2017 Toronto Hydro Environmental Performance Report

Environment, Health and Safety

3/21/18

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 owns and operates an electricity distribution system and engages in Conservation and Demand Management (CDM) activities; and Toronto Hydro Energy Services Inc. (THESI), which provides street lighting and expressway lighting services in the City of Toronto. (THC, THESL and THESI on a consolidated basis are referred to as "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, urban forestry, and utilization of emerging green technologies as appropriate.

Toronto Hydro operates an integrated Environment, Health and Safety (EHS) Management System allowing efficiencies to be realized by building on synergies and eliminating duplication and redundant processes. In November 2017, Toronto Hydro underwent and passed an external audit to upgrade its existing Environmental Management System certification from the International Organization for Standardization's 2004 Environmental Management Systems Standard (ISO 14001:2004) to the 2015 version of the standard (ISO 14001:2015). Additionally, the audit confirmed that Toronto Hydro has continued to maintain its Occupational Health and Safety Assessment Series Standard for Occupational Health and Safety Management Systems (OHSAS 18001:2007) certificate. No findings were identified during this audit, with the auditor specifically recognizing the management element of Toronto Hydro's system as benchmark status.

An update to Toronto Hydro's environmental policy was required as part of the upgrade to ISO 14001:2015. The updated environmental policy also included a commitment to mitigate the impacts of climate change on the organization in order to satisfy the City of Toronto's requirement for a climate adaptation policy.

This marks the fifth consecutive year that Toronto Hydro has been certified to stringent internationally recognized standards for environmental and occupational safety management systems. Toronto Hydro is committed to continually meeting these internationally recognized standards and verifying conformance through a third-party independent audit process. In addition, Toronto Hydro is only one of four electrical utilities in Canada to be awarded the prestigious Sustainable Electricity Company designation by the Canadian Electricity Association (CEA).

Overall, Toronto Hydro continues to strive to achieve zero injuries and remain a sustainable electricity company. The Company regularly monitors and assesses its energy consumption, waste streams and procurement practices in an effort to reduce its environmental footprint and improve organizational 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; offering online billing to reduce paper consumption; and offering a variety of commercial and home energy efficiency programs.

As a testimony of its long-standing commitment to sustainability, Toronto Hydro was awarded first place by Corporate Knights on their Future 40 ranking. The Future 40 ranking is a prestigious, annual ranking that is recognized internationally, designed to showcase Canada's emerging sustainability leaders.

Additionally, Toronto Hydro's President and CEO, Anthony Haines, received three prestigious sustainability awards in 2017. CR Magazine awarded Mr. Haines with the Responsible CEO of the Year (Municipal/Nonprofit). This award is presented to CEOs that visibly exceed standards in the areas of employee relations, environmental impact, sustainability, human rights, philanthropy and corporate responsibility practices. Mr. Haines also received the 2017 Individual Leadership on Sustainability Award from the Canadian Electricity Association (CEA) for outstanding leadership on sustainability issues within the electricity sector. Finally, Mr. Haines was named to the Clean16 group of leaders by Delta Management Group, which recognizes outstanding contributors to clean capitalism.

Energy Use and Greenhouse Gases

Toronto Hydro operates in an environmentally responsible manner consistent with the City's Climate Change, Clean Air and Sustainable Energy Action Plan[1]. The City has established targets to reduce greenhouse gas (GHG) emissions by 30% by 2020 and 80% by 2050. Toronto Hydro is supporting these goals by reducing its own GHG emissions associated with its fleet, facilities, line losses, releases of sulphur hexafluoride (SF_6) gases, and facilitating the transformation to a carbon-free city through the electrification of activities and equipment currently powered by fossil fuels.

GHG emission reductions through Toronto Hydro's CDM activities are covered in the CDM section of this report. 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 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) and chilled water (facilities). Scope 3 emissions consist of all indirect emissions (not included in Scope 2) that occur

[1] City of Toronto's Climate Change, Clean Air and Sustainable Energy Action Plan: Moving from Framework to Action (June 13, 2007).
[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 and Climate Change, Guideline for Greenhouse Gas Emissions Reporting, available at http://www.ontario.ca/ministry-environment-and-climate-change.
[3] The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard (World Resources Institute and World Business Council for Sustainable Development), available at http://www.ghgprotocol.org/files/ghgp/public/ghg-protocol-revised.pdf.

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 the provincial values[4] representative of Ontario's energy supply mix and measured in tonnes of carbon dioxide equivalent emissions (tCO_2e) per gigawatt-hour.

Organizational Boundaries

The following change is reflected in the modified organizational boundaries for 2017: Toronto Hydro moved out of one of its leased buildings midway through the year and as such, the electricity and natural gas uses for this facility subsequent to the move have not been included in this report.

Data Sources and Assurance

Facilities Energy Data – The energy consumption data (electricity, natural gas and chilled water) is gathered from utility providers for all Toronto Hydro owned and controlled work centres. This building-specific energy consumption data populated in a database (the "Sustainability Performance Indicators" database). Facility energy billing data is comprised of digital files for electricity, paper bills from utility companies for natural gas, and consolidated billing files from third-parties for leased buildings.

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

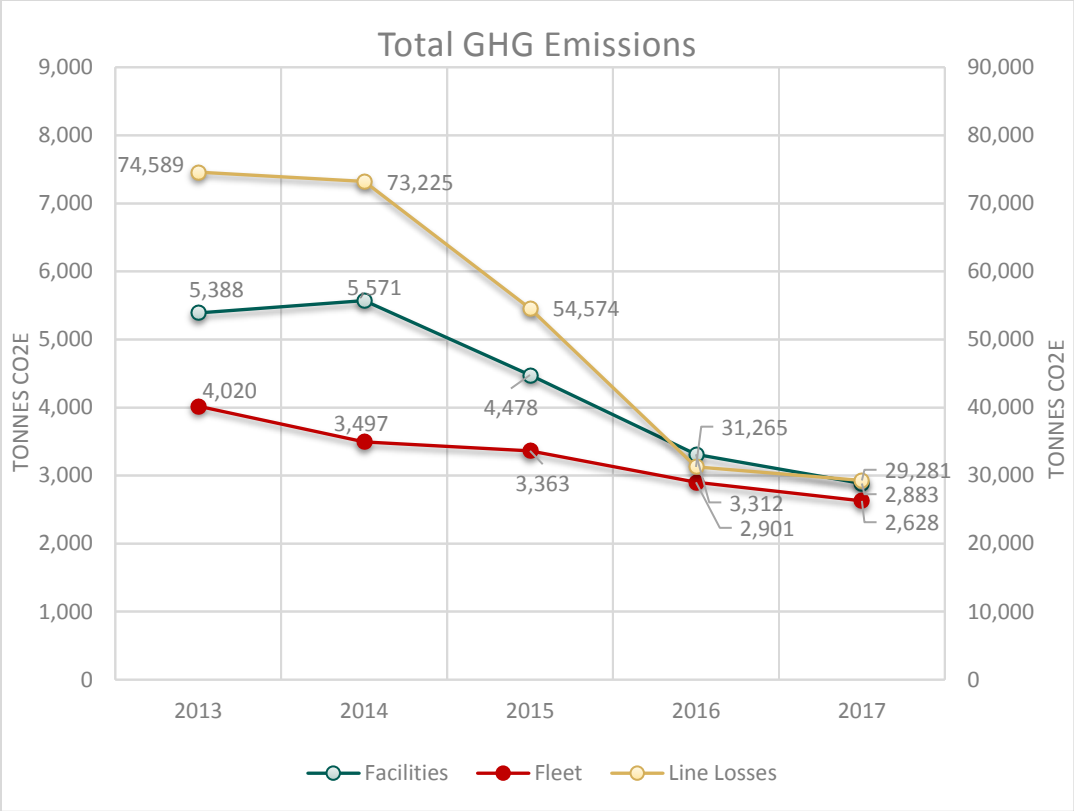
Fleet Fuel Data – A similar process to the facilities energy data collection and assurance is used for the fuel consumption data of the motor vehicle fleet. The Sustainability Performance Indicators database is populated from various datasets acquired from fuel suppliers and through paper billing statements.

