Delivering Fairness and Choice
LTEP 2017

Chapter 4. Strengthening our Commitment to Energy Conservation & Efficiency

Ontarians can be proud of what we have accomplished with conservation and energy efficiency. Between 2005 and 2015, we conserved 13.5 TWh of electricity[i]. That's equivalent to the electricity used by 1.5 million households in a year, or the amount of electricity that powered the cities of London, Kingston, Ottawa and Peterborough in 2015[ii].

Energy efficiency is becoming more of a part of our everyday lives. According to the IESO's 2015 study on the province's conservation efforts, businesses are becoming more productive by investing in energy-efficiency upgrades, and residents are choosing to install energy-efficient equipment in their homes, some with the help of Ontario's suite of residential and business conservation programs. (see below).

What Ontarians said in the LTEP Consultations and Engagements

- Put Conservation First
- Improve building codes and standards
- Increase awareness of conservation programs
- Expand conservation to other fuels
- Reduce line losses on distribution networks
- Balance costs with emission reductions

Ontario has been putting conservation and energy efficiency at the centre of its energy policy since LTEP 2013. Since then, the Ministry of Energy, its agencies, and electricity and natural gas distributors have been implementing Ontario's *Conservation First* policy.

Conservation and energy efficiency require a sustained commitment if they are to achieve persistent savings over the long-term. Ontario is enhancing its *Conservation First* commitment

to improve affordability and choice for people, businesses and communities, and to coordinate its conservation programs with Ontario's climate change objectives.

[CALL OUT BOX: The Savings from Conservation and Energy Efficiency]

Electricity

- The province has avoided $2 in added costs to the electricity system every time $1 has been invested in energy efficiency[iii].
- Conservation costs about $40 per megawatt hour (MWh), which is cheaper than most forms of new supply[iv].

Natural Gas.

- An investment of about $790 million in efficiency programs between 2000 and 2014 saved about $4.3 billion for natural gas ratepayers.
- In 2014, these programs cost about 2.5 cents per cubic metre of gas saved compared to an average residential natural gas price of 18.3 cents per cubic metre[v].

Getting More from Conservation

Ontario has a healthy supply of energy, and any added demand for electricity is not expected to materialize until the mid-2020s. In this context, Ontario will continue use conservation, energy efficiency programs and improved efficiency standards to drive towards the long-term target established in LTEP 2013 of 30 TWh of electricity savings by 2032. The Province and its agencies will continue to assess the achievable potential for energy conservation, and explore options to enhance the value of our conservation investments. These will take into account the reductions in energy use achieved through Ontario's *Climate Change Action Plan*.

The IESO and the OEB are currently conducting mid-term reviews of the *Conservation First Framework* for electricity conservation programs and the *Demand Side Management Framework* for natural gas programs. The reviews are looking at the distributors' 2020 targets for conservation savings, program budgets and how programs are meeting customer needs.

Demand Response

Demand response (DR) refers to the voluntary programs that reward electricity customers for reducing their electricity demand during periods of peak demand. DR can enhance the reliability of the system, as well as reduce system costs and GHG emissions. Examples of DR are a factory temporarily halting a process, or a group of residential consumers reducing their air conditioning when electricity demand is high.

The IESO has successfully transitioned away from using contracts to procure DR to holding competitive auctions. The two DR auctions held in 2015 and 2016 reduced the cost of providing DR by up to 27% compared to previous contracts[vi]. As part of the transition, the IESO is now using DR to better respond to system needs when electricity demand increases or decreases during the day.

LTEP 2013 set a long-term target to use DR to reduce 10% of the province's peak electricity demand by 2025. As Ontario transitions to a technology capacity auction, Ontario will not pursue a long-term DR target, instead working with the IESO to transform the DR auction into a technology-neutral capacity auction, where DR resources can compete directly with traditional generation.

The IESO is also assessing the impact the *Conservation First Framework* and Industrial Accelerator Program will have on electricity planning and Ontario's climate change objectives.

