London Hydro
111 Horton Street
P.O. Box 2700
London, ON
N6A 4H6

September 30, 2014

Ms. Kirstin Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Re: OEB File No. EB-2010-0215
London Hydro Inc.
Conservation and Demand Management - 2013 Annual Report

Please find London Hydro Inc.'s 2013 Conservation and Demand Management ("CDM") Report. This CDM Report has been prepared in accordance with Section 2.2 of the *Conservation and Demand Management Code for Electricity Distributors.*

Should there be-any questions, please do not hesitate to contact me.

Yours Truly,

Martin Benum
Director of Regulatory Affairs
London Hydro
Tele: 519-661-5800 ext. 5750
Cell: 226-926-0959
email: benumm@londonhydro.com

London Hydro Report EM-14-02, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2013 Activities & Achievements*

September 2014

EXECUTIVE SUMMARY

The provincial *Green Energy and Green Economy Act, 2009* created the legislative framework for the Minister of Energy & Infrastructure to issue a series of directives. On March 31st, 2010, the Minister of Energy & Infrastructure issued a directive to the Ontario Energy Board to:

- establish CDM targets for each licensed distributor,
- make such targets a condition of a distributor's license, and
- develop a CDM Code that includes rules relating to the planning, design, approval, implementation evaluation, measurement and verification, reporting requirements and performance incentives associated with CDM programs and to such other matters as the Board considers appropriate.

Ontario Energy Board Decision and Order EB-2010-0215 / EB-2010-0216, *CDM Targets for Licensed Electricity Distributors*, dated November 12, 2010, defined the energy conservation and demand management (CDM) targets for all LDC's. London Hydro's CDM targets are as follows:

- 2014 Net Peak Demand Savings.....41.440 MW
- 2011 – 2014 Net Cumulative Energy Savings:.....156.640 GWh

The Ontario Power Authority (OPA) is a provincial agency established by Bill 100, *The Electricity Restructuring Act, 2004* which set out several objectives for the organization, including (but not limited to):

- To engage in activities that facilitates load management.
- To engage in activities that promotes electricity conservation and the efficient use of electricity.

In carrying out the "*conservation*" component of its mandate, the OPA is responsible for the design of a portfolio of provincial energy conservation and demand management programs that are referred to in the industry as Tier 1 CDM programs. Toward this goal, the OPA has developed a number of provincial CDM initiatives geared to the following customer classifications:

- Residential Customers
- Commercial and Institutional (C&I) Customers
- Low-Income Customers
- Industrial Customers

The portfolio of provincial CDM programs targeted to residential customers fall under the umbrella saveONenergy™ FOR HOME brand illustrated below.

The saveONenergy FOR HOME portfolio includes the following elements:

- saveONenergy FRIDGE & FREEZER PICKUP program;
- saveONenergy HEATING & COOLING INCENTIVE program;
- saveONenergy *peaksaver* PLUS™ program;
- saveONenergy COUPON EVENT program; and
- saveONenergy EXCHANGE EVENT program.

The portfolio of provincial CDM programs targeted to commercial, industrial and institutional customers fall under the umbrella saveONenergy FOR BUSINESS brand illustrated below.

The saveONenergy FOR BUSINESS portfolio includes the following elements:

- saveONenergy DEMAND RESPONSE program;
- saveONenergy SMALL BUSINESS LIGHTING program;
- saveONenergy RETROFIT PROGRAM;
- saveONenergy AUDIT FUNDING program;
- saveONenergy EXISTING BUILDING COMMISSIONING program;
- saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION program;
- saveONenergy PROCESS & SYSTEMS program; and
- saveONenergy NEW HOME CONSTRUCTION program.

The provincial CDM program that is targeted to social and assisted housing is branded saveONenergy HOME ASSISTANCE.

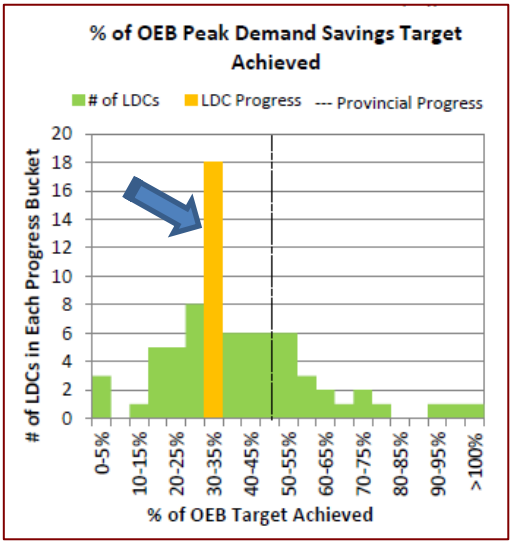
London Hydro's 2012 achievements on the energy conservation and demand management front can be looked at from two perspectives, namely (i) how did London Hydro fare in comparison to its CDM targets, and (ii) how did London Hydro fare in comparison to the community of other LDC's in the province?

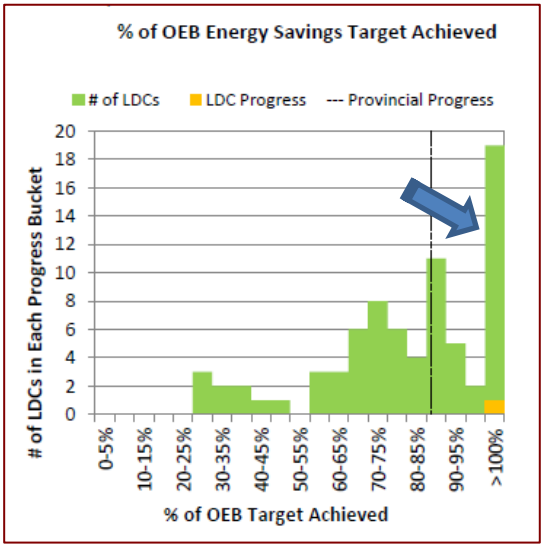
For 2013, London Hydro received credit for the following CDM achievements:

- 12.6 MW of peak demand reduction – this represents 31.1% of London Hydro's net peak demand reduction target (but could be as low as 24.6% if all participants in the saveONenergy DEMAND RESPONSE program opted out prior to December 2014); and

- 157.4 GWh of net accumulated energy savings – this represents 100.5% of London Hydro's four-year accumulated net energy savings target.

The two (2) charts below compare London Hydro's 2013 CDM performance against the 2013 achievements of the other LDC's in the province.





It will be seen that the 2013 achievement with respect to peak demand reduction is less than the provincial average progress, and is largely reflective of the difficulty that LDC's in discount zones face in enticing customers to participate in demand response programs, i.e. the incentive isn't sufficient to attract the interest of customers. With respect to energy savings, London Hydro has achieved its four-year target by the end of the third year.

It is also noteworthy that almost $2½ million in incentive payments was distributed throughout 2013. If one makes the general assumption that incentives represent 35% to 40% of the overall project cost, then London Hydro's CDM activities spurred some $6¼ to $7 million in local economic activity.

In its 2011 and 2012 submissions, London Hydro identified a number of early warning signs of more intractable issues (e.g. flaws with the underlying delivery model, needless program participation barriers, etc.) that were anticipated to become more significant in 2012 and beyond. These predictions came to be and as an unfortunate consequence, LDC's that wished to succeed with their CDM endeavors could not achieve their full potential.

In reporting these matters herein, London Hydro has adopted a "*warts and all*" reporting style. London Hydro is firmly committed to the success of CDM within its franchise service territory and it does not serve the industry well to "*sugar coat*" challenges that are ultimately barriers to London Hydro's customers actively participating in CDM programs.

Finally, it will be seen that London Hydro is fully committed to working with the LDC community (via active participation on various joint Electricity Distributors Association /

Ontario Power Authority working groups), the supply chain partners, and its customers to truly create the desired outcome of *a culture of conservation* in this province.

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TABLE OF CONTENTS

APPENDICES:

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 Background

The provincial *Green Energy and Green Economy Act, 2009* created the legislative framework for the Minister of Energy & Infrastructure to issue a series of directives. On March 31st, 2010, the Minister of Energy & Infrastructure issued a directive to the Ontario Energy Board to:

- establish CDM targets for each licensed distributor,
- make such targets a condition of a distributor's license, and
- develop a CDM Code that includes rules relating to the planning, design, approval, implementation evaluation, measurement and verification, reporting requirements and performance incentives associated with CDM programs and to such other matters as the Board considers appropriate.

Ontario Energy Board Decision and Order EB-2010-0215 / EB-2010-0216, *CDM Targets for Licensed Electricity Distributors*, dated November 12, 2010, defined the CDM targets for all LDC's. London Hydro's CDM targets are as follows:

- 2014 Net Peak Demand Savings.....41.440 MW
- 2011 – 2014 Net Cumulative Energy Savings:.....156.640 GWh

There are three types of CDM programs that LDC's can consider for meeting or exceeding their targets, namely:

- Tier 1 CDM programs – are turn-key province-wide programs, developed by the Ontario Power Authority (OPA), which are to be the foundation of each LDC's CDM strategy.
- Tier 2 CDM programs – are developed by groups of local distribution companies, also called multi-LDC programs.
- Tier 3 CDM programs – are unique programs designed by individual LDCs.

Note: The latter two classification of CDM program require specific approval by the Ontario Energy Board and are therefore often referred to as "Board-Approved CDM Programs".

LDC CDM portfolios can have a mix of the different types of conservation programs.