SF_6 Emissions Accounting Process – In 2015, Toronto Hydro successfully implemented its revised SF_6 Inventory and Emissions Management Procedure, consisting of weighing SF_6 cylinders against a baseline value on an inventory basis. Emissions from decommissioned and retired equipment were calculated by subtracting the mass (in kilograms) of SF_6 gas from approved recycling vendor reports and from the equipment nameplate capacity. Emissions from damaged but repairable equipment are included in the total equipment use emissions. This methodology for tracking SF_6 inventory and reporting SF_6 equipment emissions has improved the accuracy and consistency of the information reported. The SF_6 data for 2017 was not available at the time of this report as Toronto Hydro's SF_6 disposal company, Green-Port Environmental, was not able to provide the necessary data in time. This information will be added to the GHG Inventory as it becomes available.

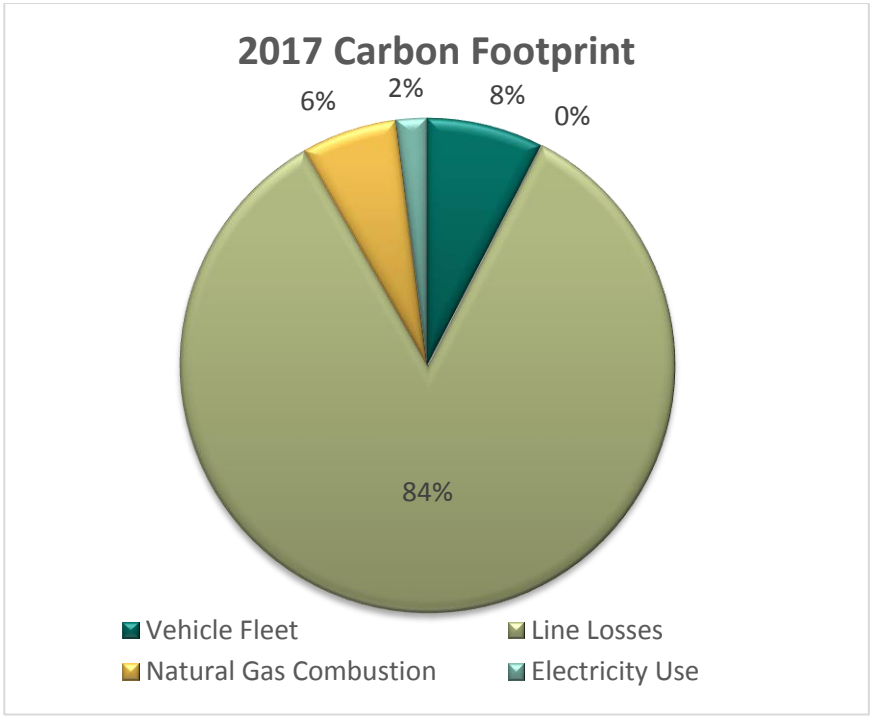
Results and Analysis

Toronto Hydro's 2017 GHG emissions, excluding SF_6, were 34,792 tCO_2e, a decrease of 7% relative to 2016. Below is the historical data on Toronto Hydro's GHG emissions by source (i.e., facilities, fleet and line losses). Please note that the historical SF_6 data has been excluded as the data in unavailable for 2017 (see above). Historically, SF_6 has represented 1% to 7% of the total GHG emissions.

[4] Emission factors published in Environment Canada's National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada.



The make-up of the carbon footprint, shown in the following diagram, is as follows: 84% of the emissions attributed to line losses, 8% is attributed to fleet emissions, while facilities (electricity and natural gas use) are responsible for 8%.



The fleet fuel consumption and associated emissions decreased by approximately 9% relative to 2016 and by approximately 35% relative to 2013. This is the result of continued efforts to reduce the number of vehicles and optimize their use (see details in "Fleet Related Initiatives" section below), the implementation of the Idle Management System (Governor to Reduce Idle and Pollution - GRIP), as well as the creation of portable and satellite work sites in close proximity to capital project locations. For additional benefits, such as reduction in idling time, fuel use and kilometres travelled, please refer to the Environmental Initiatives section.

The total electricity use (in kWh) and natural gas use (in m^3) in Toronto Hydro facilities decreased by 12% and 11%, respectively from 2016. These improvements were largely due to the energy efficiency projects implemented in 2017 (see the Facility Improvements section).

The 15% and 6% decrease in total GHGs from electricity and line losses, respectively, are partially attributed to the lower provincial emission factor (the electricity mix in Ontario was less GHG intensive in 2017 relative to 2016 and 2015[5]). Additionally, a multi-year program to increase the efficiency of the distribution system has contributed to reduced GHG emissions from line losses. Toronto Hydro is replacing less efficient 4.16 kilovolt (kV) infrastructure with a more efficient 13.8 kV and 27.6 kV infrastructure.

Environmental Initiatives

Facility Improvements

As part of its facilities consolidation program, aimed at making better use of space at existing work centres, in 2017, Toronto Hydro completed construction at 715 Milner Avenue. As a result, the Company moved out of a leased building at 601 Milner Avenue and into an owned building. The new facility was built on a brownfield site (a former car parts distribution facility) and utilized much of the original building's structural steel and concrete. This new building has incorporated Toronto Hydro's new building and facility standards, including the elimination of desk side waste bins, use of energy efficient lighting and Information Technology (IT) equipment, low volatile organic compound (VOC) paints and carpets, and standardized office furniture to reduce ergonomic risks. More effective use of office space has resulted in an approximately 44% reduction in Toronto Hydro' space utilization per employee relative to 2012.

The following are some key facts related to the 715 Milner Avenue construction project:

1. Re-used 35 tonnes of existing furniture, recycled 38 tonnes of furniture and resold or donated 24 tonnes of furniture. The donated furniture was given to organizations such as the Toronto Furniture Bank and Habitat for Humanity. Only 14 tonnes of furniture were sent to landfill. In total, 88% of the furniture from the building at 601 Milner was diverted from the landfill.
2. A variable air volume air handling system combined with multi-staged direct expansion cooling and perimeter radiant heating ceiling panels provide optimal comfort conditions for occupants

[5] National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada - Decreasing energy generation from coal and oil, accompanied by an increase in hydro, nuclear, solar and wind generation, was the largest driver of decrease in emissions associated with Electricity Production between 2005 and 2015.

