 Queen's Quay West. The system will eliminate the need for fossil fuel-powered generators as backup power at the community centre, along with the associated greenhouse gas emissions. The construction was completed in 2020 and will be operational in 2021. This project will be representative of a typical community centre in Toronto and will serve as a proof of concept for combined solar and energy storage at these types of buildings.

Bulwer Battery Energy Storage System (BESS) Project - The Bulwer BESS project is a 2 MW/2 MWh BESS that will be located at Bulwer Municipal Station (MS), a retired 4.16 kV Toronto Hydro electrical substation located in downtown Toronto. This location was chosen as downtown Toronto is a highly populated area with ever-increasing demands for electricity that lead to eventual strain on Toronto Hydro's infrastructure. The BESS allows electricity to be provided to customers when there is an outage, and is thereby expected to increase reliability of service to customers. The BESS also reduces peak loads on distribution equipment, which enables the utility to defer more costly infrastructure investments that would otherwise be required to maintain electricity services for customers. The project was completed with *Renewable Energy Systems Canada* and commissioned in 2020.

Eglinton Crosstown Light Rail Transit (LRT) BESS Project – This project will provide Metrolinx with clean and reliable emergency backup power to operate the new Eglinton Crosstown LRT spanning 20 kilometres between Mount Dennis Station and Kennedy Station. The project includes engineering, construction and commissioning of a 10 MW (30 MWh) BESS and 90 kW solar PV distributed energy resource. The project eliminates the need for fossil fuel-powered generators as backup power for the Eglinton Crosstown LRT, along with the associated greenhouse gas emissions. This solution was determined through outreach to residents of Toronto who would be impacted by the backup power system. Construction was completed in 2020 and the BESS is expected to be commissioned in 2021.

Energy Security and Supply

Toronto Hydro is working to help ensure adequate distribution capacity is available in Toronto. This work also supports the City's objective of ensuring infrastructure resiliency. Toronto Hydro collaborates with Hydro One to mitigate the potential impact of high-risk events that could result from the unplanned loss of critical transmission supply points for central Toronto, supporting key financial and hospital customers.

Investing in the Grid - Capital Expenditure Plan

Renewing the grid and replacing aging, deteriorating, obsolete and failing distribution equipment while meeting the needs of a growing city is a costly and complex endeavour. To address these challenges,

Toronto Hydro develops and implements capital expenditure plans, which outline investment needs and explain how planned investments will achieve outcomes that deliver value for customers.

On December 19, 2019, the OEB issued its decision and on February 20, 2020, the OEB issued its rate order, both in relation to Toronto Hydro's 2020-2024 rate application filed on August 15, 2018. In its rate application, Toronto Hydro requested approvals to fund capital expenditures over the 2020-2024 period. The 2020-2024 capital plan continues Toronto Hydro's effort to harden the distribution system to make it more resilient when extreme weather hits.

The capital expenditure plan consists of four main investment categories: system access, system renewal, system service and general plant.

1. Investments in the System Access category are driven by statutory and regulatory obligations to provide customers with access to Toronto Hydro's distribution system. This includes investments to connect renewable energy generation facilities, and metering-related investments to maintain compliance with regulations.
2. Investments in the System Renewal category target the renewal and refurbishment of distribution assets that have failed or are operating with an unacceptable level of performance risk. These programs focus on remediating assets that pose significant safety, reliability and environmental risks to customers, employees and the general public.
3. Investments in the System Service category target system-wide critical issues such as capacity and operational constraints, security-of-supply, safety, system reliability and other considerations for the effective operation of the distribution grid.
4. Investments in the General Plant category are essential to Toronto Hydro's 24/7 day-to-day operational activities. These investments include the renewal and upgrade of critical software and hardware systems, vehicles and associated equipment, and facilities.

Preventive Asset Maintenance and Vegetation Management

Toronto Hydro conducts proactive inspection and maintenance work to help mitigate a wide variety of risks. For example, the Company inspects underground transformers on a regular interval to gather information about their condition and to help reduce the number of equipment failures that may adversely impact the environment. Information gathered through inspections has been used to develop a plan for the removal and replacement of transformers through 2024. In addition, inspections in 2020 allowed Toronto Hydro to identify and proactively replace transformers that were in poor condition.