Section 2.1, *CDM Strategy Requirements*, of the OEB publication "*Conservation and Demand Management Code for Electricity Distributors*" [Ref 1], includes a regulatory requirement that licensed distributors file their respective CDM strategy with the Board by November 1, 2010.

London Hydro's CDM strategy document is entitled: *London Hydro's Energy Conservation and Demand-Side Management (CDM) Strategy, 2011 through to 2014*; dated October 29, 2010. [Ref 3]

1.2 Purpose

Section 2.2, *Annual Reports*, of the OEB publication entitled "*Conservation and Demand Management Code for Electricity Distributors*" [Ref 1], mandates that "*A distributor shall file an Annual Report with the Board by September 30 of each year. The Annual Report shall cover the period from January 1 to December 31 of the previous year.*" The CDM Code also stipulates the required format and content for such annual reports.

1.3 Scope

This document is London Hydro's second Annual CDM Report and covers the period from January 1, 2012 to December 31, 2012.

1.4 Program Naming Conventions

For the provincial Tier 1 CDM programs, there are differences in the program names used by the Ontario Power Authority in legal agreements with LDC's and program names used in the marketplace. For example, whereas the program name "Direct Install Lighting" is used in legal agreements between the OPA and the community of LDC's, the program is promoted in the marketplace under the name "saveONenergy SMALL BUSINESS LIGHTING". Similarly the "appliance retirement initiative" is known in the marketplace by the name "saveONenergy FRIDGE & FREEZER PICKUP".

Given that the intended audience for this report is primarily the Ontario Energy Board, London Hydro's customers, London Hydro's Board of Directors and Executive Management team, and the Mayor's Sustainable Energy Council, London Hydro has elected to identify programs herein by their respective marketplace names.

Note: A cross-reference between the customer-facing CDM program names and the program identifiers used on the various OPA-generated program schedules within the Master CDM Program Agreement is included as Appendix C in this Report.

1.5 References

[1] Ontario Energy Board publication: *Conservation and Demand Management Code for Electricity Distributors*; September 16, 2010.

[2] Ontario Energy Board Decision and Order EB-2010-0215 / EB-2010-0216, *CDM targets for licensed electricity distributors*; November 12, 2010.

[3] London Hydro report entitled: *London Hydro's Energy Conservation and Demand-Side Management (CDM) Strategy, 2011 through to 2014*; October 29, 2010.

[4] Addendum #1 to London Hydro Report EM-10-05, *Strategic Outlook for Energy Conservation and Demand-Side Management (CDM) Programs, 2011 through to 2014*; June 13, 2011.

[5] Ontario Energy Board publication EB-2012-003, *Guidelines for Electricity Distributor Conservation and Demand Management*; April 26, 2012.

1.6 Terminology

The definitions given below are not intended to embrace all legitimate meanings of the terms. They are applicable only to the subject matter treated in this Report.

Adjusted Gross Savings means the Gross Savings that are adjusted to include what can be physically counted and reliably measured, such as installation/in-service rates, breakage of equipment, data errors, hours of use, measure persistence rates, etc. Adjusted Gross Savings can also be calculated by applying a Realization Rate to Gross Savings estimates (see Realization Rate definition below).

Behavior-Based Programs are energy efficiency programs that utilize an understanding of how individuals interact with energy in order to decrease energy demand.

Demand Response is the reduction of customer energy usage at times of peak usage in order to help address system reliability, reflect market conditions and pricing, and support infrastructure optimization or deferral.

Effective Useful Life is the median number of years that an energy-efficiency measure is likely to remain in-place and operable, i.e. the number of years that a program's annual savings will last.

Energy Savings is the reduction in electricity use (kWh) or in fossil fuel use in thermal unit(s).

ENERGY STAR qualified refers to a program that was first developed in 1992 by the US Environmental Protection Agency (EPA) as a method to identify and promote products that are energy efficient. For example, appliances carrying the ENERGY STAR® label typically are 10 to 20% more energy efficient than non-rated models. Since its initial onset, the government has partnered with other industry members, to promote and expand the scope of this project to include, not only major appliances, but also new homes and buildings.

Ex-ante Estimate is a phrase used in conjunction with demand response programs meaning an engineering estimate "*before the event*" of the amount of load that will be curtailed. The opposite of ex-ante is ***ex-post*** (actual).

Free Rider is a CDM program evaluation term that describes energy efficiency program participants who would have taken the recommended actions on their own, even if the CDM program did not exist. Free riders can be 1) total, in which the participant's activity would have completely replicated the program measure; 2) partial, in which the participant's activity would have partially replicated the program measure; or 3) deferred, in which the participant's activity would have completely

replicated the program measure, but at a future time rather than the program's timeframe.

Free Ridership Rate is the percent of savings attributable to free riders.

Gross Savings is the change in energy consumption and/or demand that results directly from program-related actions taken by participants in an efficiency program, regardless of why they participated.

Interactive Effects is the impact of an energy efficient measure on the operation of other electrical or gas-fired equipment at the facility in which the measure is installed. For example, the installation of energy-efficient lighting systems in a retail store may measurably decrease the air conditioning load in the summer and the use of natural gas for space heating in the winter.

Measure Persistence Factor is the duration of an energy consuming measure, taking into account business turnover, early retirement of installed equipment, and other reasons measures might be removed or discontinued.

Net-to-gross ratio is a factor is applied to gross CDM program savings to determine a particular CDM program's net impact. The net-to-gross ratio equals the net program load impact divided by the gross program load impact.

Net Savings is the total change in energy consumption or demand that is attributable to an energy efficiency program. This change in energy consumption and/or demand may include, implicitly or explicitly, the effects of free drivers, free riders, energy efficiency standards, changes in the level of energy service, and other causes of changes in energy consumption or demand.

Realization Rate is a comparison of observed or measured (or evaluated) information to original estimated savings. Evaluations may include multiple realization rates (e.g., energy realization rate, demand realization rate, etc…). A Realization Rate is typically used to adjust Gross Savings to Adjusted Gross Savings, and reflects adjustments such as: data errors, persistent factors, in-service rate, interactive effects, etc.

Retrofit Measure refers to the replacement of currently functioning equipment with a more energy-efficient technology before its end of economic life. In buildings, retrofits may involve either structural enhancements to increase strength, or replacing major equipment central to the building's functions, such as HVAC or water heating systems. In industrial applications, retrofits involve the replacement of functioning equipment with new equipment

Rebound Effect is a modern term for the Jevons Paradox, a theory developed in the 1860's in Britain by William Stanley Jevons, which says that as machines become more efficient and use less energy, society responds by growing and using even more energy. With reference to energy conservation, the rebound effect can occur when a consumer adopts an energy-efficient technology, such as compact fluorescent lamps or an ENERGY STAR qualified central air conditioner, but then elects to operate the CFLs for longer time periods or to reduce the thermostat setting on the air

conditioning system, both being behavioral changes that diminish the benefits of using those more energy-efficiency technologies.

Savings Persistence Factor is a factor that reflects changes in program impacts over time (e.g. retention and degradation of measures).

Spillover, also called "***free drivers***", is a CDM programs evaluation term that describes energy efficiency program participants who take the recommended actions, but never claim the incentives. There are two categories of spillover as identified following:

- ***Non-Participant Spillover***: Non-participant spillover refers to energy efficient measures installed by program non-participants due to the program's influence. The non-participant spillover rate is savings from spillover measures expressed as a percentage of savings installed by non-participants through an energy efficiency program.
- ***Participant Spillover***: The situation where a customer installed equipment through the program and then installed additional equipment of the same type due to program influences, but without any financial or technical assistance from the program. The participant spillover rate is savings from spillover measures expressed as a percentage of savings installed by participants through an energy efficiency program.

Third Party Review is a review of program savings by an independent third party.

1.7 Acronyms, Abbreviations and Symbols

1.7.1 Acronyms

Acronyms used within this report are presented following in alphabetic order:

CDM	=	Conservation and Demand Management
CFL	=	Compact Fluorescent Lamp
CSA	=	Canadian Standards Association
DR	=	Demand Response
EDA	=	Electricity Distributors Association
EM&V	=	Evaluation, Monitoring and Verification
EUL	=	Effective Useful Life
IPSP	=	Integrated Power System Plan
LDC	=	Local Distribution Company
LED	=	Light-Emitting Diode
LICO	=	Low-Income Cut-Off
NTG	=	Net-to-Gross
OEB	=	Ontario Energy Board
OPA	=	Ontario Power Authority
RPP	=	Regulated Price Plan

TOU = Time of Use

1.7.2 Abbreviations

Abbreviations used in this report are presented following in alphabetic order:

GWh = gigawatt-hour
kW = kilowatt
kWh = kilowatt-hour
MW = megawatt
MWh = megawatt-hour

These abbreviations are consistent with CSA Standard Z85-1983, *Abbreviations for Scientific and Engineering Terms*.