3. A demand control ventilation system is used to maximize indoor air quality and air handling system efficiency.
4. A Building Automation System (BAS) that controls and monitors core building systems (HVAC, lighting, water supply, life safety systems & security etc.) help ensure safe working conditions and prevents business interruptions by identifying and addressing building related issues proactively.
5. Dedicated parking spaces have been assigned for carpool vehicles.
6. Low flow toilets and faucets were installed to reduce water consumption.
7. Occupancy sensors were installed for lighting in order to conserve electricity.

In addition to the Facilities consolidation program, Toronto Hydro undertook a number of energy efficiency projects at its 500 Commissioners work centre in 2017. One of these initiatives was the activation of a BAS at the work centre. The BAS automated the activation of the HVAC systems and eliminated unnecessary heating and cooling through the building. In total, this project is expected to save 190,000 kWh and 9.5 tCO2e emissions on an annual basis. Additionally, the lighting in the fleet repair garage was upgraded to high efficiency LED lightbulbs. This project is expected to reduce energy consumption by 97,000 kWh and reduce emissions by 4.85 tCO2e per year.

Complementing the aforementioned initiatives, departmental metrics such as reduction of energy use, square footage and GHGs are monitored monthly as part of Toronto Hydro's Operational Support Services scorecard.

BOMA BEST Silver Certification – 500 Commissioners

In 2017, Toronto Hydro achieved BOMA BEST Silver Certification at the 500 Commissioners work centre from the Building Owners and Managers Association of Canada (BOMA Canada). The certification is a national program that recognizes and rewards environmental leadership. Toronto Hydro intends to pursue similar certification at the work centres located at 71 Rexdale and 715 Milner in the future.

Fleet-Related Initiatives

Toronto Hydro operates a large fleet of vehicles, which are a potential source of environmental impacts. Engine operation inevitably leads to waste, such as waste vehicle fluids and waste vehicle components (e.g. batteries, engine parts, etc.). It also can lead to the emission of GHGs. Toronto Hydro has undertaken a number of initiatives to reduce engine operation, thereby decreasing the associated waste and emissions while increasing the life cycle of vehicles. These initiatives provide value to the residents of Toronto by reducing pollution, engine noise, odours and increases value to the shareholder and ratepayers by extending the life cycle of vehicles and reducing repair and maintenance costs.

Anti-Idling Technologies

In 2017, Toronto Hydro continued its use and installation of the Governor to Reduce Idle and Pollution (GRIP) technology on Toronto Hydro vehicles. The GRIP technology has been installed on 29 cube vans, 19 bucket trucks and five pick-up trucks since the use of the technology began in 2014. This led to a 36% decrease in idling time for cube vans. This is based on comparison with other cube vans without the GRIP technology.[6] A comparison of pick-up trucks with historical data demonstrated a 46% decrease in

[6] The GRIP technology was installed on new cube vans and no historical data was available.

idling time in 2017 compared with average time prior to GRIP application.[7] The idling data from bucket trucks is not yet available.

The GRIP system functions by shutting the engine off after one minute of idling, in accordance with the City of Toronto bylaw, and deferring to the auxiliary battery power source requiring long-lasting batteries in order to fully optimize the GRIP system's use. While the technology has delivered proven idling reductions, there is potential to realize more benefits by increasing battery life through the introduction of lithium ion batteries. In 2017, Toronto Hydro implemented a pilot project to test the effectiveness of lithium ion batteries in vehicles. This project has been conducted in collaboration with Centennial College and eCamion. The expectation is that the lithium ion battery will reduce the amount of idling time required and last longer than the current lead acid battery. This would further reduce the emissions associated with idling, as well as reducing the amount of waste batteries. The pilot project will continue into 2018.

Toronto Hydro also trialed the use of electric power take-off (ePTO). In order for the power take-off (PTO) to function, the bucket trucks require the engine to be running, resulting in emissions any time a bucket is used. The ePTO would run off a lithium-ion battery and has been proven to greatly reduce the emissions from PTO use. As the ePTO technology evolves and becomes more cost effective, Toronto Hydro will consider its use on more bucket trucks.

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 7.2 tCO_2e in 2017.

Reporting and Awareness

In order to raise awareness, in 2017, Toronto Hydro expanded the monthly reporting system that communicates idling metrics to all supervisors. Communications emphasizing the importance of idling reduction were also distributed throughout Toronto Hydro.

Downsizing

The most significant impact on reducing fuel consumption, idling hours, and GHG emissions is attributed to downsizing the fleet. In 2017, Toronto Hydro reduced its fleet by 12 vehicles.

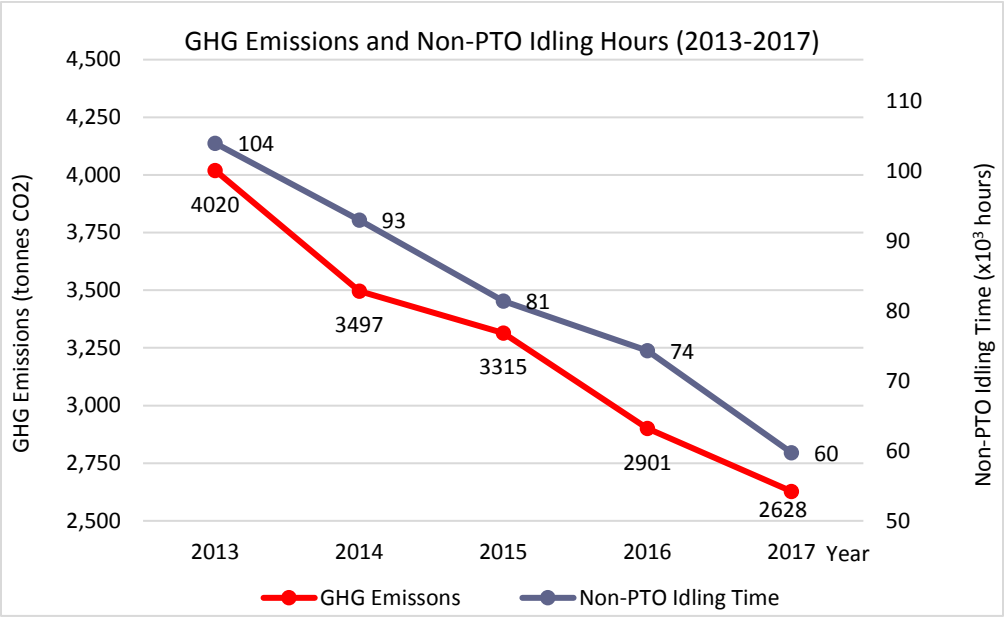
As a result of the fleet related initiatives, Toronto Hydro saw a 9% reduction in fuel use (106,460 L) and a reduction in GHGs of 273 tCO_2e, in 2017 relative to 2016. The fuel savings also resulted in an estimated $118,490 of savings.

The cumulative 2017 savings, relative to 2013, associated with the fleet related initiatives mentioned above are: 36% reduction in total fuel consumed (approximately 580,000 L); 35% reduction in GHG emissions (1,392 tCO_2e); 0.4% reduction in kilometres travelled (approximately 13,350 km); and 43% reduction in total non-PTO[8] idling hours (approximately 44,300 hours). The graph below illustrates the

[7] For pick-up trucks, the GRIP application was installed on vehicles already in service and historical data was available.