Ensuring a Customer-Centred Approach

The current conservation frameworks encourage electricity and natural gas distributors to collaborate to provide more efficient programs and a streamlined experience for customers. Such partnerships can provide energy consumers with a one-stop approach to meeting their energy management needs. Currently, 46 electricity distributors are involved in joint conservation plans, and electricity distributors are partnering with natural gas distributors to design and develop multi-fuel programs.

Distributors are being encouraged to develop new and innovative programs for their customers. The new programs currently include Hydro One's Heat Pump Advantage pilot, Enersource's Small Business Refrigeration for small businesses, the Toronto Hydro's customer discounts on Energy Star pool pumps, and the Enbridge Gas Distribution's School Energy Competition.

The IESO has supported innovation by launching the first full-scale "pay-for-performance" program in North America in 2016. The *Save on Energy Multi-Distributor Pay-for-Performance Program* rewards businesses for improving their overall energy performance over a number of years. Businesses are paid for each kilowatt hour they conserve, and are given flexibility on how they achieve those savings. Ratepayers benefit as well: participants only have to file a single project application, reducing the administration costs of the program.

[CASE STUDY: Loblaws Multi-Site P4P
Message: conservation is cost effective and builds capacity
Content: Details of pilot]
[CASE STUDY: Hydro One Heat Pump Advantage customer
Message: customer choice and helps reduce electricity bills
Content: what is the technology and how a participant benefitted from the program]

Commented [CD(1]: Add residential DR breakout box

Commented [AH(2]: MO requested that this say a "more competitive market".

Suggest keeping the word "capacity market", since this is a known term, also calling it "more competitive" implies the market was not very competitive to start with.

Also suggest keeping the word "transform" as opposed to "grow" since we are not growing the DR market, in fact we are eliminating the DR target.

Commented [CD(3]: Commit to holding auctions to continue to "grow this resource."

IESO's next pecinned DR auction will be in winter 2017

[CASE STUDY: Business Refrigeration Incentive - pub
Message: conservation helps manage energy use
Content: Measures and savings of a participating small business]
[CASE STUDY: DSM – Enbridge and University of Toronto
Message: conservation helps manage energy use
Content: details of a natural gas project]

Expanding Home Retrofits

As part of its *Climate Change Strategy,* Ontario has invested $100 million from its Green Investment Fund (GIF) to help eligible homeowners who primarily heat with natural gas, oil, propane or wood. They can improve the energy efficiency of their homes, reduce their energy bills and cut greenhouse gas emissions by participating in enhanced residential audit and retrofit programs offered by Enbridge Gas Distribution and Union Gas.

Launched province-wide on October 31, 2016, the program is expected to enable the auditing and retrofitting of about 37,000 additional homes by 2019, and cumulatively reduce their lifetime greenhouse gas emissions by approximately 1.6 million tonnes. [1]

Ontario further enhanced the home energy audit and retrofit programs in May 2017. Partnering with Enbridge Gas and Union Gas, the IESO expanded the program to electrically-heated homes. This 'Whole Home' approach is now providing residential consumers with a simple, one-stop to energy efficiency improvements.

[1] "Helping Homeowners Cut Energy Bills with Retrofits and Renovations." October 31, 2016, https://news.ontario.ca/opo/en/2016/10/helping-homeowners-cut-energy-bills-with-retrofits-and-renovations.html

Energy Efficiency for Your Whole Home Case Study

Incentives from the *Home Energy Conservation Program* allow families like the O'Hara's to reduce their energy bills, increase their home comfort, and cut greenhouse gas emissions. The O'Hara's upgraded their furnace, hot water heater and windows, improving the efficiency of their more than century-old home. They also added basement insulation, and air sealed their home. The upgrades will reduce the O'Hara's consumption of natural gas by 36 per cent, and cut their greenhouse gas emissions by 1.67 tonnes annually. In addition to retrofitting their Home, the O'Hara's installed a Smart Thermostat, which increases their savings by reducing home temperatures when they are away.