2 BOARD-APPROVED CDM PROGRAMS

2.1 Time-of-Use Electricity Pricing

2.1.1 Background

Key excerpts from Section 3, *CDM Targets*, of the Ontario Energy Board publication EB-2012-003, *Guidelines for Electricity Distributor Conservation and Demand Management* [Ref 5] have been replicated below as a convenience of reference:

> *The Board recognizes the manner in which the CDM targets were developed and that a portion of the aggregate electricity demand target was intended to be attributable to savings achieved through the implementation of Time-of-Use ("TOU") prices.*
>
> **:**
>
> *… The Board has deemed the implementation of TOU pricing to be a Board-Approved CDM program for the purposes of achieving the CDM targets. …*
>
> **:**
>
> *In accordance with the Directive, for savings to be eligible to be counted towards the CDM targets, distributors must rely on the verified savings that are the result of using the OPA's Evaluation, Measurement and Verification ("EM&V") Protocols. The Board is of the view that any evaluations of savings from TOU pricing should be conducted by the OPA for the province, and then allocated to distributors. An approach that permitted distributors to conduct their own evaluations could result in aggregate savings in excess of the savings assessed for the province as a whole.*

As of September 2014, the Ontario Power Authority (OPA) has not released its preliminary results of TOU savings to distributors. Therefore London Hydro is not able to provide any verified savings related to London Hydro's TOU program at this time. London Hydro will report these results upon receipt from the OPA.

2.1.2 TOU Program Description

The provincial time-of-use electricity pricing initiative is a behavioral CDM program that is targeted to residential and small business customers (i.e. customers in the "*residential*" and "*general service < 50 kW*" tariff classifications). The TOU initiative is designed to encourage the shifting of energy usage. Therefore peak demand reductions are expected, and energy conservation benefits may also be realized.

The TOU pricing program is offered year round.

Figure 2-1, Sensus iCon-A Smart-Meter

Figure 2-2 below illustrates the seasonally adjusted time periods for on-peak, mid-peak and off-peak electricity pricing.

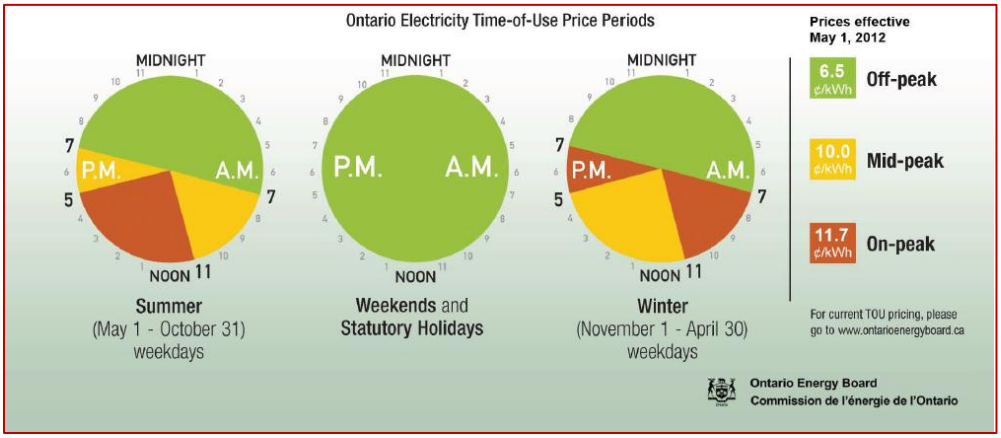


Figure 2-2, Regulated Time-of-Use Price Periods

It should be noted that, in the summer, the on-peak period extends from 11:00 am to 5:00 pm. In the winter, however, there are two distinct on-peak periods; the first extending from 7:00 am to 11:00 am, and the second extending from 5:00 pm to 7:00 pm. All weekends and statutory holidays have off-peak electricity pricing throughout the day.

The regulated time-of-use electricity price is adjusted twice annually by the Ontario Energy Board. A chronology of the Regulated Price Plan – Time-of-Use (RPP-TOU) electricity price schedules is provided below:

Table 2-1, Regulated Price Plan - Time-of-Use Electricity Prices

Effective Date	Electricity Rate (¢/ kWh)		
	On-Peak	Mid-Peak	Off-Peak
(Col 1)	(Col 2)	(Col 3)	(Col 4)
November 1, 2010	9.9	8.1	5.1
May 1, 2011	10.7	8.9	5.9
November 1, 2011	10.8	9.2	6.2
May 1, 2012	11.7	10.0	6.5
November 1, 2012	11.8	9.9	6.3
May 1, 2013	12.4	10.4	6.7
November 1, 2013	12.9	10.9	7.2
May 1, 2014	13.5	11.2	7.5

Customers with Smart-meters are able to view their hourly electricity consumption profiles via the Internet. Figure 2-3 below shows one view of the web presentment feature available to London Hydro's customers.

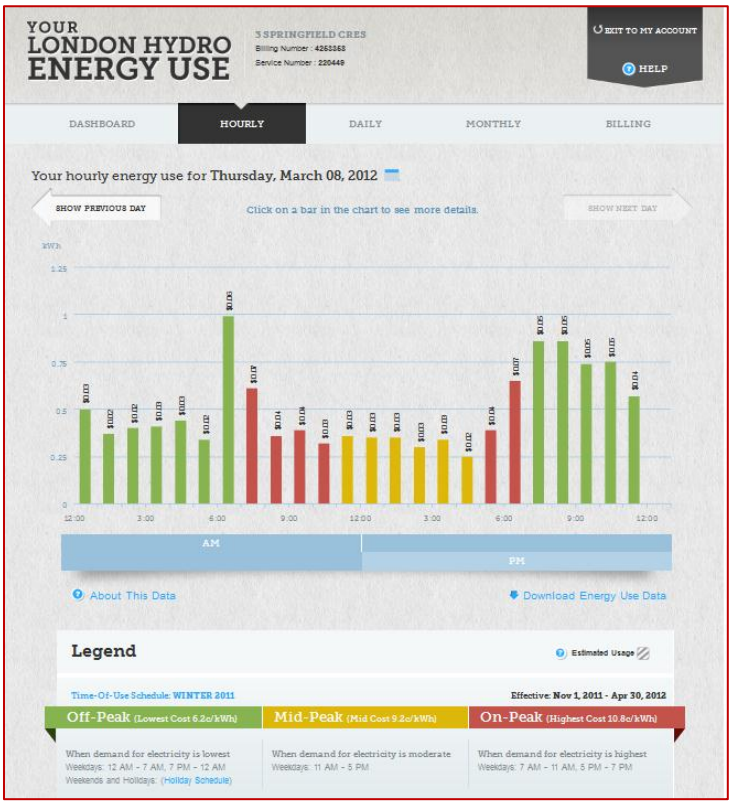


Figure 2-3, Web Presentment of Hourly Consumption Data

Beginning in December 2011, London Hydro commenced the transition process by moving 20 pilot group customers to TOU billing. Based on the positive feedback and no transition issues, customers were given the 30 days' notice in January. Migration of customers based on their billing period started in February and was substantially complete by mid-March 2012 as indicated in Table 2-2[1] below.

Table 2-2, Actual Customer Transition to TOU Electricity Rates

Weekend	Customer Accounts Cut-Over to TOU Rates	Cumulative Customers on TOU Electricity Rates
November 1, 2011	20	20
February 25, 2012	18,530	18,550
March 3, 2012	52,595	71,145
March 10, 2012	32,206	103,351
March 17, 2012	35,147	138,498
Poly-phase meters	6,597	145,095
New installs	55	**145,150**

[1] London Hydro Inc. filing ED-2002-0557, *Narrative for Smart Meter Cost Recovery Application* (Board File Number EB-2011-0181), Section 8.1, *Conversion of Customers to TOU Electricity Rates*; pg 55.

There were a small number of customers that were not transitioned to time-of-use electricity pricing for several months past mid-March for a variety of reasons, including customer refusals to have a Smart-meter installed, premise access issues, etc.

2.1.3 Preliminary Observations Concerning Energy Consumption Patterns

As previously noted in Section 2.1.1 herein, the OPA is responsible for quantifying the energy savings resulting from time-of-use electricity pricing. Nonetheless, certain preliminary observation can be made with respect to energy consumption trends amongst the population of residential customers.

2.1.3.1 Household Energy Consumption

The red line in Figure 2-4 shows the average monthly billed energy consumption (in kWh) per residential customer over the timeframe from 2006 to 2013. It will be seen that in 2006 the average monthly billed energy consumption was 717 kWh and in 2013 the average monthly billed energy consumption declined to 663 kWh.

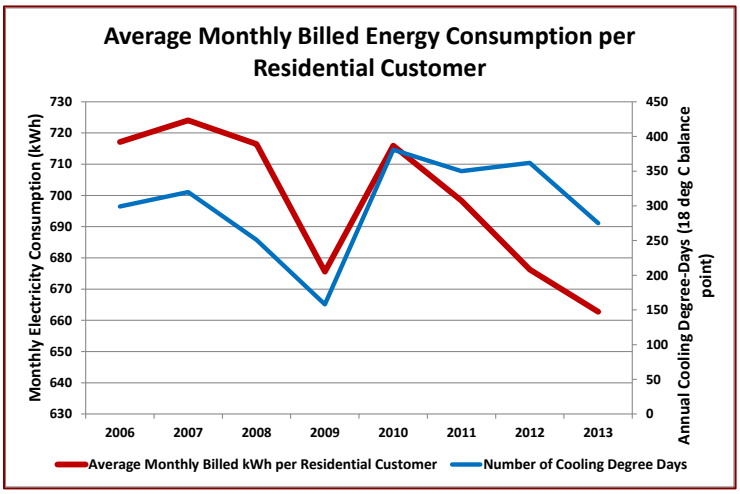


Figure 2-4, Trends in Residential Energy Consumption

As with most LDC's in southwestern Ontario, air conditioning has a significant impact on summer energy sales. The blue line in Figure 2-4 shows the number of cooling degree-days (using an 18°C balance point) for each of the years. It will be observed that 2009 was characterized by an unseasonably cool summer and hence energy sales were significantly lower than in other years.