[8] 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.

correlation between the decrease in idling time and GHG emissions from vehicles. This is equivalent to approximately $645,540 of savings.



Smart Commute

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

Recognizing the importance of sustainable workplace commuting, Toronto Hydro has partnered with Smart Commute since 2015 to provide programs and services to support efficient and sustainable commuter options to employees at the 14 Carlton and 500 Commissioners work centres (the plan is to extend the program to all four work centres in 2018). As a part of the initial program evaluation, Toronto Hydro conducted a questionnaire in 2015 to understand the commuting practices of employees. A follow-up questionnaire was designed in 2017 to provide an update on employee commuting data collected as a part of the baseline questionnaire.

Carpooling, public transit and cycling were identified by employees as the top three alternative modes of travel they are willing to try. However, overall interest in carpooling was significantly greater than interest in the other two modes of travel, with more than 50% of employees expressing willingness to try carpooling.

Toronto Hydro employees identified finding a carpooling partner as a major factor influencing their decision to carpool. Therefore, Toronto Hydro is launching a campaign in 2018 to assist employees with carpool matching. Additionally, Toronto Hydro has designated carpool parking at work centres to encourage drivers to carpool more often.

Electric Vehicles

One of the largest sources of GHGs in Toronto are vehicles. In fact, the City of Toronto has stated that approximately one-third of the emissions in Toronto are from vehicles. The City has 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 by 80%. Toronto Hydro is supporting the transition to electric vehicles by increasing the availability of charging stations for electric vehicles to the residents of Toronto, as well as Toronto Hydro employees.

Projects to install on-street charging stations throughout the City began in 2017. The Residential On-Street project has been designed to offer charging stations in areas where residents are not able to install charging stations in their homes. Specifically, the areas targeted through this project are streets where residents rely on street parking. The Urban On-Street project will include the installation of charging stations on Wellington Street and Elizabeth Street in downtown Toronto.

In order to encourage employees to transition to electric vehicles, Toronto Hydro has begun installing charging stations at work centres. Four charging stations were installed at the 500 Commissioners Street location in 2017 and there are plans to install charging stations at 71 Rexdale Boulevard and 715 Milner Avenue. The installation of the stations at these two locations will begin in 2018. Toronto Hydro is also demonstrating leadership in the electrification of transportation through a project initiated in 2017 to replace small cars in the Toronto Hydro fleet with fully electric vehicles.

Toronto Hydro is also advancing the transition to electric vehicles through participation in various working groups and associations. The Electric Vehicle Working Group is facilitated by the City of Toronto and consists of representatives from various City divisions as well as Toronto Hydro and the Toronto Zoo. Toronto Hydro provides expert input on the electrification of transportation through this working group. Toronto Hydro also contributes to the work to electrify transportation conducted by Canadian Urban Transit Research & Innovation Consortium.

Tree Planting

On an annual basis, Toronto Hydro hosts a 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 environmental in Toronto. In 2017, Toronto Hydro employees, along with their friends and families, planted 300 trees and shrubs at Earl Bales Park. Since 2004, more than 4,300 trees have been planted across the city through this partnership.

Reducing Hazardous and Non-Hazardous Waste

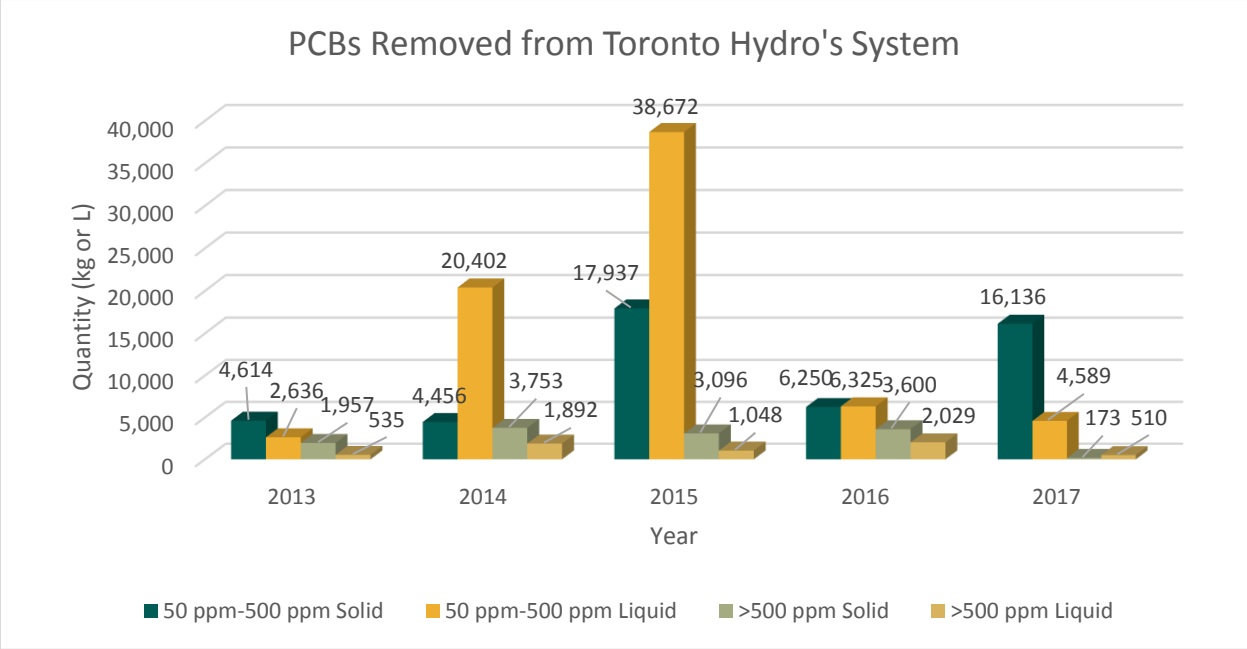
Similar to most electrical utilities in Canada, Toronto Hydro owns and operates equipment that has oil containing polychlorinated biphenyls (PCBs). The operation of this equipment is compliant with the PCB Regulations under the *Canadian Environmental Protection Act, 1999*. In recognition of the persistent ecological effects of PCBs, Toronto Hydro is actively removing and safely destroying equipment and oil containing PCB's in excess of the standards prescribed by federal and provincial laws.

This removal and destruction has been accelerated in recent years and has been enabled by proactive inspections of equipment suspected of having oil containing PCBs and testing of oil in equipment for the presence of PCBs. In addition, Toronto Hydro completed a capital replacement program to replace

submersible transformers in the distribution system that were manufactured prior to 1986. Most submersible transformers of this vintage, which at the beginning of 2016 amounted to approximately 900 units, are suspected of having oil containing PCBs. At the end of 2017, a total of 916 of these units had been replaced. The objective of the program was to eliminate the risk of submersible transformers from leaking oil containing PCBs into the natural environment.

The submersible transformer replacement program has likely contributed to an increase in the amount of PCB material safely destroyed in 2017. The amount of material sent for destruction increased by approximately 6,400 kilograms compared to 2016. In total, approximately 16,300 kilograms of material and 5,100 litres of liquids containing PCBs were sent for destruction in 2017.

