Annual Report
2013 Environmental Performance

This report provides information demonstrating how Toronto Hydro Electric System Limited (THESL) meets the Shareholder's Direction requirements related to environmental performance and the provision of reliable, efficient electricity, consistent with the City of Toronto 's energy, climate change and urban forestry objectives.

ENERGY USE AND GREENHOUSE GASES

Background

THESL operates in an environmentally responsible manner consistent with Toronto's Climate Change Action Plan[1], thus supporting its greenhouse gas (GHG) reduction targets of 30% by 2020 and 80% by 2050. This is reflected in our initiatives aimed at reducing the energy consumption and GHGs associated with our fleet, facilities, line losses and the use of Sulphur Hexafluoride (SF_6). Furthermore, our corporate and/or departmental balanced scorecards include indicators that monitor our progress on these projects (e.g., reduced GHGs from fleet and facilities, reduced idling time, reduced office square footage, etc.).

GHG Accounting

Our GHG inventory includes Scope 1 and 2 emissions, quantified in accordance with national and provincial GHG reporting guidelines[2], and GHG Protocol – Corporate Accounting and Reporting Standard. As such, the organizational boundary of our GHG Inventory includes all THESL owned and controlled (leased) facilities.

The operational boundaries include Scope 1 and 2. Scope 1 are direct emissions from stationary combustion (facilities), mobile combustion (fleet) and fugitive sources (SF_6 and refrigerant leaks). Scope 2 are indirect emissions from the use of purchased electricity (facilities and line losses). Scope 3 emissions are not included in this GHG inventory.

The emission factors used to calculate the GHGs are the provincial values[3] representative of Ontario's energy supply mix, and measured in tonnes of carbon dioxide equivalent emissions per gigawatt-hour.

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[1] Change is in the Air: Climate Change, Clean Air And Sustainable Energy Action Plan (2007)

[2] Environment Canada's Technical Guidance on Reporting Greenhouse Gas Emissions, Ontario's Guideline for Greenhouse Gas Emissions Reporting

[3] Emission factors published in Environment Canada's National Inventory Report 1990-2011: Greenhouse Gas Sources and Sinks in Canada

Data Sources and Assurance

THESL's Operations Support Services department is responsible for gathering energy consumption data (electricity and natural gas (NG)) from utility providers for all THESL's facilities included in the organizational boundary described above. This building specific energy consumption data is used to populate the facilities' energy management database. A similar process is involved in the data collection for fleet fuel use where the fuel management database is populated with data from various fuel suppliers' database and paper billing statements. Lastly, the SF_6 data is retrieved from an equipment inventory database. The data contained within this report was obtained from these databases.

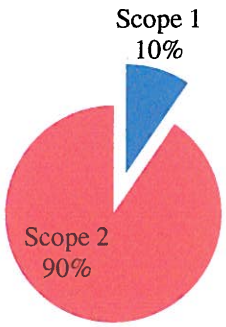
Facility energy billing data used in this report is comprised of digital files (for electricity), paper bills (for natural gas) received from the utility companies, and consolidated billing files from a third-party (for leased buildings). Given that our internal assurance process entailed a sample audit of select bill entries, there is a small potential for data entry errors. Additionally, the NG consumption for one of THESL's leased building was not available. For this facility, 2012 data was used instead. THESL is working with the landlord of this facility to improve the data collection process.

In 2013 we changed our organizational boundaries to include a building that was omitted from previous years' inventories. The 2012 Facilities footprint was adjusted to allow for a consistent comparative analysis. Additionally, we calculated the GHGs from refrigerant leaks and deemed them immaterial as being 0.05% of our facilities emissions.

While the quantification methodology used in 2013 for GHGs associated with SF_6 leaks doesn't follow the joint Canadian Electricity Association (CEA) - Environment Canada SF_6 Estimation and Reporting Protocol [4], efforts are made to change our estimation methodology for 2014 and beyond to be compliant with this guideline. Our SF_6 emissions were calculated by determining the SF_6 asset volume and multiplying with a leak rate of 1.9% (based on BC Hydro's 2002 leak rate).