It is interesting to note that 2010, 2011 and 2012 can be characterized as having hot summers with 350 or greater cooling degree-days, and yet the average monthly billed energy consumption throughout this period steadily decreased from 716 kWh per month in 2010 to 698 kWh per month in 2011 to 676 kWh per month in 2012.

Clearly energy-efficiency is occurring amongst the residential sector, but this downward trend clearly preceded the introduction of Smart meters and time-of-use

electricity pricing. Some of this observed decrease is attributable to residential energy conservation programs (such as the saveONenergy HEATING & COOLING INCENTIVE program), but it is likely that a greater share was the result of natural events, e.g. the adoption of CFL's had reached the tipping point in the marketplace, customers were replacing their traditional cathode-ray tube television sets with large flat-panel liquid crystal display televisions due to plummeting prices, customers were replacing their first generation home computer systems (with CRT screens and power-hungry printers) with modern home computer systems (with flat screen monitors and more energy-efficient printers), various household appliances (e.g. refrigerators, dishwashers, etc.) that had reached end-of-life were being replaced with household appliances that are inherently more energy-efficient (due to more stringent energy performance standards for consumer appliances), etc.

2.1.3.2 The Shifting of Electricity Usage

The purpose of installing Smart-meters is given in the landmark ECSTF report *Tough Choices: Addressing Ontario's Power Needs*, and the appropriate passage is replicated below for convenience of reference:[2]

> 4. *Consumers should be encouraged to shift consumption from periods of high demand and high prices. In order to achieve this, they will need both the incentives in terms of differentiated prices and the technology in the form of smart meters.*

In the 2½ years that London Hydro has offered time-of-use electricity pricing to its residential customers, the consumption pattern is illustrated in Figure 2-4 below.

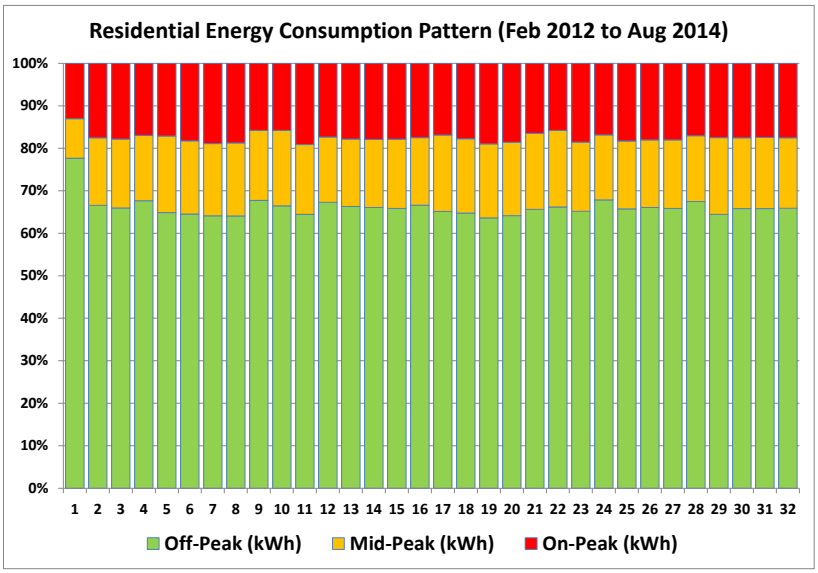


Figure 2-5, Residential Energy Consumption Pattern

[2] Electricity Conservation & Supply Task Force report: *Tough Choices: Addressing Ontario's Power Needs*; Final Report to the Minister; January 2004; page 45

It can be observed from Figure 2-5 that, for the residential sector, the proportion of on-peak consumption (as depicted by the "*red*" segment on the stacked bar graph) has remained relatively constant at about 17.7%.

Clearly no discernible load shifting by residential customers is occurring. As such, it would seem that there is a missed opportunity here. Customers don't need to know the theory of Smart-meters or the intricate details of the electricity marketplace. Rather there needs to be an action-oriented information campaign that tells customers exactly what simple things that they can do to shift their energy consumption from on-peak periods to mid- and off-peak periods.

In the 2½ years that London Hydro has offered time-of-use electricity pricing to its small business customers, the consumption pattern is illustrated in Figure 2-6 below.

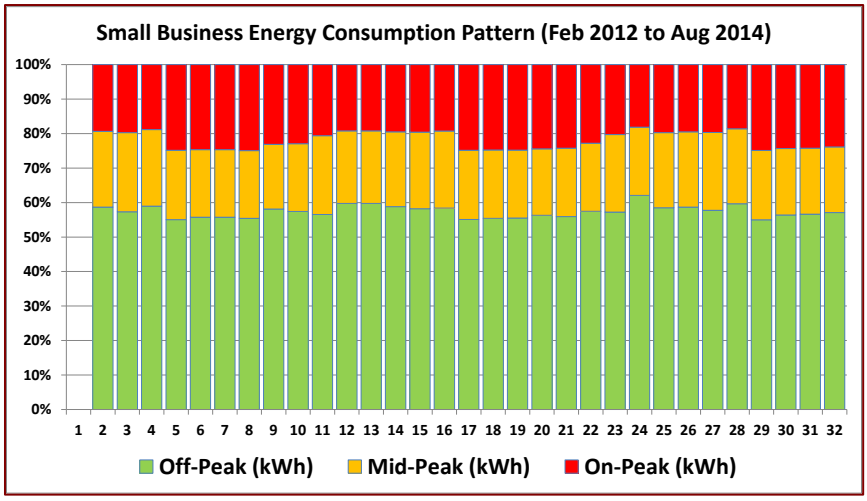


Figure 2-6, Small Business Energy Consumption Pattern

The small business sector (i.e. customers classified as "*General Service less than 50 kW*") is non-homogeneous ranging from an advertising billboard with photocell-controlled lighting loads to a neighbourhood convenience store with significant refrigeration load. One cannot make general statements about the prevailing opportunities for load shifting within this customer category.

2.2 Other Board-Approved CDM Programs

In 2013, London Hydro neither made application for Board-approved CDM programs nor were any such programs executed in London Hydro's franchise service territory.

3 OPA-CONTRACTED PROVINCE-WIDE CDM PROGRAMS

3.1 General Overview

The Ontario Power Authority (OPA) is a provincial agency established by Bill 100, *The Electricity Restructuring Act, 2004* which set out several objectives for the organization, including (but not limited to):

- To engage in activities that facilitates load management.
- To engage in activities that promotes electricity conservation and the efficient use of electricity.

In carrying out the "*conservation*" component of its mandate, the OPA is responsible for the design of a portfolio of provincial energy conservation and demand management programs that are referred to in the industry as Tier 1 CDM programs. Toward this goal, the OPA has developed a number of provincial CDM initiatives geared to the following customer classifications:

- Residential Customers
- Commercial and Institutional (C&I) Customers
- Low-Income Customers
- Industrial Customers

From an LDC perspective, customers are classified somewhat differently. For 2013, the customer classifications and the number of London Hydro customers in each tariff classification are shown in Table 3-1 below.[3]

Table 3-1, London Hydro's 2013 Customer Profile

Tariff Classification	Customer Count
Residential	137,191
General Service < 50 kW	12,084
General Service > 50 kW	1,639
Large User > 5,000 kW	3

Customers in the "*general service < 50 kW*" tariff classification would generally be considered "*small business*" customers, e.g. clothing stores, independent restaurants, dry cleaners, medical offices, beauty salons, convenience stores, gas stations and repair garages, and other small retailers. It will be seen that there are special provincial CDM programs (such as saveONenergy SMALL BUSINESS LIGHTING) within the OPA's "*commercial and institutional*" portfolio that are specifically directed to these customers.

[3] Ontario Energy Board publication: *2013 Yearbook of Electricity Distributors*; August 2014; page 61

Customers in the "*general service > 50 kW*" and "*large user > 5,000 kW*" tariff classifications would generally be eligible for multiple CDM programs within the OPA's "*commercial and institutional*" and "*industrial*" portfolios of CDM programs.

The contractual relationship between the OPA and the community of LDC's that operate as delivery agents within their respective franchise service territories is governed by a so-called *Master CDM Program Agreement*. The various provincial CDM programs are included as "*Schedules*" to the Master CDM Program Agreement.

The CDM program name identified on the various schedules often bears little resemblance to the marketing (or customer-facing) name of the program. As such, Appendix C herein provides a cross-reference between the marketing name for each Tier 1 CDM program and the program name that is used on the Schedules for the *Master CDM Program Agreement*. Also included in this cross-reference table is the date that the various Schedules were posted to the LDC community and the date that London Hydro formally registered as the delivery agent for each program.

For residential customers, London Hydro operates the saveONenergy FOR HOME suite of CDM programs that are individually described in Section 3.2.1 (starting on page 14 herein).

For commercial, institutional and industrial customers, London Hydro operates the saveONenergy FOR BUSINESS suite of CDM programs that are individually described in Section 3.2.2 (starting on page 18 herein).

For those residential customers that fulfill the eligibility criteria for "*low income*", London Hydro also operates the saveONenergy HOME ASSISTANCE program that is described in Section 3.2.3 (starting on page 26 herein).

3.2 Program Descriptions

3.2.1 Residential CDM Programs

The portfolio of residential CDM programs fall under the umbrella saveONenergy™ FOR HOME brand as illustrated in Figure 3-1 below.