The graph below displays the trend in removal and destruction of equipment and oil containing PCBs since 2013 and reflects the accelerated effort to remove this substance from the system.



Toronto Hydro tracks Recycling Rate as a Key Performance Indicator. The recycling rate is the percentage of the total waste generated by Toronto Hydro that is sent for recycling.

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.

To date, increases in employees' participation in effective source separation has led to an increase in the amount of waste diverted from landfill from 49% in 2013 to 67% in 2017.

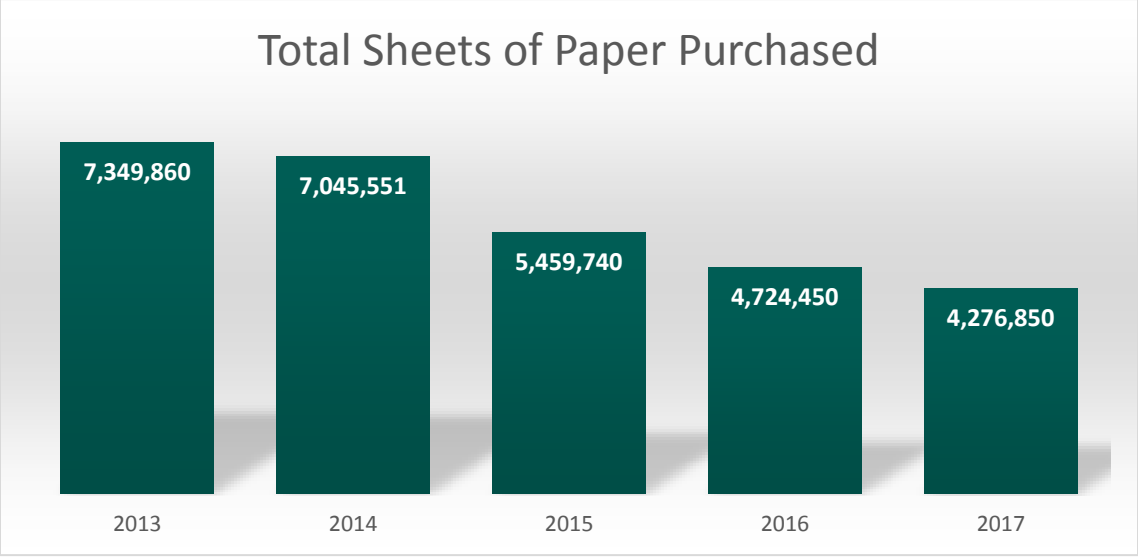
In addition to recycling solid non-hazardous waste from its facilities, Toronto Hydro has been recycling wood poles removed from service, fluorescent lights, batteries and electronic waste (e-waste). In 2017, Toronto Hydro diverted 535 metric tonnes of wood poles from landfill, compared to 490 tonnes diverted in 2016.

A corporate waste recycling rate was developed in 2017 to account for a broader pool of waste streams including metals from transformers and cables, as well as the waste streams mentioned above. The purpose of the corporate waste recycling rate is to provide a more comprehensive picture of the diversion efforts of the company. This data is reported on a quarterly basis on the Toronto Hydro website. The 2017 corporate waste recycling rate was 93%.

Reduction of Paper Consumption

The key to reducing waste is eliminating consumption of the materials that generate waste. In 2017, Toronto Hydro implemented the use of secure pull printing. In order to print, employees need to use their access card at the printer. This ensures all printed documents are collected from the printer, thereby reducing wasted paper and the associated printer maintenance costs. It also allows employees to make corrections if they print the wrong document or an entire document when only a page or two was required. Pull printing can also increase productivity as employees can send multiple jobs to the printer over the course of the day and retrieve the documents all together at the end of the day or the start of the day rather than one by one.

Toronto Hydro also implemented the use of tablets for issuing and completing facilities related work orders. Previously, work orders were issued on paper and submitted for filing once they had been completed. The initiative increases the efficiency of tracking work order completion while eliminating the use of paper. When combined with similar initiatives carried out in earlier years, Toronto Hydro has reduced annual consumption of paper by approximately 3,073,000 sheets in 2017. This equates to savings of approximately 39 tCO_2e[9] of associated GHG emissions and approximately $21,800 in 2017 when compared to 2013. These savings do not include other costs such as storage and transportation of paper records.



[9] Paper life cycle emission factor based on Environmental Paper Network – Paper Calculator.

Energy Conservation and Demand Management

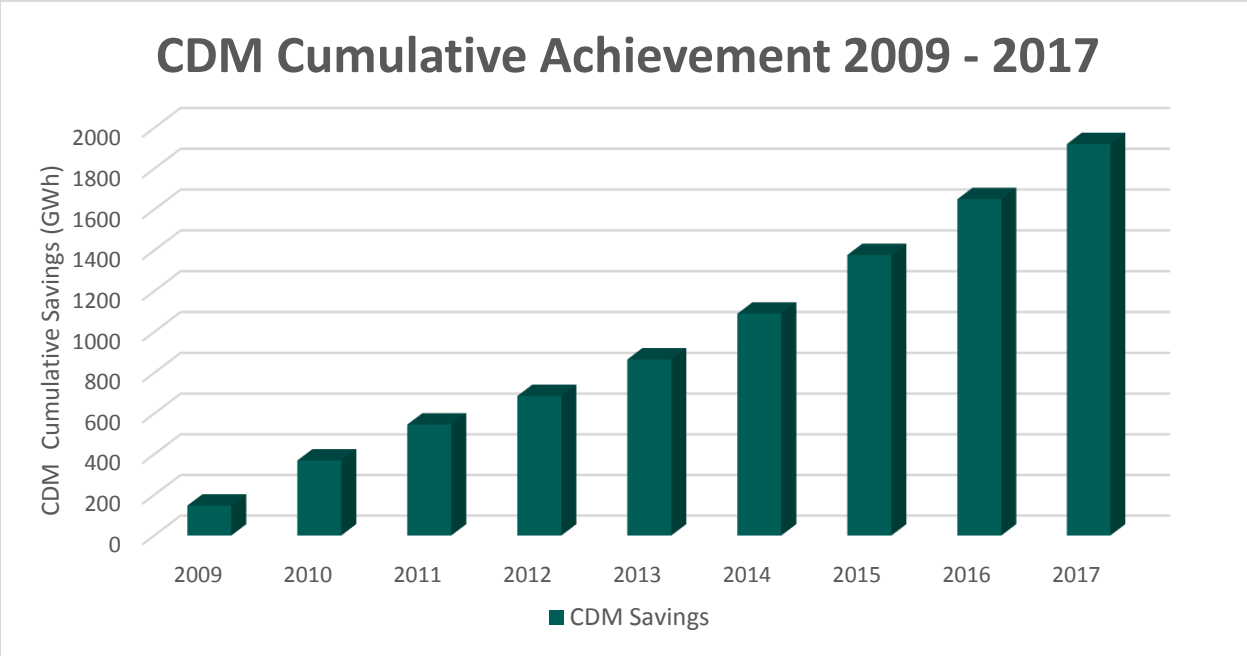
Toronto Hydro operates in a manner consistent with the City's Sustainable Energy Strategy[10], which includes targets to reduce electricity system demand by 550 MW and increase renewable generation by 550 MW by 2020. Toronto Hydro supports the achievement of these targets through a variety of programs involving municipal and provincial partners, regulatory partners, industry partners and customers.