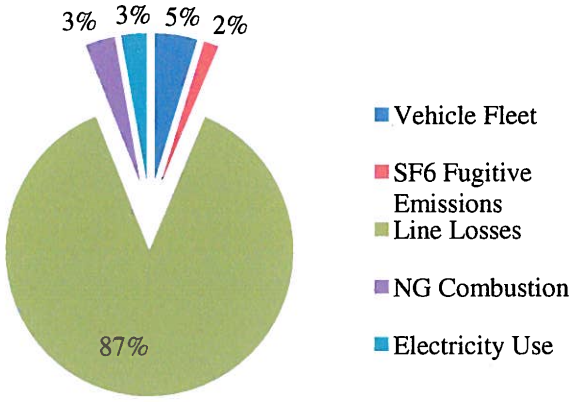
Results and Analysis

Our 2013 total GHG emissions were 85,150 t CO2e, a decrease of 30% relative to 2012. The split between Scope 1 and Scope 2 emissions is 90% and 10%, respectively (see figure below).



[4] Annex A: SF_6 Emission Estimation and Reporting Protocol for Electric Utilities

The make-up of our carbon footprint is shown in the next figure: 87% of our emissions are attributed to the line losses, while fleet and facilities (electricity and NG use) are responsible for 5% and 6%, respectively. The remainder 2% is associated with SF_6 fugitive emissions.



The fleet fuel consumption and associated emissions decreased by approximately 3% relative to 2012. This is the result of our continued efforts to reduce the number of vehicles and optimize their use, as well as by creating portable and satellite work sites in close proximity to new capital projects locations. The latter led to a reduction of approximately 10% in the time travelled by large construction vehicles.

Despite our Building Consolidation program launched in 2013 (discussed below), aimed at reducing the overall square footage, energy, GHGs and costs at our facilities, electricity and NG use in our facilities increased by 13.5 and 28.5%, respectively. The primary reasons for this are the colder winter conditions in 2013, renovation projects being done in some of the buildings as well as two major weather events, the flash flood (July 8th) and ice storm (December 22nd) that required longer operating hours for our facilities. Despite the upward electricity variance, the facilities' GHGs had a downward trend due to the lower provincial emission factor.

While our line losses remained constant compared with 2012 values, the associated GHGs decreased by 25% due to the lower provincial emission factor (the electricity mix in Ontario was cleaner in 2013 relative to 2012).

Despite the fact that our stations' SF_6 filled equipment count dropped (by 12%) due to equipment removal, our total SF_6 fugitive emissions increased by over 3% in 2013 compared to 2012. This is attributed to an increase (of 4%) in the SF_6 filled distribution equipment count and the use of more accurate data in our inventory database.

Environmental Initiatives

Building Consolidation Program

In an effort to minimize our facilities footprint and consolidate activities aimed at increasing our productivity, Toronto Hydro undertook a number of consolidation and renovation projects across the city.

The Facilities Renovation Standard was developed in order to ensure standardization of work centers layouts, furniture, materials, lighting options and equipment used in these renovations.

The standard details the specific products to be purchased during renovations, such as environmentally preferred products (including recyclable carpet with recycled content, dimmable LED lighting where practical, low/no-VOC paints, etc.). The standard office and work center amenities layouts aim to maximize productivity and to ensure efficient use of office space. Half height walls, large windows and the central atrium at our Commissioners Street facility take advantage of natural lighting reducing the need for daytime lighting and resulting in energy savings. Common waste and recycling receptacle bins (for waste, paper, bottles and plastic) have also been sourced and will be installed in 2014 at all our facilities.

Additionally, satellite work locations have started to be set up to accommodate the future closing of some of our facilities (for details refer to the next section).

Departmental metrics such as reduction of energy use, square footage and GHGs are measured for each project that is being implemented. These metrics are monitored monthly as part of our balanced scorecards. Recycling and waste diversion rates will also be monitored through regular waste audits. Performance on all these metrics is reported monthly to senior management.

Satellite Work Locations

Due to the pending sale and closure of one of our facilities (28 Underwriters Rd) there is a plan in place to move Toronto Hydro Staff currently working out of this location, to 5 satellite locations located across the city. The first of these satellite locations was opened at 7 Wiltshire Ave, in October of 2013. The remaining locations will be opened at a later date. Some of the benefits associated with the re-location to the satellite locations include improved response time, better customer service, increased productivity, reduced driving times, fuel usage/costs and associated GHGs.

Unlike the portable work sites which are temporary and project specific, these satellite centers will be permanent locations.