Figure 3-1, saveONenergy FOR HOME Branding

The saveONenergy FOR HOME portfolio includes the following elements:

- saveONenergy FRIDGE & FREEZER PICKUP program;
- saveONenergy HEATING & COOLING INCENTIVE program;

- saveONenergy *peaksaver* PLUS™ program;
- saveONenergy COUPON EVENT program; and
- saveONenergy EXCHANGE EVENT program.

The individual residential programs are outlined in the subsections below. Complete descriptions of the various residential consumer initiatives can be found on the saveONenergy website at URL:: https://saveonenergy.ca/Consumer.aspx

3.2.1.1 saveONenergy FRIDGE & FREEZER PICKUP –

Residential customers with a fridge or freezer that is 20 years or older can have the OPA's provincial contractor pick the unit up for free from the customer's home and recycle the unit in an environmentally-friendly manner. Window air conditioners and dehumidifiers will also be picked up by the contractor if a refrigerator or freezer is being picked up.

Note: This initiative is essentially a continuation and re-branding of the Ontario Power Authority's Great Refrigerator Round-Up program.

Note: Commencing in January 2013 there is a change in the eligibility criteria whereby appliances will need to be 20 years or older (as opposed to the 15 year criterion that was in effect for 2011 and 2012).

Figure 3-2, saveONenergy FRIDGE & FREEZER PICKUP Branding

The saveONenergy FRIDGE & FREEZER PICKUP program operates year round.

For this program, the OPA centrally contracts for province-wide marketing, a call center, appliance pickup, and appliance decommissioning.

London Hydro's involvement is limited to active program promotion within its franchise service territory. Examples of program promotional material are included as Appendix A herein.

3.2.1.2 saveONenergy HEATING & COOLING INCENTIVE –

Residential and small business customers are eligible for a rebate if they purchase and arrange for a participating HVAC contractor to replace central heating or cooling equipment with premium-efficiency units. A premium-efficiency unit would be a natural gas furnace with a high-efficiency blower motor (often referred to as an electronically-commutated motor or ECM blower motor) or a central air conditioner unit that is ENERGY STAR qualified.

Figure 3-3, saveONenergy HEATING & COOLING INCENTIVE Branding

The saveONenergy HEATING & COOLING INCENTIVE program operates year round.

Note: This initiative is essentially a continuation and re-branding of the Ontario Power Authority's *Cool Savings Rebate* program

For this program, the OPA centrally contracts for province-wide marketing, and the registration of HVAC contractors that meet the OPA's eligibility requirements.

For this program, London Hydro's involvement is limited to active program promotion within its franchise service territory.

3.2.1.3 saveONenergy *peaksaver* PLUS™ -

The *peaksaver* initiative involves the installation of a remotely-activated load control switch (by London Hydro's contractor) to control the operation of central air conditioners for short periods of time when there is a generation shortfall or constraint on the provincial transmission grid.

Participants in the program receive an in-home electricity monitor that provides near real-time feedback on the amount of electricity the participant is consuming at any particular time, and the amount of money the participant is spending on electricity consumption, based on the prevailing electricity rates.

Figure 3-4, saveONenergy peaksaver PLUS Branding

Given that this initiative is primarily for the cycling control of central air conditioning during summer heat waves, from a practical and effectiveness perspective, program promotion and installation of control equipment would generally be limited to late spring and early summer.

For this program, the Ontario Power Authority contracts with a central demand response aggregator to initiate a demand response event via wireless paging signals. Alternatively, the LDC can assume responsibility for dispatching signals within its franchise service territory.

London Hydro's role includes promotion of the *peaksaver* PLUS initiative, enrollment of customers, and the procurement and installation of control technology for the cycling control of central air conditioner systems.

While London Hydro has enrolled to deliver the *peaksaver* PLUS program within its franchise service territory, there are technology issues associated with the requisite in-home display that preclude London Hydro from offering this program in 2013. The challenges are fully described in London Hydro Report EM-12-01, *Strategy for Supplying In-Home Displays for the peaksaver-PLUS® Residential CDM Program*. Courtesy copies of this document were provided to both the Ontario Power Authority and Ministry of Energy.

3.2.1.4 saveONenergy COUPON EVENT –

Coupon events are held in both the Spring and Fall each year. Coupons provide discounts for the purchase of a variety of energy-efficient products (e.g. compact fluorescent lamps, weather stripping, hot water pipe wrap, timers, programmable thermostats for baseboard heaters, etc.) from participating retailers.

Figure 3-5, saveONenergy COUPON EVENT Branding

For this program, the OPA centrally contracted for the printing and distribution of coupon booklets across Ontario, and entered into agreements with retailers to honor the coupons. The coupons in these booklets could be used throughout the year.

London Hydro's involvement was limited to distribution of additional coupon booklets at local events within its franchise service territory. There was also provision whereby customers could electronically download coupon booklets from an LDC's website.

Note: This initiative is essentially a continuation and re-branding of the Ontario Power Authority's *Every Kilowatt Counts* power savings coupons program

London Hydro distributed coupon booklets at numerous events during promotion or recognition of conservation initiatives. London Hydro sponsors many local community groups, environmental initiatives and employer-hosted events. Such events are natural places to promote the coupon booklets. In recognition of the participation in our commercial retrofit programs, London Hydro often prepares information for employees of such companies to participate at home in the available residential programs.

3.2.1.5 saveONenergy EXCHANGE EVENT –

Customers with dehumidifiers that are at least 10 years old and in working condition can drop off their old units at participating retailers (on defined dates each Spring) and receive a $50 coupon towards the purchase of a new ENERGY STAR® qualified dehumidifier.

Figure 3-6, saveONenergy EXCHANGE EVENT Branding

Note: When this program was initially introduced in 2011, it covered both room air conditioners and dehumidifiers. In 2012 there was a appreciable decrease in the number of room air conditioners being received through the program. A subsequent review showed the greatly diminished quantities of room air conditioners had a negative impact on the overall cost effectiveness of the program, and hence room air conditioners was removed for the 2013 program offering.

For this program, the Ontario Power Authority contracts with participating retailers for the collection of eligible units and redemption of discount coupons. In 2013, the only retail chain that participated was Canadian Tire stores.

London Hydro's involvement is limited to supporting participating retailers that request a London Hydro presence at their events.

3.2.2 Commercial, Industrial and Institutional CDM Programs

The portfolio of commercial, industrial and institutional CDM programs fall under the umbrella saveONenergy FOR BUSINESS brand as illustrated in Figure 3-7 below.

Figure 3-7, saveONenergy FOR BUSINESS Brand

The saveONenergy FOR BUSINESS portfolio includes the following elements:

- saveONenergy DEMAND RESPONSE program;
- saveONenergy SMALL BUSINESS LIGHTING program;
- saveONenergy RETROFIT PROGRAM;
- saveONenergy AUDIT FUNDING program;
- saveONenergy EXISTING BUILDING COMMISSIONING program;

- saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION program;
- saveONenergy PROCESS & SYSTEMS program; and
- saveONenergy NEW HOME CONSTRUCTION program.

The individual residential programs are outlined in the subsections below. Complete descriptions of the various residential consumer initiatives can be found on the saveONenergy website at URL:: https://saveonenergy.ca/business.aspx

3.2.2.1 saveONenergy DEMAND RESPONSE –

Demand response programs compensate participating commercial, industrial or institutional customers for curtailing their plant load or activating standby emergency generators at times when wholesale market prices for electricity are high or there is a greater risk to the reliability of the electricity grid due to a generation shortfall or transmission line constraint. At the outset (in 2011), there were two distinct participation streams, namely:

- DEMAND RESPONSE VOLUNTARY DR1 - This voluntary initiative is a flexible way for the participant to earn monthly payments only when the participant chooses to take part in activation notices.
- DEMAND RESPONSE CONTRACTUAL DR3 - This contractual initiative offers higher incentive rates in return for a firm commitment to take part in activation notices.

Figure 3-8, saveONenergy DEMAND RESPONSE Branding

Note: The VOLUNTARY DR1 offering was formally withdrawn from the provincial marketplace on December 4, 2012 due to lack of participation and interest.

The OPA initially qualified five (5) private companies (Direct Energy, Energy Curtailment Specialists Inc., EnerNOC Inc., Constellation Energy Resources, and Rodan Energy) to serve as demand response aggregators in the marketplace. However, two (2) of these companies (Direct Energy and Constellation Energy Resources) ceased offering demand response aggregation services in the Ontario marketplace effective May 1, 2012.[4] London Hydro is not privy to the reasons that these two companies suspended DR aggregation operations in Ontario.

These demand response aggregators usually approach the customers directly. London Hydro's role is simply one of supporting the program, i.e. reassuring eligible

[4] E-mail of September 26, 2013 to Mike Isber (London Hydro) from Amy Snook (OPA); re: *DR*.

customers of the legitimacy of the demand response program, and informing them of the program parameters and the potential opportunity for their organization.

3.2.2.2 saveONenergy SMALL BUSINESS LIGHTING –

Under this program, London Hydro's electrical contractors will provide turn-key lighting upgrades worth up to $1,000 in qualifying small businesses (i.e. those with an electricity demand of less than 50 kW such as clothing stores, independent restaurants, dry cleaners, medical offices, beauty salons, convenience stores, garages and other small retailers) at no cost to the small business customer.

Note: This program is essentially a continuation and rebranding of the Power Savings Blitz initiative.

Figure 3-9, saveONenergy SMALL BUSINESS LIGHTING Branding

The saveONenergy DIRECT INSTALL LIGHTING program operates year round.