Conservation Results

Toronto Hydro is one of the largest contributors to the Ontario Ministry of Energy's (MOE) provincial CDM mandate.

In 2017, Toronto Hydro continued to work with residential, small business, industrial and commercial customers to implement energy-efficiency projects. Toronto Hydro's 2017 CDM programs led to an estimated energy savings of 353,000 MWh[11] and reduced summer peak demand by 43 MW. These initiatives also helped to reduce GHG emissions in the city by 14,120 tCO_2e.[12]

Since 2009, through its CDM initiatives, Toronto Hydro has helped its customers reduce annual electricity consumption by 1,920 GWh[13] and reduce GHG emissions by 76,818 tCO_2e.[14] During the same period (since 2009), Toronto Hydro's CDM programs helped customers reduce their peak demand by 324 MW[15], representing 59% of the City's 2020 goal.



[10] The Power to Live Green: Toronto's Sustainable Energy Strategy (October, 2009).
[11] 2017 CDM energy and peak demand savings have not yet been verified by the IESO.
[12] Estimate using 2015 Ontario emission factors published in Environment Canada's National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada.
[13] The energy and peak demand savings represent cumulative totals but do not account for savings persistence.
[14] Supra note 11.
[15] The peak demand savings do not include achievement from demand response programs.

Shaping Provincial Conservation Directives

Toronto Hydro is also a leading member of the Conservation First Implementation Committee (CFIC), serving as the co-chair with the Independent Electricity System Operator (IESO). This group of Local Distribution Companies (LDCs), the IESO, and other related industry representatives has been guiding the implementation of the 2015-2020 Conservation First Directive, issued by the MOE in 2014 as an extension to the 2011-2014 SaveONenergy CDM framework. Toronto Hydro also has a strong presence on all of the supporting working groups and committees aimed at satisfying the mandate to achieve the targeted savings.

The Conservation First Framework is an integral part of the province's Long-Term Energy Plan (LTEP). The LTEP includes a 7 TWh reduction in electricity consumption in Ontario by 2020, resulting from conservation programs delivered by LDCs. Toronto Hydro has been allocated the largest electricity savings target in the province at 1.58 TWh.

In response to this significant challenge, Toronto Hydro has worked to develop and launch five new local and regional CDM programs in 2017. These programs are in addition to the various programs offered in previous years. The following CDM programs were launched in 2017:

PoolSaver – an incentive program for residential customers to replace a constant-speed pump with a variable-speed pool pump. Variable speed pumps only run at the speed required for the job. This reduces the amount of electricity required for the pump and the associated GHGs. It also extends the life span of the pump, thereby reducing the need to replace and dispose of pumps on a more frequent basis.

PowerLens – a program that delivers home energy reports and offers an online tool that allows customers to see when and how electricity is used at home. Through this system, customers can set goals, track progress, create action plans and earn points for saving energy wisely. These points can be redeemed for online gift cards at popular retailers such as Starbucks, Sephora, Best Buy and others.

Business Refrigeration Incentive – an incentive program to upgrade refrigeration systems at businesses. A rebate of up to $2,500 is available for eligible measures, including condenser cleaning, night curtains on display cases and strip curtains on walk-in coolers and freezers. In order to identify the best opportunities for conservation, the program also includes a free refrigeration energy audit.

RTUSaver - a program offered to businesses that includes a checkup of a rooftop unit, as well as recommended repairs and upgrades. Once the repairs and upgrades are complete, a free Wi-Fi enabled thermostat will be installed at the business. The program includes a service to program the thermostat based on occupancy.

OPSaver - a program designed for larger commercial, institutional, and industrial customers, which encourages continuous energy improvement through operational and behavioural change. Approved OPSaver consultants are assigned to work with building owners, managers, and operators to help strengthen corporate commitment to energy management, while participants are rewarded with incentives on a multi-year, "pay for performance" basis.

CDM Highlights

Retrofit Program

In 2017, Toronto Hydro's most successful initiative remained the Retrofit program. This program is the longest running CDM program in Ontario and consists of a wider range of eligible initiatives than any other CDM program. The program offers incentives to business customers to encourage investment in more energy-efficient equipment, including lighting, space cooling, ventilation, controls and various other measures. As a result of this program, 188,691 MWh of electricity was conserved in 2017. The GHG emissions reduction achieved in 2017 through this program was 7,548 tCO_2e[16].

High Performance New Construction (HPNC)

HPNC is a program that offers incentives to building owners and design decision-makers (architects, engineers, consultants, etc.) to build beyond Ontario Building Code requirements. Toronto Hydro and the City of Toronto work together in the delivery of this program. The HPNC program achieved 6,259 MWh in energy savings in 2017, resulting in 250 tCO_2e in GHG emissions.

Renewable Energy

Toronto Hydro has been supporting renewable generation across Toronto through enabling infrastructure and direct project investments. The initiatives described in the following section demonstrates Toronto Hydro's support of the City's renewable energy goal of installing 550 MW of renewable generation by 2020, including 166MW of solar PV generation.[17]

Enabling Infrastructure

Toronto Hydro provides enabling infrastructure for connecting renewable generation resources consistent with the provincial *Green Energy and Economy Act, 2009* and the Ontario Energy Board's Distribution System Code.

Toronto Hydro provides support including pre-assessments, connection impact assessments and Commissioning and Engineering support for renewable generation resources under a streamlined process. In 2017, Toronto Hydro enabled 150 microFIT (10kW or less in capacity) interconnections. This totals more than 1.2 MW of generation. During the same period, Toronto Hydro enabled a total of 38 FIT (greater than 10kW capacity) interconnections totalling more than 7.6 MW of generation. The last year for new FIT contracts to be offered was 2017.

Toronto Hydro has enabled more than 1,750 renewable generation interconnections totalling approximately 96.6 MW between 2009 and 2017, representing 18% of the City's 2020 renewable energy generation goal, and approximately 58% of the City's 2020 goal for solar PV generation. Assuming a specific yield of 1,100 kWh/kWp[18], these projects would produce 106.3 GWh and displace approximately 4,253 tCO_2e[19] annually.

[16] Estimate using 2015 Ontario emission factors published in Environment Canada's National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada.
[17] The Power to Live Green: Toronto's Sustainable Energy Strategy (October, 2009).
[18] kWp represents kilowatt peak, the maximum output of the system.
[19] Estimate using 2015 Ontario emission factors published in Environment Canada's National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada.

Development Projects

In addition to installing enabling infrastructure for customers' renewable energy projects, Toronto Hydro is directly investing in renewable generation and energy storage projects.