Portable Work Sites

In 2012, THESL created a temporary portable work site at 5800 Yonge Street to minimize the time and distance that large construction vehicles travel to capital projects. The benefits achieved from implementing this initiative include reduced driving time, fleet maintenance and fuel use/costs, as well as reduction of associated GHG emissions. This site will be closed, once the project it was created for is completed, in 2014.

Pool Vehicle Program

A pool vehicle program, initiated in 2013, placed over 60 specialty and lesser used vehicles and pieces of equipment (approximately 10% of the fleet) into a shared pool that could be signed out by crews, on an as-needed basis. This system provided crews with the opportunity to use only the specific equipment required for a specific task and the necessary vehicles. The program minimized the number of vehicles travelling to a work site and the corresponding emissions, while maximizing the productivity of our existing fleet.

Grid Response Printer Initiative

As part of this initiative, prototype printers were installed in different types of fleet vehicles in the System/Stations Response Departments. These devices allow field workers to print critical safety documents that are generated/revised by the THESL's control authority throughout their shift. Previously, these documents were obtained by driving to one of the THESL service centres. The printers have the potential to reduce the driving time by a conservative estimate of 1 hour for a 12 hour shift. The benefits associated with this initiative are improved response time, increased productivity, decreased vehicle maintenance costs and reduced fuel cost and associated GHGs and other contaminants. Following the user evaluation phase, THESL plans is to install these printers on the Grid Response trouble vehicles and Grid Response Supervisor vehicles, in 2014.

SF6 Recycling Pilot Program

Typical SF_6 equipment includes gas insulated circuit breakers, switchgear and transformers, all of which have a limited life expectancy. Understanding this, Toronto Hydro has established a recycling program to extract SF_6 gas from de-commissioned equipment prior to disposal. The 2013 Pilot Program removed and recycled 47 SF_6 switchgear, following an extraction of SF_6 gas into pressurized gas cylinders using SF_6 evacuation/reclamation equipment. As a result 17 lb of SF_6 was recovered and 184 tCO2e avoided. Toronto Hydro continues to work towards expanding its SF_6 management program, which will place stringent standards and procedures around tracking and managing SF_6 inventory and emissions across the organization.

Conservation and Demand Management Programs

Educating customers about conservation programs and incentives available to help them manage their electricity consumption remains an important area of focus for the utility. We're working with residential, small business and commercial customers to implement energy efficient tools that translate into real conservation and cost savings.

In 2013, THESL's conservation and demand management (CDM) programs led to an estimated energy savings of 109,828 MWh. These initiatives helped to reduce our customers' GHGs emissions by 10,673 tCO2e.

ENERGY CONSERVATION AND DEMAND MANAGEMENT

THESL supports the City's energy conservation and demand management (CDM) targets of reducing the electricity use by 550 MW by 2020 and of increasing the renewable (RE) generation by 550 MW, by 2020, as outlined in the City's Sustainable Energy Action Plan[5]. This is reflected in our CDM initiatives and the installation and support for the deployment of new renewable energy projects.

[5] The Power to Live Green: Toronto's Sustainable Energy Strategy (2009)

Conservation and Demand Management highlights

As a registered participant in the CDM programs saveONenergy™, Toronto Hydro receives funding from the Ontario Power Authority (OPA) to deliver such programs within our service territory. Through this funding model, Toronto Hydro invested approximately $46.3 million in conservation and demand management programs last year. In 2013, THESL achieved an estimated energy savings of 109,828 MWh and demand reduction of 54.56 MW.

One of the most successful conservation programs for THESL was the Equipment Replacement Incentive Initiative ("ERII"). The program's objectives are to offer incentives to business customers to encourage investment in more energy efficient equipment including lighting, space cooling, ventilation, controls and various other measures. Incentives were offered for projects where equipment and systems will be replaced with more efficient alternatives. Typical target segments for this initiative include commercial, retail, hospitality and entertainment, municipal, academic, health care, other institutional and multi-residential facilities.

Toronto Hydro developed a comprehensive front, middle and back office system to support this initiative. Technical energy consultants were hired to target all market sectors promoting ERII and assisting customers to identify energy savings opportunities and submit applications. THESL also contracted the City of Toronto Better Buildings Partnership as its channel subcontractor in the municipal, academic, social, and health care sectors to leverage long-standing relationships in those markets. As a result, we had 1,384 completed projects that resulted in 15.8 MW of net peak demand savings and 81,400 MWh of net energy savings. Verified results for 2013 will be available in September 2014 from the OPA.