London Hydro's involvement includes engaging local electrical contractors to carry out the turnkey energy efficiency measures, approving SMALL BUSINESS LIGHTING applications, carrying out field verification activities (to ensure consistency between the installed energy-efficiency measures and the application), and active program promotion within its franchise service territory.

3.2.2.3 saveONenergy RETROFIT PROGRAM –

This initiative provides substantial financial incentives to commercial, industrial and institutional customers for replacing existing equipment with high efficiency equipment and for installing new control systems that will improve the efficiency of operational procedures and processes. Eligible energy-efficiency measures include, but are not necessarily limited to, the following:

- Lighting retrofits
- Lighting controls
- HVAC re-design
- Chiller replacement
- Variable frequency drives

Note: This program is essentially a continuation and rebranding of the Electricity Retrofit Incentive Program (ERIP).

Figure 3-10, saveONenergy RETROFIT PROGRAM Branding

There are three (3) distinct participation tracks in the RETROFIT PROGRAM, namely:

- Prescriptive projects – The "*prescriptive*" track provides a defined list of end-use energy-efficiency measures and a corresponding per-unit incentive. Examples include upgrades to lighting, motors, unitary A/C, etc.
- Engineered projects – The "*engineered*" track consists of a series of preset calculation worksheets (i.e. spreadsheets) that estimate reductions in peak demand and/or electricity consumption associated with the installation of more energy-efficient equipment or solutions. Electronic worksheets are available for the energy-efficiency measures listed below:
  - Commercial Interior Lighting Engineering Worksheet
  - Commercial High Bay Lighting Engineering Worksheet
  - Commercial Directional Lighting Engineering Worksheet
  - Unitary A/C Engineering Worksheet (i.e. rooftop units and split systems)
  - Variable Speed Drive on Fan Engineering Worksheet
  - Variable Speed Drive on Pump Engineering Worksheet
  - Compressed Air Engineering Worksheet
- Custom projects - The "*custom*" track is available for more complex or innovative solutions not covered in the "*prescriptive*" or "*engineered*" track. Technology, equipment and system improvements are evaluated on their demand and energy-performance. Incentives are paid after installation, and once the savings have been measured and verified.

The saveONenergy RETROFIT PROGRAM operates year round.

London Hydro's involvement includes approving RETROFIT PROGRAM applications, carrying out field verification activities (to ensure consistency between the installed energy-efficiency measures and the application), and active program promotion within its franchise service territory.

Another role that London Hydro takes on is the celebration of successful CDM projects via such avenues as nominating selected energy-efficiency projects as contenders for the Mayor's Sustainable Energy Council's (MSEC)[5] annual *Outstanding EnergySaver Business* recognition initiative. Several nominated projects that received community recognition by MSEC are described in Appendix B herein.

London Hydro promotes the saveONenergy RETROFIT PROGRAM heavily by participating in most meetings and local events hosted by the London Economic Development Corporation (LEDC), the London Property Management Association (LPMA), the Chamber of Commerce, Southwestern Ontario Chapter of the Canadian Manufacturers and Exporters, and similar events where potential participants are likely to attend.

[5] See URL: http://www.msec.london.ca/d.aspx?s=/Main/Business.htm

3.2.2.4 saveONenergy AUDIT FUNDING –

Business customers are eligible for an incentive (up to 50% of the cost of an energy audit, based on requirements that take into account the size and complexity of the buildings) to complete energy audits assessing the potential for energy savings to be achieved through equipment replacement, operational practices, or participation in Demand Response initiatives and other building systems and envelopes projects.

Figure 3-11, saveONenergy AUDIT FUNDING Branding

The saveONenergy AUDIT FUNDING program operates year round.

London Hydro's involvement includes approving AUDIT FUNDING applications and active program promotion to building owners, property managers, and consulting firms within its franchise service territory.

3.2.2.5 saveONenergy EXISTING BUILDING COMMISSIONING –

This initiative applies to commercial and institutional buildings that use chilled water systems for space cooling. Funding is available for hiring an expert to analyze the chilled water system and make recommendations for increasing its energy efficiency and for subsequently implementing the recommended upgrades.

Figure 3-12, saveONenergy EXISTING BUILDING COMMISSIONING Branding

The saveONenergy EXISTING BUILDING COMMISSIONING program operates year round.

London Hydro's involvement includes approving EXISTING BUILDING COMMISSIONING applications and active program promotion to building owners, and HVAC consultants and contractors within its franchise service territory.

3.2.2.6 saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION –

This initiative targets new construction and major renovations in the planning stages by financially rewarding builders and their project decision-makers that exceed the electricity efficiency standards specified in the Ontario Building Code.

Note: This program is essentially a continuation and rebranding of the High Performance New Construction (HPNC) program that was initially launched on March 26, 2008 and was

delivered by Enbridge Gas Distribution Inc. for customers outside the 416 area code, and by Toronto's Better Buildings Partnership for projects within the City of Toronto.

Figure 3-13, saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION Branding

The saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION program operates year round.

London Hydro's involvement includes approving HIGH PERFORMANCE NEW CONSTRUCTION applications and active program promotion to developers, architects and consultants within its franchise service territory.

3.2.2.7 saveONenergy PROCESS & SYSTEMS –

This initiative targets industrial and large commercial, institutional and agricultural customers with (non-lighting) energy-efficiency projects or portfolios that are expected to generate at least 100 MWh of annualized electricity savings. The objectives of this initiative are to:

- offer distribution customers capital incentives and enabling initiatives to assist with the implementation of large projects and project portfolios;
- implement system optimization project in systems which are intrinsically complex and capital intensive; and
- increase the capability of distribution customers to implement energy management and system optimization projects.

Figure 3-14, saveONenergy PROCESS & SYSTEMS Branding

The saveONenergy PROCESS & SYSTEMS initiative is a comprehensive program made up of two complementary streams, namely:

- Energy Efficiency Upgrades -

  This participation stream helps eligible customers to find, to study, and to act on energy-efficiency opportunities via:

  - Funding for Engineering Studies – Usually, applications for capital funding must be supported by a PRELIMINARY or DETAILED engineering study (or both) wherein the umbrella PROCESS & SYSTEMS initiative provides the following funding:

- PRELIMINARY Engineering Study Funding - This is a general assessment of a key process or single system, comparing the cost-effectiveness of the various upgrades available to the customer. Funding of up to $10,000 per study is available.
- DETAILED Engineering Study Funding - Building on the preliminary recommendations, this study provides the customer with all of the in-depth technical and financial information needed to build a solid business case for the energy-efficiency project. Funding of up to $50,000 per study is available.

- Capital Incentives - The capital incentive for participants that elect to deploy an energy-efficiency technology is very attractive and is calculated as the lowest of:
  - $200/MWh of annualized electricity savings;
  - 70% of projects costs; and
  - A one year payback.

- Energy Management and Monitoring

  This participation stream provides a variety of support functions for identifying potential energy efficiency opportunities. The specific sub-initiatives are highlighted following:

  - Funding for an Embedded Energy Manager – Eligible customers can hire an on-site full-time energy manager as a dedicated resource to identify energy-efficiency opportunities. The funding parameters and requisite minimum performance requirements for an Embedded Energy Manager are summarized below:
    - Funding up to 80% of the Embedded Energy Manager's actual annual salary to a maximum amount plus up to 80% of actual reasonable expenses to a maximum amount per year; and
    - Embedded Energy Manager must achieve a minimum of 0.3 MW of peak demand savings and 0.3 MW x Facility Load Factor x 8,760 hours in energy savings each year. Of this, 30% of savings must be achieved without third party incentives.

    Note: There is also a variant Roving Energy Manager program for instances where hiring an Embedded Energy Manager full time by customer is not warranted, or there is simply not enough potential for energy savings. Roving Energy Managers may be employed by an LDC and are available for potential participants for a defined period of time to start identifying opportunities, develop energy-management plans and completing incentive applications.

  - Monitoring and Targeting – For facilities with a minimum annual electricity consumption of 15,000 MWh and a staff member designated as a resident energy manager, the PROCESS & SYSTEMS initiative provides funding, toward 80% of actual eligible costs (less any third party contributions), of up to $75,000 per site to purchase, install and make operational a monitoring and targeting system. The participating customer must contribute a minimum 20%

of the actual project cost. In turn, the facility must demonstrate by the end of the second year of operation, 0.2 MW in peak demand savings and 0.2 MW x Facility Load Factor x 8,760 hours in energy savings.

- Meter Lending Library – The central meter lending library allows LDC's and eligible customers to borrow, for short periods of time, portable measurement instruments that will allow customers to directly measure the load profile for a fan, pump, chiller or an entire industrial system and hence to better quantify the opportunities for energy management and energy efficiency.

The saveONenergy PROCESS & SYSTEMS initiative operates year round.

For this program, the OPA centrally contracts for a Technical Reviewer, an independent third-party engineering firm that reviews the applications, engineering studies, and post-project measurement & verification plans for conformance to engineering principles and compliance with the established program parameters.

London Hydro's role includes active program promotion within its franchise service territory, the development and execution of a variety of legal agreements with the participating customer (covering embedded energy managers, funding of engineering studies, incentives for energy-efficiency projects, etc.), and otherwise providing various types of support to participating customers in the PROCESS & SYSTEMS initiative.