The specific maintenance and inspection tasks that Toronto Hydro conducts on its equipment and assets, and their frequencies, have been established using an engineering analysis framework called Reliability Centred Maintenance (RCM). At the heart of this framework is an emphasis on safe operations (both from the perspective of work crews and the public), environmental protection, compliance and equipment reliability. Toronto Hydro adopted this framework in the mid-2000s and periodically reviews and updates its RCM analyses.

To mitigate tree-related interference with Toronto Hydro wires, the Vegetation Management program employs modern arboriculture techniques, which are designed to ensure proper care of trees. For example, when trees adjacent to a distribution line are pruned, adjacent distribution lines are expected

to experience a reduction in the number of tree-caused power outages. Tree pruning is conducted in accordance with the City of Toronto's Urban Forestry Tree Pruning Guidelines. In 2020, Toronto Hydro pruned approximately 41,000 trees that are adjacent to distribution lines in a manner that minimizes injury to the trees but helps improves system reliability. These vegetation management practices help protect the system against inclement weather by removing vulnerable sections of the tree canopy that may break during high winds or from the accumulation of ice and snow.

Climate Change and Adaptation

One of the core principles in Toronto Hydro's Environmental Policy is to mitigate the potential adverse effects of climate change on the organization. This is also a requirement of Toronto Hydro's ISO 14001:2015 certification. In 2020, Toronto Hydro continued to improve the system's resiliency to extreme weather events caused by climate change. Toronto Hydro also continued to collaborate on climate change adaptation with the City of Toronto and other agencies. The purpose of the improvements and collaboration is to reduce the impacts of climate change on the residents of Toronto.

Integration in System Planning

In 2015, Toronto Hydro completed a vulnerability assessment study following the Public Infrastructure Engineering Vulnerability Committee (PIEVC) protocol developed by Engineers Canada. The study conducted a risk assessment for the various components and areas of the distribution system that would be affected by climate change, and the results were used to develop a road map on climate adaptation initiatives.

The majority of the road map was completed by the end of 2017 and, since then, Toronto Hydro has continued to integrate considerations regarding the impact of climate change and the risks it presents into its operations. As an example, Toronto Hydro implemented procedures requiring consideration of climate risk when planning new projects.

The consideration of temperature and climate projections is an example of climate risk inclusion in the planning process. Toronto Hydro continually reviews sources of climate data to verify that projections used for planning purposes continue to be valid and widely accepted, particularly as government policy and economic factors continue to influence the direction of future climate action. This review is a requirement of the system planning guidelines for the project planning process, which are planned to be formally implemented in 2021. Prior to development of the system planning guidelines, the review was conducted on an ad hoc basis. For example, with this data, Toronto Hydro can mitigate climate risks to the grid by reviewing and updating equipment specifications, such as the use of tree-proof wire to reduce tree contact risks and associated outages.

Another climate change consideration included in the planning process is proximity of the project to urban flooding areas. Experts predict that flooding will continue to be an issue in the City of Toronto as extreme weather events become more intense and frequent.[19] To mitigate this risk, Toronto Hydro

[19] Page 50 https://www.toronto.ca/ext/digital_comm/pdfs/resilience-office/toronto-resilience-strategy.pdf

plans to install more resilient equipment and infrastructure if a project is planned in an urban flooding area.

Support of the City of Toronto's Resiliency Goals – Urban Flooding Resilience

In 2019, the City of Toronto released a resilience strategy to allow Toronto to adapt and thrive when presented with any challenge, including climate change. One of the components of the resilience strategy is to become a world leader in urban flooding resilience. Toronto Hydro contributed to the flooding section of the resilience strategy through the Urban Flooding Working Group. The working group includes many other organizations, including the University of Toronto, the City of Toronto and the Toronto Transit Commission. One of the purposes of this working group was to identify how Toronto would be affected by future urban flooding events and develop recommendations to mitigate the impacts.

The Urban Flooding Working Group developed a number of recommendations including the development of city-wide modelling to identify flooding hazards, assess impacts, and map vulnerabilities. This model will allow for a more efficient identification of problematic urban flooding areas. As noted above, Toronto Hydro will include consideration of urban flooding areas in the system planning guidelines. A more accurate model, including aspects such as Toronto's sewer infrastructure, will allow Toronto Hydro to more effectively mitigate the impacts of flooding, thereby helping to reduce potential power outages. These recommendations were approved by the City of Toronto Council as part of the overall resiliency strategy.