Smart Meters

Toronto Hydro has completed the conversion of its meter population to Smart or Interval Meters with less than 80 non-smart meters remaining in the city. The total number of smart, suite and interval meters installed in 2013 was 12,238. Out of these, 200 were microFIT smart meters.

We capture validate and process 5 minute, 15 minute and 60 minute interval data daily for over 730,000 meter points. In addition to our traditional revenue meters we also capture and process interval data for bi-directional microFIT (Feed-in-Tariff) meters (solar power electricity generation, energy used and energy generated), and electric vehicle charging stations.

Toronto Hydro also supports individual metering for condominiums and commissioned 8,039 individually metered "suites" in 2013 (included in the smart meter count).

Renewable Energy

Toronto Hydro has been supporting renewable generation across Toronto by enabling infrastructure and investing in development projects, consistent with the City's Shareholder Direction. The following sections demonstrate THESL's progress towards renewable energy goals stated in The Power to Live Green (2009) of installing 500MW of renewable generation by 2020 and reaching 1000MW of renewable generation by 2050.

Enabling Infrastructure

The original target for renewable generation from the City's 2009 strategy, Power to Live Green, was 500MW by year 2020, of which Solar PV (photovoltaic) accounted for 166MW. There are currently 24MW of aggregate Solar PV projects in-service across Toronto, with an additional 65MW of committed Solar PV projects in progress.

Between 2009, when FIT 1.0 was launched, and December 31, 2013, THESL has enabled 579 microFIT connections (each under 10kW capacity) totalling over 3.2 MW of generation which accounts for an estimated 7% of rooftop microFIT solar PV installed in Ontario. During the same period, Toronto Hydro has also enabled a total of 124 FIT connections (each greater than 10kW capacity) totalling over 21.1 MW of generation which accounts for an estimated 15% of rooftop FIT solar PV installed in Ontario.

In 2013, over 9.5 MW of solar photovoltaic (PV) power was connected to the Toronto Hydro grid. This consists of 155 microFIT projects at a total capacity of 1.06 MW and 43 FIT projects totalling 8.5 MW.

Development and Investment

Toronto Hydro continues to actively support renewable generation in key areas:

- Direct investment in Solar PV projects
- Joint development/investment in Solar PV projects with City of Toronto
- Dedicated connection team and streamlined process
- Investment in enabling infrastructure projects which address grid technical constraints
- Energy centre to monitor/forecast/dispatch generation resources across Toronto
- Education and outreach programs to stakeholders

Toronto Hydro's Generation Group has been working on solar projects since the FIT 1.0 program was announced by the OPA in 2009. Some examples include two FIT contracts that achieved commercial operation in 2011: 250kW solar project at 500 Commissioners St. and 250kW solar project at the Exhibition Place.

THESL formed a set of joint ventures with the City in 2010 to develop solar PV projects on City owned facilities. The first group of City Solar projects achieved Commercial Operation in early 2013. This group consisted of 9 projects on community centres across the city totalling 810kW of capacity. The last remaining City Solar project from this group of FIT 1.0 projects required structural reinforcement (Malvern). It is currently under construction with commercial operation expected in Q1 2014 adding another 210kW of capacity. The 9 City Solar projects that are currently in operation have achieved 980.5 MWh of production to date.

Over 50 City facilities have been reviewed for feasibility for solar PV systems. Facilities were reviewed for electrical interconnection, roof age, roof condition, roof obstructions, and structural capacity. The first group of sites were the ten best facilities for solar PV development at the time FIT 1.0 was released. Over time, City buildings are getting reroofed which can also alleviate the structural capacity constraints because of the modern practice of using lighter roof materials.

Apart from generation, THESL has also worked with a consortium of industry leaders to develop and integrate the first Community Energy Storage (CES) system in Toronto's urban setting. The project is funded in part by Sustainable Development Technology Canada (SDTC).

Toronto Hydro is faced with the challenge of modernizing an aging infrastructure that is capable of integrating the rising number of distributed renewable generation units and electric vehicles. The grid must continue to provide power reliably and meet the rising power quality demands from its customers. CES is a comprehensive solution that addresses these challenges.