Smart Thermostats

Smart thermostats are the next important technology for homeowners looking to reduce the costs of heating and cooling their homes as well as their carbon footprint. Smart thermostats:

- give consumers more information about their energy use;
- enable customers to use a smart phone app to remotely control the temperature of the home or small business; and
- automatically adjust the temperature to respond to changes in a customer's schedule, or seasonal changes.

Ontario will work with the IESO to standardize discounts and rebates for their purchase and ensure the incentives to purchase smart thermostats are available to homeowners across the province.

[CALL OUT BOX: EcoSchools]

Ontario EcoSchools brings information about energy conservation to more of the province's students and teachers.

Ontario EcoSchools aims to give all members of the school's community the knowledge, skills, perspectives and desire they need to act as environmentally responsible citizens. The mission is to nurture environmental leaders, reduce the ecological impact of schools and build school communities that are environmentally responsible.

More than 800,000 students across the province are engaged in the program.[23]

With support from the province, the program is expected to grow over the next two years to include about 2,000 schools from 62 school boards, reaching approximately 1 million students from kindergarten to grade 12.

Providing Choice through Information, Tools & Data

Ontario's energy benchmarking and rating initiatives give people and organizations the tools and information they need to understand the energy performance of their homes and businesses, and compare it with similar buildings. They can use this information to manage their usage and costs, and justify investments in energy efficiency. As of July 2017, 16 electricity distributors have social benchmarking programs in their Conservation and Demand Management Plans, with four programs currently available to customers.

Ontario's *Climate Change Action Plan has* committed to expanding the province's Green Button Initiative.[vii] Green Button Download My Data gives households and businesses easy electronic access to data on their energy and water consumption. Green Button Connect My Data lets households and businesses securely and automatically transfer that own data to applications of their choice. Greater access to data through Green Button will encourage consumers to change their behaviour and improve the energy efficiency of their home. It will also support energy reporting and benchmarking, and create new opportunities for economic development. [viii]

Ontario has taken steps to support the broader adoption of Green Button. Between 2013 and 2015, London Hydro and Hydro One successfully completed pilots of Green Button Connect My Data, and in 2016 the Ministry of Energy completed a cost-benefit analysis and consulted with a broad range of partners on a proposal to implement Green Button in all of the province's electricity, natural gas and water utilities.

Ontario is committed to expanding Green Button province-wide and intends to bring forward amending legislation that would require electricity and natural gas distributors to implement Green Button Download My Data and Connect My Data. In addition, the Province will take a

[2] Source: Ontario EcoSchools Annual Report to the Ministry of the Energy 2015-16

collaborative approach to adapting the Green Button standard for use with natural gas and water and updating guidance documents for Green Button's use with electricity.

[CASE STUDY: Green Button
Message: Ontario's leadership and innovation
Content: Budweiser Gardens accurately forecasts energy usage using event assist. Event Assist will help Budweiser Gardens to better understand their usage so they can cost-effectively analyse energy costs on an event by event basis]

Green Button
Message: Ontario's leadership and innovation
Content: Thames Valley District School Board uses Green Button to compare energy profiles of 165 schools, increasing efficiency and minimizing unnecessary costs

Organizations in Ontario's Broader Public Sector must annually report their energy consumption and greenhouse gas emissions. Building on this success, as well as the lessons learned from similar programs in the United States, Ontario has introduced a requirement for Energy and Water Reporting and Benchmarking for large private sector buildings[4].

Starting in July 2018, and phased in over three years, owners of large commercial, multi-unit residential and some industrial buildings must annually submit information on their building's use of energy and water and its GHG emissions. Some of the data will be annually posted on Ontario's Open Data website so owners can compare the energy and water usage of their buildings with that of similar facilities, and identify where improvements can be made.