Participation in Industry Discussions

Toronto Hydro continues to be a leader in industry discussions about the awareness of climate change impacts in the electricity generation, transmission and distribution sectors. Specifically, Toronto Hydro contributed to the CEA's Climate Change Adaptation Working Group and the Energy Working Group of Canada's Climate Change Adaptation Platform (organized by Natural Resources Canada). The purpose of these working groups is to help increase the resilience of the energy sector to the effects of climate change. Toronto Hydro has continued its leadership on these committees by sharing the lessons learned from the adaptation planning measures described above with the CEA working group.

Additionally, Toronto Hydro collaborated with many organizations within the industry on a project led by the Canadian Standards Association (CSA) to develop climate change adaptation solutions within the framework of the Canadian Electrical Code Parts I, II and III.

Extreme Weather

According to the City of Toronto's First Resilience Strategy, Toronto is getting "hotter, wetter, and wilder"[20] due to climate change. There is a greater number of longer-lasting heatwaves and storms, and more extreme cold, wind, ice and rain. The strategy calls for a need for the City and the critical infrastructure owners operating within it to adapt in the face of these chronic stresses and the acute shocks they bring.[21]

In 2020, Toronto Hydro responded to two extreme weather events (windstorms) and prepared for response to Toronto Island flooding. The timely and effective response to these events has been

[20] Page 54 of https://www.toronto.ca/ext/digital_comm/pdfs/resilience-office/toronto-resilience-strategy.pdf
[21] https://www.toronto.ca/wp-content/uploads/2019/05/97c7-Toronto-Resilience-Strategy-One-Page-Brief.pdf

attributed to the proactive work of dedicated employees, as well as to Toronto Hydro's Disaster Preparedness Management (DPM) Program.

Additionally, as a member of the North Atlantic Mutual Assistance Group, Toronto Hydro supported its mutual aid partners' response to three hurricanes (Zeta, Laura and Isaias) by volunteering equipment and material aid. Typically, Toronto Hydro would volunteer in-person aid to extreme weather-affected partners, but all international travel has been halted during the COVID-19 pandemic.

Disaster Preparedness Management Program

In addition to increasing the physical resiliency of the grid to the impacts of extreme weather events, Toronto Hydro continues to develop its DPM Program to improve disaster/emergency response outcomes. The Program involves continued implementation of a comprehensive and industry-leading disaster readiness program that:

- Enhances Toronto Hydro's ability to plan for and operate during a large-scale emergency and/or disaster
- Ensures for effective communication with customers and external stakeholders in anticipation of, during and following an incident
- Minimizes operational and financial impacts of disaster-related disruptions on Toronto Hydro's customers and operations

Grid Emergency Management (GEM) Team

Toronto Hydro's GEM Team are the custodians of the DPM Program. The team is responsible for:

1. Designing, developing, implementing, sustaining and enhancing the program in the face of a changing risk environment in the City of Toronto, which includes:
    - Employee emergency response readiness
    - Facility/system emergency response readiness
    - Stakeholder relationship management
2. Coordinating program activities and aligning emergency management and business continuity activities both internally and with external stakeholders (e.g. City of Toronto's Office of Emergency Management, Hydro One, the IESO, etc.).
3. Promoting a culture of resilience at Toronto Hydro.

Employee Emergency Response Readiness

Training and emergency exercises are critical for ensuring Toronto Hydro is ready to respond to an emergency. The GEM team has made it a priority to integrate Ontario's *Incident Management System* emergency response methodology into the company's Emergency Response Organization (ERO) framework. The majority of Toronto Hydro's senior management and professional employees have received formal training on their functions within the ERO and on how Toronto Hydro would transition into incident response using the ERO under emergency conditions.

The training program is administered through a Learning Management System (LMS) and Enterprise Resource Planning (ERP) System. All employees at Toronto Hydro are assigned emergency roles, which correspond to pre-assigned e-training curricula in the LMS. LMS-based training is complemented by

exercises for select emergency roles (based on complexity of the role). Training data is captured and updated on a monthly basis through the GEM Emergency Role Readiness Key Performance Indicator to ensure that minimum training thresholds are continually met.