ENERGY SECURITY AND SUPPLY

Through its Corporate Disaster Preparedness work and investment in new infrastructure, THESL supports the City's objective of ensuring the adequacy of capacity, infrastructure renewal, and mitigation of high risk events stemming from the unplanned loss of one or both of the City's transmission stations.

Emergency Preparedness

We developed, completed and approved 4 of 8 THESL's corporate standards in emergency management and revised our grid system plan for emergencies. To implement these documents, THESL conducted 9 separate training sessions for its staff identified as having a key role during an emergency.

Once individuals were familiar with their roles, we conducted 3 exercises and participated in another 3 exercises with our balancing authority (Independent Electricity System Operator) and shareholder (City of Toronto) for assurance purposes. One of our exercises, titled Exercise Vacancy (October 17, 2013) simulated a pandemic for exercise participants to work through. We identified two separate teams: an exercise design team and an observation team to simulate a pandemic scenario and make observations respectively, thereby exercising participants' familiarity with their plans, roles and responsibilities.

Other than the scheduled exercises, Toronto Hydro successfully dealt several real emergencies, in 2013, that occurred on July 8th (flash flood), July 19th (wind storm), October 31st and the most recent December 22nd (ice storm). For each of these emergencies, Toronto Hydro practiced the Corporate Disaster Preparedness protocols which helped our staff effectively act and respond.

Pre-planning and following a structured approach to managing emergencies resulted in faster and more efficient actions, better coordination with external shareholders (City of Toronto) and an increased confidence in managing under crisis conditions.

Investment in New Infrastructure

For the past several years THESL has invested a significant amount of resources to renew aging distribution infrastructure and modernize the grid. Specific programs include replacement of direct buried underground cables, overhead line rebuilds, voltage conversions, lead cable renewal and replacement of critical stations infrastructure like power transformers, switchgear and circuit breakers.

Construction continues on the new transformer station (TS) in the core of downtown Toronto, Copeland TS. The project involves the construction of an underground station building, a tunnel for the high voltage transmission connection, installation of electrical equipment and site landscaping work. When complete, Copeland TS is expected to provide an initial installed capacity of 144 MVA, with provisions for future expansion to a total 288 MVA. Copeland TS is proposed to provide a much needed capacity relief to the downtown core. Additionally, the station is proposed to facilitate infrastructure renewal at nearby Windsor TS and provide additional contingency support to the area.

CLIMATE CHANGE ADAPTATION

THESL supports the City's Climate Change Adaptation Strategy[6], through THESL's climate adaptation program.

The goals of this program are threefold: (1) to manage weather related risks to the THESL system and operations; (2) to enhance system resilience to adapt to climate change and withstand extreme weather events; and (3) improve restoration practices when extreme weather events affect the system

In 2013, THESL initiated multiple programs focused on identifying its assets' vulnerabilities and uncertainties related to climate change.

THESL will conduct the second phase of its Climate Change Risk Assessment of Electrical Distribution Infrastructure in 2014. The first phase of this assessment, done in 2012, identified equipment vulnerabilities in the system based on past weather. The second phase will focus of system level vulnerabilities based on future weather patterns. The program has been approved and funded by Natural Resources Canada (NRCan). The assessment will be executed with the assistance of the Clean Air Partnership, Engineers Canada and Architecture Engineering Construction Operations and Maintenance Technology (AECOM). The second phase of this program will build on information collected in the first phase of the program. Phase two of the program will analyze THESL's system and identify its vulnerabilities looking at future weather patterns and map risk scenarios. In preparation for the Phase Two of the program, in 2013, THESL conducted research on publicly available weather prediction papers and model results from sources such as Intergovernmental Panel on Climate Change (IPCC) and Senes Consulting Ltd .

THESL also participated in CEA's Roundtable on Climate Adaptation. In these workshops, Toronto Hydro along with other utilities identified key objectives for the electricity industry, such as establishing a common industry approach to impacts of climate change on assets.

Lastly, THESL collaborated with the City and provided input in the municipal infrastructure assessment initiatives which are part of City's resilience awareness and preparedness efforts.

[6] Climate Change Adaptation Strategy, Ahead of the Storm: Preparing Toronto for Climate Change (2008)