Investment

Toronto Hydro has jointly invested with the City in solar PV projects on City-owned facilities. These projects were separated into three groups (Group 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 2017, these projects generated 1,344 MWh and displaced 54 tCO_2e. Group B consists of 10 installations with a combined capacity of 1.5 MW constructed between 2015 and 2016. These installations generated 1,861 MWh and displaced 74 tCO_2e in 2017. 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 significantly more installations than the previous two projects. FIT contracts for 56 projects (40 FIT, 16 microFIT) were secured in 2016. The construction of all 16 microFIT installations has been completed, while construction on the FIT projects is ongoing. Included in the Group C installations are the solar panels at two Toronto Hydro owned facilities, 71 Rexdale Boulevard and 715 Milner Avenue. Toronto Hydro has majority ownership of these two installations, each with a 500 kW capacity. The construction of the installation at 71 Rexdale is complete, while the installation at 715 Milner was under construction at the end of 2017.

Toronto Hydro has previously invested in three other renewable generation projects (Exhibition Place Wind Turbine, Better Living Centre Solar and 500 Commissioners Street Solar) which, together, have an installed capacity of 1.2MW, generated 961 MWh and displaced 38 tCO_2e in 2017.

Community Energy Storage Project – Toronto Hydro has completed construction of a battery energy storage system with the technology company, eCamion, Canada's Sustainable Development Technology Corporation program and Ontario's Smart Grid Fund. The project uses lithium ion battery technology to store off-peak electrical energy for subsequent use during on-peak periods. The system is located at Toronto Hydro's 500 Commissioners facility and will provide demand response, price arbitrage, emergency power and power conditioning. The system provides peak capacity of approximately 500kW for up to one hour and supports business continuity.

Pole-mounted Energy Storage Project – Toronto Hydro has also worked with Ryerson University and eCAMION to pilot a pole-mounted energy storage unit. Similar to the previous energy storage projects, the purpose of the unit is to store energy during off-peak hours and release the power as required. The initial results of the project have demonstrated that the unit can reduce the strain on the local transformer, potentially increasing the lifespan of the equipment. The pole-mounted unit has a 15 kW/15kWh capacity. An additional benefit of the unit is it does not have a physical footprint because it is attached to existing poles.

Bulwer Battery Energy Storage System (BESS) Project - The Bulwer BESS project is a 2MW/8MWh Ontario Smart Grid Funded project that will be located at Bulwer Municipal Station (MS), a retired 4.16kV 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 infrastructure. The BESS will allow electricity to be provided to

customers when there is an issue with usual electricity supply, thereby increasing reliability of service to customers and decreasing downtimes. The BESS will also allow peak loads to be reduced and upgrades of expensive distribution utility equipment to be deferred. The project is being completed in partnership with *Renewable Energy Systems Canada and* is currently in the engineering design and pre-construction stage. The project is expected to be energized by the end of 2018.

Deltro Energy Inc. BESS (Basin 1 and 2) – This project consists of two, 2MW/6MWh Battery Energy Storage Systems (BESS) from Deltro Energy Inc. that will be connected to Toronto Hydro's 13.8 kilovolt Basin substation. The BESS project is funded by the IESO and is part of an initiative to increase usage of energy storage systems on the distribution and transmission grid. The Ontario power supply has shifted heavily towards intermittent power sources over the past three years creating additional grid management challenges for the IESO. The lithium battery storage project will improve stability on Canada's electrical grid by managing unbalanced supply-demand situations. With a response time of less than 300 milliseconds, these systems have the capability to react autonomously to signals from the IESO.

GHG Reductions Summary

As illustrated in the summary table below, in 2017, Toronto Hydro achieved a reduction in GHG emissions of 15,213 tCO_2e as a result of its CDM projects, renewable energy generation and operational initiatives (related to fleet and facilities) compared to 2016.

	Energy Saving	GHG Reduction[20]
CDM Projects 2009-2017	1,920 GWh	76,818 tCO_2e
CDM Projects 2017	353 GWh	14,120 tCO_2e
	Energy Generated[21]	GHG Reduction[22]

[20] Estimate using 2015 Ontario emission factors published in Environment Canada's National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada.
[21] Based on renewable generation projects Toronto Hydro has provided interconnections and enabled infrastructure for connecting renewable generation resources.
[22] Supra note 20.

Renewable Energy Generation Projects 2009-2017	106.3 GWh	4,253 tCO_2e
Renewable Energy Generation Projects 2017	9.79 GWh	391 tCO_2e
	Energy Reduction	GHG Reduction[23]
Facilities Energy Efficiency Projects 2017 (Electricity)	2.47 GWh	119 tCO_2e
Facilities Energy Efficiency Projects 2017 (Natural Gas)	163,740 m^3	310 tCO_2e
	Fuel Reduction	GHG Reduction
Fleet Fuel Efficiency Projects 2017	106,460 L	273 tCO_2e
	Energy Saving	GHG Reduction
Line Losses 2017	30.49 GWh	1,984 tCO_2e
	Paper Saved	Lifecycle GHG Reduction
Paperless Projects	447,600 sheets	5.7 tCO_2e[24]

Energy Security and Supply

Toronto Hydro is working to ensure adequate distribution capacity is available in Toronto. This work also supports the City's objective of ensuring infrastructure resiliency. Toronto Hydro is collaborating with Hydro One to mitigate the potential impact of high-risk events that could result from the unplanned loss of either Leaside or Manby transmission station (TS). Manby and Leaside TS are critical transmission supply points for central Toronto, supporting key financial and hospital customers. Approximately 1,200 MW peak demand is provided through Leaside TS and approximately 800 MW peak demand is provided through Manby TS.

Investing in the grid - Capital Expenditure Plan

Toronto Hydro's 2015-2019 capital program is designed to improve service reliability and address the need for additional distribution capacity. The program consists of four main investment categories: (1) System Access, (2) System Renewal, (3) System Service and (4) General Plant.

1. Investments in the System Access category are driven by statutory, regulatory or other obligations to provide customers with access to Toronto Hydro's distribution system. This category includes investments to connect renewable energy generation facilities, and metering-related investments to maintain compliance with Measurement Canada regulations and the IESO Market Rules.
2. Investments in the System Renewal category target the renewal and reconfiguration of distribution assets that are no longer performing at an acceptable standard. These programs focus on remediating assets that are at, near or exceeding the end of their useful lives, and assets that no longer align to current operating practices. This includes assets with accessibility

[23] Supra note 20.
[24] Paper life cycle emission factor based on Environmental Paper Network – Paper Calculator.

or serviceability conflicts (e.g. assets located in ravines, rear lots, highway crossings, etc.), which pose increased reliability and safety-related risks.

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 upgrade and renewal 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. Each year, the Company inspects more than 8,000 underground transformers to gather information about their condition and mitigate equipment failures that may adversely impact the environment. Information gathered in 2016 is currently being utilized to plan transformer replacements in the coming years. In addition, inspections in 2017 allowed Toronto Hydro to identify and proactively replace approximately 360 transformers that were in very poor condition and posed an environmental risk.

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 the 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 initially adopted this framework in the mid-2000s and has periodically reviewed and updated its RCM analyses ever since. In late 2015, Toronto Hydro began its next set of significant reviews and updates and this work continued through 2016 and 2017.