London Hydro's approach to program promotion is based on tried and true one-on-one sales strategies. Specifically:

- London Hydro has initially targeted all customers with a peak demand that is greater than 200 kW and its Manager of Industrial CDM Programs calls on the customer, disseminates information about the opportunity, presents value propositions, and solicits customer interest in moving forward with energy-efficiency opportunities; and
- London Hydro shows up at venues where potential program participants are likely to also be present, such as the London Economic Development Corporation's annual "*For Manufacturers Only*" conference, the London Chamber of Commerce's annual *Business Achievement Awards* event, the Canadian Manufacturers and Exporters annual *Innovation in Manufacturing* event, etc.

Once potential energy-efficiency opportunities have been identified, London Hydro further removes program participation barriers by deploying its expertise to the customer's facility to carry out pre-project and post-project measurements of energy consumption using its roster of calibrated energy management instruments.

3.2.2.8 saveONenergy NEW HOME CONSTRUCTION –

This initiative is designed to encourage home builders and renovators to construct energy-efficient homes in Ontario by incorporating energy-efficiency into their construction or any extensive renovation.

Figure 3-15, saveONenergy NEW HOME CONSTRUCTION Branding

The saveONenergy NEW HOME CONSTRUCTION program operates year round.

London Hydro's involvement includes approving NEW HOME CONSTRUCTION applications and active program promotion within its franchise service territory.

Consistent with its sales-based approach of "*showing up where its customers are*", London Hydro applied for a membership within London Home Builders Association (LHBA) with the intention of engaging London's new home builders both at monthly association meetings and within the membership publication *Bang On*.

Conceptually, London Hydro was interested in using the NEW HOME CONSTRUCTION initiative to both leverage and add value to the London Energy-Efficiency Partnership (LEEP), an existing joint undertaking sponsored by London Home Builders Association and the City of London, and their *LEEP Innovator Initiative*.[6]

Several local builders are active participants in the ENERGY STAR® for New Homes program as well as the local LEEP initiative. Generally builders are very keen to participate in valuable and well organized programs in order to make their homes more marketable.

3.2.3 Low-Income CDM Programs

In Ontario, approximately 16 per cent of households are low-income, and they often occupy older, less energy efficient homes with older appliances. While financial assistance programs are important for helping with energy bills in the short term, providing Conservation and Demand Management (CDM) initiatives targeted at low-income households can have a greater impact by reducing energy bills on a sustained basis.[7] On July 5, 2010, the Minister directed the OPA to develop province-wide CDM programs targeted specifically at low-income consumers as part of its suite of province-wide CDM programs.

The low-income CDM programs are targeted to homeowners and tenants that meet the Low-Income Cut-Off (LICO) criteria and reside in one of the following dwelling types:

- Housing co-operatives;

[6] Publication: *LEEP Innovator Tool-kit – Working together to create a Sustainable Future for the Residents of London*; London Home Builders Association and City of London; January 2008.

[7] Environmental Commissioner of Ontario publication: *Annual Energy Conservation Progress Report, 2010 (Volume One): Managing a Complex Energy System*; pg. 36.

- Social housing buildings and complexes that in London would be under the governance of London Middlesex Housing Corporation;
- Rental apartments wherein the occupant receives some type of social benefit (e.g. the Ontario Ministry of Community and Social Services' "*Ontario Works*" or "*Ontario Disability Support Program*" financial assistance program, the Canadian *Guaranteed Income Supplement*, etc.); and
- Private dwellings wherein the owner-occupant meets pre-defined income eligibility criteria (e.g. recipient of the Ontario *Low-Income Energy Assistance Program* emergency financial assistance program, etc.).

All social and assisted housing may participate in one of the opportunity streams identified following:

- saveONenergy AUDIT FUNDING as previously described in Section 3.2.2.4 (starting on page 22 herein) and saveONenergy RETROFIT PROGRAM as previously described in Section 3.2.2.3 (starting on page 20 herein); or
- saveONenergy HOME ASSISTANCE as described in Section 3.2.3.1 below.

The participation stream is dictated by the defined eligibility parameters for the saveONenergy HOME ASSISTANCE program.

3.2.3.1 saveONenergy HOME ASSISTANCE

The CDM program that is targeted to social and assisted housing is branded saveONenergy HOME ASSISTANCE.

Figure 3-16, saveONenergy HOME ASSISTANCE Brand

The objective of this turnkey initiative is to offer the free installation of energy efficiency measures to income-qualified households for the purpose of achieving electricity and peak demand savings. All eligible customers receive a *Basic* and *Extended Measures Audit*, while customers with electric heat also receive a *Weatherization Audit*. The initiative is designed to coordinate efforts with gas utilities.

The saveONenergy HOME ASSISTANCE program operates year round.

Complete descriptions of this low-income initiative can be found on the saveONenergy website at URL:: https://saveonenergy.ca/homeassistance

London Hydro's involvement includes qualifying eligible customers, supplying and installing energy-efficiency measures (usually via a third-party contractor), and active program promotion within its franchise service territory.

3.3 Participation

3.3.1 Participation in saveONenergy FOR HOME Programs

3.3.1.1 Participation Synopsis

The participation level in the saveONenergy FOR HOME portfolio of CDM programs by customers within London Hydro's franchise service territory is given in Table 3-2 below.

Table 3-2, Participation in saveONenergy FOR HOME Programs

Marketplace Name of CDM Initiative	Program Description	Activity Unit	Program Uptake / Participation Units
FRIDGE & FREEZER PICKUP	Page 15	Appliances	1,970
HEATING & COOLING INCENTIVE	Page 15	Equipment	2,889
peaksaver PLUS™	Page 16	Devices	0
COUPON EVENT	Page 17	Coupons	35,273
EXCHANGE EVENT	Page 18	Appliances	108

Note: The entry for "COUPON EVENT" includes redemptions for the "*instant coupons booklet*" and the in-store coupons available at bi-annual retailer events.

The foregoing information was provided to London Hydro by the Ontario Power Authority pursuant to their obligations under Clause 8.2, *Reporting Requirements*, of the *Master CDM Program Agreement*. With the exception of the *peaksaver* PLUS program, there is no mechanism for London Hydro to verify the forgoing results.

3.3.1.2 saveONenergy FRIDGE & FREEZER PICKUP Participation Insight

Throughout 2006 and partway into 2007, London Hydro ran its comprehensive and highly successful *Chill Out – London* residential appliance recycling program wherein 14,463 refrigerators, freezers and room air conditioners were harvested. Given London Hydro's residential customer base at the time of 127,000 accounts, this represented an uptake in excess of 11%.

Throughout the duration of the Ontario Power Authority's successor *Great Refrigerator Round-Up* appliance retirement program, as anticipated, there wasn't a significant volume of refrigerators and freezers available for retirement, and the volumes decreased over time.

With the introduction of the Ontario Power Authority's saveONenergy FRIDGE & FREEZER PICKUP program, London Hydro sought unique methods of increasing the accessibility of the program and thereby hopefully maximizing the volume of retired refrigerated appliances. The City of London's Environmental & Engineering Services division operates three (3) drop-off stations (referred to as "*Community EnviroDepots*") for waste and material recycling that collectively attracts 100,000 drop-off visits by London residents each year.

London Hydro sought and received permission from the OPA to host a drop-off program for fridges and freezers for London residents.[8] [9] By leveraging the City's existing marketing and awareness campaigns, London Hydro has been able to sustain satisfactory annual volumes.

Note: Previously, the municipal EnviroDepots would not accept refrigerated appliances. The onus was on the London residents to arrange for appliance disposal via one of several local contractors certified for the removal and recycling of Freon™ refrigerant and incur the contractor's prevailing service fee.

Figure 3-17 below shows the distribution of appliance pickup locations throughout 2013. It can be seen that 60% of the total number of appliances were picked up from the three (3) community EnviroDepots (labeled as "*municipality*" on the chart). It isn't clear why customers would choose dropping an appliance off at a municipal EnviroDepot over the convenience of a contractor coming directly to the customer's home, but nonetheless this expanded option proved successful.

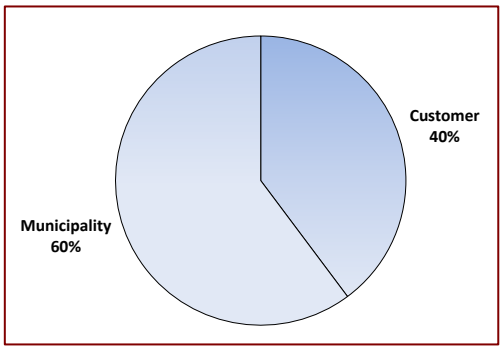


Figure 3-17, Appliance Pickup Locations for 2013

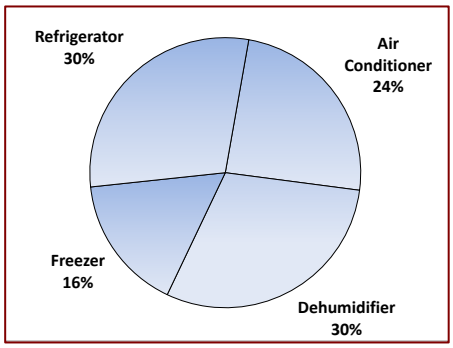


Figure 3-18, Appliances Dropped-Off at Municipal EnviroDepots

Note: While the number of refrigerated appliances has been diminishing over time (with 2,458 in 2011, 2,370 in 2012 and 1,970 in 2013), the popularity of the community EnviroDepots has steadily increased from 17% in 2011 to 60% in 2013. The reason for these trends isn't apparent.