Ontario is also exploring how to increase corporate financing for energy efficiency projects. The Investor Confidence Project gives financiers the information and tools they need to assess the viability of energy efficiency projects. The Project was established by the Environmental Defense Fund in the United States in 2013. Ontario, in partnership with the MaRS Advanced Energy Centre, is piloting Investor Confidence Project protocols in Ontario and exploring how they can be adapted for the Canadian market

Raising the Bar for Energy and Water Efficiency

Ontario continues to play a leading role in improving the energy efficiency of equipment in our homes, offices and factories. Since 2013, the Province improved or set new energy efficiency standards for over 60 products. The gains in energy efficiency have not only endured, but economies of scale have lowered the cost of the technologies, making them more popular, affordable and more widely available.

[4] O.reg. 20.17

With the amendment of the *Green Energy Act, 2009*, the Province is now regulating the water efficiency of products that consume both energy and water. As a result, it is now on a path to achieve more efficient use of water and even greater energy savings and reductions in greenhouse gas emissions.

How Enhanced Standards Can Save Water and Energy for Households

- Water efficiency standards for clothes washers are estimated to save **22 billion liters/year** of water in 2032, equivalent to:
  - 9000 Olympic-sized swimming pools
  - Amount of water that flows over Niagara falls in 2.75 hours
- New energy efficiency standards for clothes washers from 2015 are estimated to save 0.60 TWh/yr of electricity in 2032, equivalent to taking around 67,000 homes off the grid, or
  - The annual electricity consumed by all the private dwellings (residential homes) in the City of Kingston
  - The annual electricity consumed by the City of Stratford



In addition, advanced standards for space and water heating equipment could significantly reduce the energy use and greenhouse gas emissions of new and existing homes and buildings, leading them to become net zero carbon emitters.

Ontario will continue to set advanced efficiency standards for products and appliances and work with other provinces and the federal government in order to harmonize and raise the bar for energy and water efficiency standards.

Efficiency Standards for Drinking Water and Waste- Water Treatment Plants

Ontario is exploring ways to set or update energy efficiency standards for key electrical equipment in drinking water and waste water treatment plants. As Ontario's *Climate Change Action Plan* pointed out, this initiative would help reduce one of the largest uses of electricity by municipalities and help them save on their electricity bills.

Commented [JM4]: Are these new water efficiency standards?

Commented [CD(5]: Federal action and coordination needed. CES/EMMC call to action

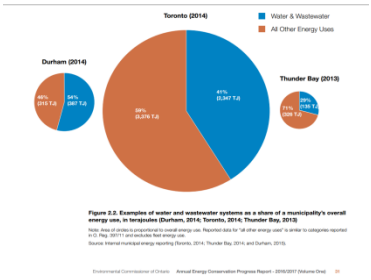

Figure 2.2: Examples of water and wastewater systems as a share of a municipality's overall energy use, in terajoules (Durham, 2014; Toronto, 2014; Thunder Bay, 2013)

Note: Area of circles is proportional to overall energy use. Reported data for "all other energy uses" is similar to categories reported in O. Reg. 397/11 and excludes fleet energy use.

Source: Internal municipal energy reporting (Toronto, 2014; Thunder Bay, 2014; and Durham, 2015).

> *"Municipal water and waste-water services are typically one third to one-half of a municipality's total electrical use, so there is potential for reductions in both costs and emissions."*
> CCAP 2016, pg. 83

Expanding the Scope of Conservation

Ontario is expanding the scope of conservation to ensure that all participants in the energy sector put *Conservation First* and help Ontario reach its greenhouse gas reduction targets.

Natural gas and electricity conservation should not be limited to the actions customers take in their homes or businesses; we need to make smart choices at all levels. The Province is looking at using renewable natural gas (RNG) to lower the carbon intensity of our natural gas system. For electricity, it has been looking as further embedding *Conservation First* in the planning and management of the entire electricity system. Innovative technologies can cost-effectively reduce line losses and optimize voltage levels on distribution networks, lowering both the demand for electricity and the peak demand.