To help mitigate tree-related interference with Toronto Hydro wires, the Company employs modern arboriculture techniques to ensure proper care of trees as part of its Vegetation Management program. For example, when trees adjacent to a distribution line are pruned, adjacent distribution lines experience a reduction in power outages due to tree-related events. On average, Toronto Hydro has been pruning approximately 53,000 trees annually 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 such means as 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

In 2017, Toronto Hydro continued to implement a number of initiatives aimed at improving 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 initiatives and collaboration is to reduce the impacts of climate change on the residents of Toronto.

Climate Change Adaptation Road Map

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.

A significant portion of the road map was completed in 2016 and some of the initiatives continued into 2017. Highlights of the completed initiatives are:

Load Forecast Sensitivity Study – The station load forecast is prepared every year to provide a 10 year peak load forecast for each transformer station. This forecast evaluates if the capacity of each station is adequate and allows Toronto Hydro to plan future investments. The forecast considers numerous factors including economics, populations and temperatures. Previously, Toronto Hydro used historical temperature data in the forecast. This data did not account for the increased variability in temperature due to climate change. A more accurate load forecast has now been developed by using projected future temperature data rather than historical data.

Climate Data – Toronto Hydro continually reviews sources of climate data to verify that the 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.

Major Equipment Technical Specifications – Toronto Hydro completed a review of technical specifications used for the purchase of major equipment in order to assess whether there are any opportunities to enhance the Technical Specification to provide additional resiliency. The change in specifications for submersible transformers are an example of an outcome from this review. Toronto Hydro identified that submersible transformers (i.e. transformers designed to be in below grade vaults) need to be more resilient to the increased flooding expected as a result of climate change. As a result, the specifications for submersible transformers were changed to require that transformers be constructed from stainless steel, a material more resistant to corrosion. Toronto Hydro has also initiated a trial of solid dielectric submersible transformers that are designed to be more resistant to flooding and increased temperatures.

Support of the City of Toronto's Resiliency Goals

In 2017, Toronto Hydro continued working with participants of the Resilient City Working Group to identify areas of the grid that are vulnerable to extreme weather events and to improve information sharing processes to better prepare for major weather events and mitigate the impact on the City. A report was generated by AECOM summarizing the work completed by the Resilient City Working Group. The report was focussed on the coordination between various City agencies and other stakeholders to help mitigate the impacts of widespread outages.

One major accomplishment in 2017 was the acceptance of the City of Toronto to the 100 Resilient Cities Network. Membership in this international network allows the City to share knowledge and learn from the experiences of other members. The work conducted to increase resiliency includes preparations for the impacts of extreme weather. Toronto Hydro contributed to the City's acceptance into the network through its work in the Resilient City Working Group.

Toronto Hydro also supported a project to identify potential resiliency risks in the City of Toronto conducted by researchers at the University of Western Ontario. This project relies on input from various organizations in Toronto. Toronto Hydro provided information on the connections to the electrical

distribution grid to the researchers. The research will provide information that can be used to reduce the risk from climate change across the City of Toronto.

Participation in Industry Discussions

Toronto Hydro continued to participate in the CEA-led industry discussions about the awareness of climate change impacts in the electricity generation, transmission and distribution sectors. In 2017, a climate change adaptation planning guide for the electricity sector was developed by the CEA. Toronto Hydro was a significant contributor in the preparation of the guide. The Company's initiatives through the climate change adaptation roadmap positioned Toronto Hydro as a leader in the CEA discussions. Many of the recommendations in the CEA climate adaptation guide were practices Toronto Hydro had already implemented and was able to share knowledge of with other CEA members.

Additionally, Toronto Hydro is participating in 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. This project involves collaboration with many organizations across the industry and will continue into 2018.

Grid Emergency Management

In addition to increasing the resiliency of the grid to the impacts of extreme weather events, Toronto Hydro has developed a formal Grid Emergency Management (GEM) program to improve the response to extreme weather events. This program will continue to provide value as the city experiences weather events with increased severity, frequency and duration.

Grid Emergency Management Program

Over two days in December 2013, a freezing rain storm brought down more precipitation than would typically be experienced over two years in the Greater Toronto Area (GTA). The ice storm event was one of Toronto Hydro's largest and longest power restoration efforts. In January 2014, an Independent Review Panel (IRP) was established to oversee an assessment of the response to the ice storm to identify practices that worked well and areas of improvement, and to develop recommendations based on best practices and regulations implemented throughout the utility industry. A formal GEM program was established in 2014 to implement the recommendations identified by the IRP.

In 2017, the following initiatives were developed and incorporated into the GEM program:

- Playbooks containing emergency management plans for High Risk Capital Projects including Eglington Light Rail Transit (LRT)
- An awareness program for all Toronto Hydro staff providing a brief understanding of Toronto Hydro's emergency management program
- Seminars, training and table-top exercises with Senior Management to familiarize them with their roles and the organizations approach to emergency management

In addition, Toronto Hydro hosted a functional exercise for the first time, which included almost 90 employees and tested 38 emergency roles. This exercise allowed specific roles to be tested over an 11-hour simulation period and identify gaps in the plans.

Since implementation, the GEM program has incorporated the documentation of key operational processes, roles and responsibilities and developed analytical tools to improve emergency response and

customer communications. In order to ensure effective emergency management plans are in place, GEM focusses on three main areas: training and development, stakeholder relations and delivering mutual aid.

Training and Development - Training is a core function of the emergency management team. Toronto Hydro's emergency management team has made it a priority to integrate Ontario's Incident Management System (IMS) framework into the organization. The majority of Toronto Hydro's senior management and professional employees have received formal training on specific roles within IMS, and how the IMS is incorporated into day to day operations. The IMS framework has been tested through real-life scenarios, which has allowed Toronto Hydro to improve response and recovery efforts.

Working with the stakeholders - In 2014, Toronto Hydro joined Edison Electric Institute's mutual assistance program as a member of the North Atlantic Mutual Assistance Group (NAMAG). Toronto Hydro is also part of the Canadian Mutual Assistance Group (CanMAG), coordinated through the Canadian Electricity Association.

Locally, Toronto Hydro works with several GTA critical infrastructure and public safety groups including:

- Transportation (Toronto Transit Commission, Greater Toronto Airports Authority, Metrolinx)
- Energy and Utilities (Ontario Power Generation)
- Public Sector (Office of the Fire Marshal and Emergency Management, City of Toronto)
- Public Health (Scarborough & Rouge Hospital)

Mutual Aid - Toronto Hydro understands how important it is to help support our neighbouring utilities who need post-storm restoration efforts. Since joining NAMAG, Toronto Hydro has deployed crews to three different disaster areas: New Hampshire in November 2014, Upstate New York in March 2017 and Tampa, Florida in September 2017. The mutual aid response to Tampa to assist in the aftermath of Hurricane Irma was one of the farthest distances that Toronto Hydro has travelled.

Ultimately, through a long-term sustained effort, Toronto Hydro aims to improve its ability to efficiently and effectively respond to and recover from major grid disruption events, and to do so while providing customers and the community with timely and accurate information.

Emergency Preparedness for Customers

Emergency preparedness is a top priority for customers. In 2017, Toronto Hydro focused on encouraging customers to create an emergency preparedness kit. These activities took place through direct outreach campaigns via newsletters, brochures and community events, and public relations campaigns. Additionally, Toronto Hydro distributed more 1,590 emergency preparedness kits in 2017 to low income residents of Toronto.