Additionally, the ERO framework has been tested through real-life scenarios, which has allowed Toronto Hydro to improve response and recovery efforts. In 2020, the GEM Team tested Toronto Hydro's response capabilities through real-time response to COVID-19. Leading into this event, GEM provided just-in-time training to key personnel on ERO roles and responsibilities, preparing them for whole-of-organization mobilization to pandemic response. This response has been ongoing since March 2020.

Further, Toronto Hydro tested its ERO protocols during a planned event: The Utility Work Protection Code Transition, which took place from December 2020 to January 2021. Emergency management protocols were used to ensure smooth transition into a highly complex, multi-departmental safety system. This planned event enabled us to mobilize emergency roles, leverage and test tools and systems, and obtain feedback from participants on how to optimize our processes.

In 2020, external exercises were cancelled due to ongoing COVID-19 pandemic response.

Facility/System Emergency Response Readiness

In 2020, GEM and the Distribution Grid Operations team continued to build on improvements to emergency response systems to make Toronto Hydro more response-ready. This included introducing/optimizing several response information management systems that are used to facilitate more effective extreme weather event response. (Implementation is ongoing). These systems are:

- Outage Management Application: a damage assessment application that enables Damage Assessment teams to more easily submit damage notices to dispatch personnel during storm response for resolution
- Weather Prediction Tool: high-precision weather forecasting and predictive damage modeling tool that enables Toronto Hydro to make more accurate response resourcing estimates

Stakeholder Relationship Management

Toronto Hydro maintains close working relationships with City and industry partners to ensure cooperative structures are in place to carry out safe and effective response. These include relationships with first responders and City agencies, as well as with regional utility partners.

City Emergency Management

Toronto Hydro is a member of the City of Toronto's Emergency Management Program Committee and Emergency Management Working Group. As a member of these groups, Toronto Hydro actively participates in planning/preparing for whole-of-community response to emergencies impacting the City of Toronto. The groups encompass all agencies, boards, commissions and key partners who play a role in major emergency response within the City. Some of these include:

- City of Toronto Office of Emergency Management
- Toronto Water
- Toronto Fire Services

- Toronto Police Services
- Toronto Emergency Medical Services
- Toronto Transit Commission
- Toronto and Region Conservation Authority

Utility Partner Relationship Management

Restoring power after a major storm is a complex task, and a speedy restoration requires significant logistical expertise, along with skilled line workers and specialized equipment. Electric companies affected by significant outages often turn to the industry's mutual assistance network—a voluntary partnership of electric companies from across the country—to help speed restoration.

Mutual assistance is an essential part of the electric power industry's service restoration process and contingency planning. The mutual assistance network is a cornerstone of electric utility operations during emergencies.[22] Toronto Hydro is a member of three major mutual assistance groups:

1. North Atlantic Mutual Assistance Group (NAMAG)
   The NAMAG is a group of over 30 utilities from across northeastern North America. These utilities work together during major disruptive events to exchange resources and/or internationally during large-scale emergencies.

2. Ontario Mutual Assistance Group (OnMAG)
   Toronto Hydro and Hydro One have partnered with the CEA to establish an Ontario-specific mutual assistance group for Ontario's Local Distribution Companies. The aim of this group is to bolster capabilities within the province to respond to province-specific emergencies. The OnMAG is currently in its pilot phase.

3. Canadian Mutual Assistance Group (CanMAG)
   The CanMAG consists of Canadian electricity industry companies and is coordinated through the CEA. The purpose is for these companies to work together during emergencies including, but not limited to, those caused by storms and natural disasters.

Emergency Preparedness for Customers

Toronto Hydro continues to promote emergency preparedness for our customers. In 2020, Toronto Hydro provided customers with emergency preparedness tips and advice through direct outreach campaigns via newsletters, email, social media and more. Toronto Hydro also translated its Emergency Preparedness Guide into eight additional languages to help meet the diverse needs of our customers.

[22] https://www.eei.org/issuesandpolicy/electricreliability/mutualassistance/Pages/default.aspx