Several pilots across North America, including pilots in Ontario funded by the Smart Grid and Conservation Funds, have demonstrated the potential benefits of deploying energy efficient technologies on distribution networks. A recent study commissioned by the Ministry of Energy estimated that energy efficiency technologies can be cost-effectively deployed on 30 per cent of Ontario's electricity distribution networks[ix].

The Province and its agencies will encourage distributors to increase the energy efficiency of their networks, by allowing them to count the electricity savings from these technologies towards their electricity savings targets under the *Conservation First Framework*. The OEB will also explore ways to further encourage distributors to pursue energy efficiency on their distribution networks.

Commented [CD(6]: Call it what it is – "in-front of meter conservation"

[CASE STUDY/VISUALS - a graph with the 30 TWh target and the progress to date.

[CASE STUDY: Toronto Cecil Transformer Station
Message: Conservation first before infrastructure investments
Content: Description of project's benefits and innovation and quote from Toronto Hydro CEO]

CASE STUDY: Enbridge Gas – KI industry
Message: Conservation helping industrial consumers
Content: Description of savings

Integrating Conservation and Climate Change Programs

Ontario's *Climate Change Action Plan* emphasized the need to increase the use of low-carbon technology, such as solar panels, and heat pumps, in Ontario homes and businesses. Several programs to increase energy choices for Ontarians are being introduced this year, funded by the proceeds from the cap and trade program.

A new agency, the Green Ontario Fund, will help Ontarians move to a low-carbon future by offering them incentives, financing and services to increase the use of low-carbon technologies that reduce greenhouse gas emissions. The Green Ontario Fund website provides a "one-window" approach for Ontarians seeking help, information and access to its programs, as well as to other conservation and renewable energy programs in Ontario.

Key programs of the Green Ontario Fund will be delivered by IESO. This builds on the success of the province's existing energy efficiency programs and will ensure Ontarian's get a coordinated and customer-focused approach that gives them more opportunities to reduce their energy costs and carbon footprint.

Ontario will work with its agencies to consider further opportunities to integrate the delivery of all conservation and low-carbon technology programs, for both electricity and fuels.

Under current conservation programs, combined heat and power projects primarily fueled by fossil fuels, such as natural gas, have been eligible for incentives, because they can significantly reduce demand on the electricity grid.

To help meet Ontario's climate change goals, the province will not allow these types of projects to enroll in the conservation programs after July 1, 2018. The deadline coincides with the end of the mid-term review of the *Conservation First Framework* and the *Industrial Accelerator Program*. Customers currently developing such projects can apply until July 1, 2018.

Because of their environmental benefit, the installation of renewable energy projects, such as solar thermal water heating or use of biomass fuel for boilers, will continue to be eligible for funding under the *Conservation First Framework* and *Industrial Accelerator Program*. Electricity distributors may also offer incentives for energy storage systems that are integrated with a customer's own renewable energy project. When added to self-generation, energy storage systems provide reliability and can help customers reduce their grid demand when prices are highest. This can help reduce local and provincial system peaks.

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[i] IESO, Ontario Planning Outlook, Module 3
[ii] Electricity for Cities of Kingston and Stratford - 2015 OEB Yearbook of Electricity Distributors: http://cf.oeb.ca/oeb/_Documents/RRR/2015_Yearbook_of_Electricity_Distributors.pdf

[iii] IESO, 2015 Conservation Results Report
[iv] IESO 2015 Conservation Results Report
[v] ECO, Annual Energy Conservation progress Report- 2015/2016
[vi] February 6, 2017 DR Update Note from IESO – Verified by email on June 23, 2017
[vii] Ontario's Five-Year Climate Change Action Plan 2016-2020, pages 29 and 69
[viii] Dunksy's Cost-Benefit Analysis Report
[ix] 2017 Navigant Report – Considerations for Deploying IFMC Technologies in Ontario