Figure 3-18 above shows the distribution of retired appliances that customer's dropped off at the EnviroDepots. It was originally thought that customers would be most likely to take the smaller appliances (e.g. room air conditioners and

[8] E-mail dated June 3, 2011 to Mayuran Srikantha (Ontario Power Authority) from Hans Schreff (London Hydro); re: *London Hydro's Fridge Municipality Plan*.

[9] E-mail dated July 6, 2011 to Hans Schreff (London Hydro) from Katherine Sparkes (Ontario Power Authority); re: *London Hydro's Fridge Municipality Plan*.

dehumidifiers) to the EnviroDepots and arrange for the provincial contractor to pick up the larger appliances (e.g. fridges and freezers) at the home. This is evidently not the case as there are almost as many big appliances being dropped off at the community EnviroDepots as small appliances.

Finally, Figure 3-19 shows the month over month distribution of appliance pickups. The pattern does change every year, but the underlying reasons for these changes aren't apparent.

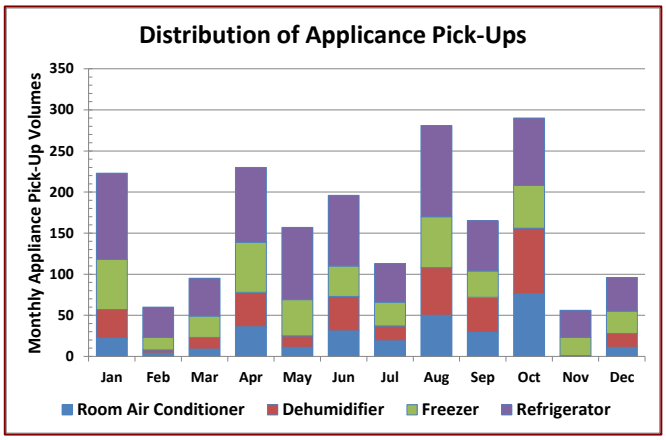


Figure 3-19, Monthly Appliance Pickup Volumes

3.3.1.3 saveONenergy HEATING & COOLING INCENTIVE Participation Insight

The overall participation in the saveONenergy HEATING & COOLING INCENTIVE program (as previously listed in Table 3-2) has been subdivided into customers that elected to install an energy-efficient ECM blower motor in their new furnace, and customers that elected to upgrade their central air conditioning system to an ENERGY STAR qualified unit.

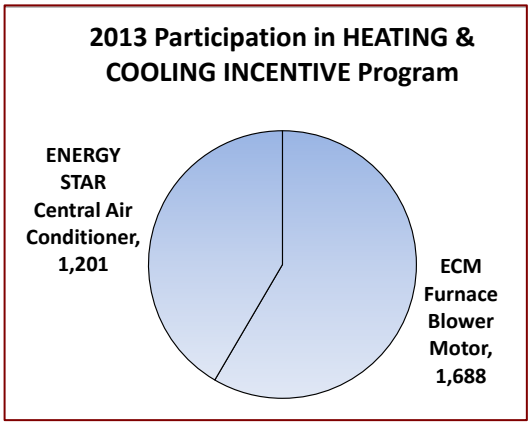


Figure 3-20, 2013 Participation in HEATING & COOLING INCENTIVE Program

Note: The central air conditioner category labeled "ENERGY STAR" includes both central air conditioner units with a minimum 14.5 SEER rating and the higher-efficiency CEE Tier 2 units with an associated minimum 15 SEER rating.

This information is depicted in Figure 3-20. It will be observed that the customer uptake for energy-efficient furnace blower motors is 40% greater than the number of customers that elected an ENERGY STAR qualified central air conditioner.

The month by month participation levels for each type of energy-efficiency upgrade is depicted in Figure 3-21.

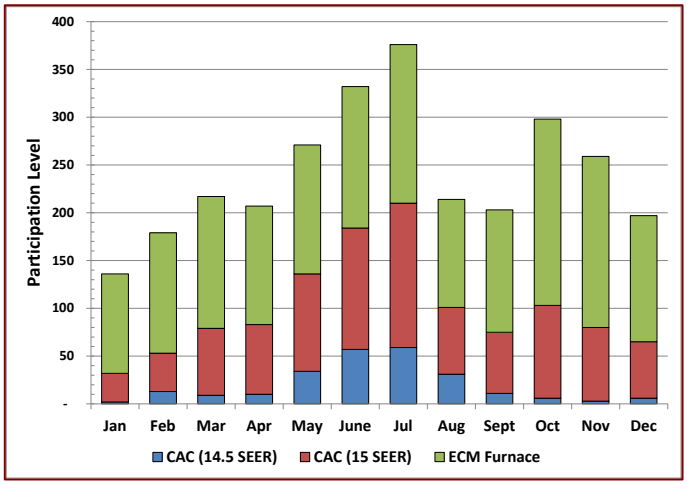


Figure 3-21, Month by Month Participation Levels

Even though the chart reflects the HVAC contractor's submission approval date (as opposed to the date of installation), the furnace upgrades (with energy-efficient integral ECM blower motors) are relatively constant throughout the year. As might be expected the volume of HVAC upgrades peaks throughout the summer cooling months of May, June, July and August. The fact that central air conditioners are being upgraded throughout the year suggests that significant numbers of participants are having their central air conditioner upgraded at the same time that they are replacing their forced air furnace.

And finally, the net annual energy savings and demand reduction attributable to participation in this program is illustrated in Figure 3-22 and Figure 3-23 respectively.

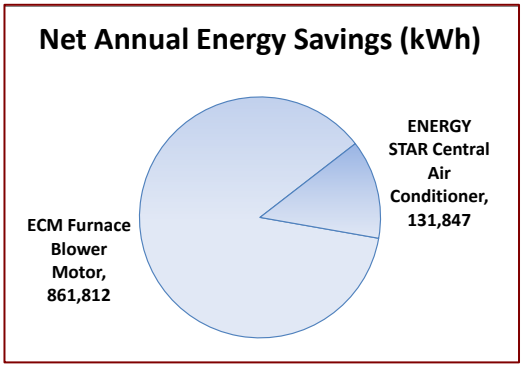


Figure 3-22, Net 2013 Annual Energy Savings Attributable to Program

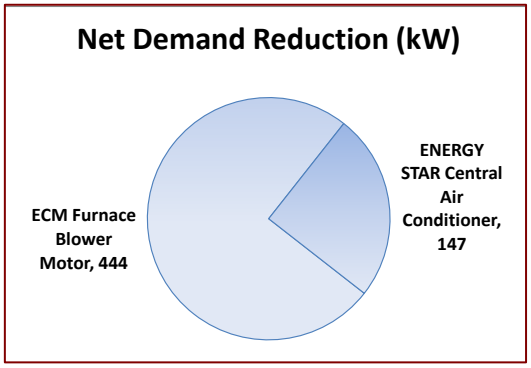


Figure 3-23, Net Demand Reduction Attributable to Program

As noted in a published Natural Resources Canada study on the subject,[10] electricity consumption by a furnace blower is significant, and is comparable to the annual electricity consumption of a major appliance. Since the same blower unit is also used during the summer to circulate cooled air in centrally air conditioned homes, electricity savings occur year round.

[10] Natural Resources Canada report: *Final Report on the Effects of ECM Furnace Motors on Electricity and Gas Use: Results from the CCHT Research Facility and Projections*; John Gustorf, Skip Hayden, Evgueniy Enchev, Mike Swinton, Craig Simpson and Bill Castellan; August 2003.

Whereas there are 104 listings for HVAC contractors found in the local Yellow Pages, the Ontario Power Authority's on-line listing of participating contractors[11] has 52 entries for London. Although this appears as only a 50% HVAC contractor participation rate, this number may not relate to the overall percentage of sales offerings as all of the larger more well established HVAC contractors are participants. A more useful parameter would be insight into program uptake (i.e. the number of consumers that participate in the HEATING & COOLING INCENTIVE program) in comparison to the overall number of purchased furnaces and central air conditioning systems. Unfortunately the manufacturers tend to consider local sales information confidential in nature.

3.3.2 Participation in saveONenergy FOR BUSINESS Programs

3.3.2.1 Participation Synopsis

The participation level in the saveONenergy FOR BUSINESS portfolio of CDM programs by customers within London Hydro's franchise service territory is given in Table 3-3 below.

Table 3-3, Participation in saveONenergy FOR BUSINESS Programs

Marketplace Name of CDM Initiative	Program Description	Activity Unit	Program Uptake / Participation Units	
DEMAND RESPONSE -	Page 19			
• DEMAND RESPONSE CONTRACTUAL DR3	"	Facilities	12	
SMALL BUSINESS LIGHTING	Page 20	Projects	154	
RETROFIT PROGRAM	Page 20	Projects	324	
AUDIT FUNDING	Page 22	Audits	17	
EXISTING BUILDING COMMISSIONING	Page 22	Buildings	0	
HIGH PERFORMANCE NEW CONSTRUCTION	Page 22	Buildings	1	
PROCESS & SYSTEMS	Page 23			
• Preliminary Eng. Study	"		0	
• Detailed Engineering Study	"		4	
• Project Incentive	"	Projects	0	*
• Monitoring & Targeting	"	Projects	0	*
• Embedded Energy Manager	"	Projects	21	
NEW HOME CONSTRUCTION	Page 25	Homes	0	

[11] See URL:: http://www.hraiheatingcoolingincentive.ca/pages/search.php?act=post

* The "0" entries are not technically correct, but participants are only counted when payments have been made by the OPA. Refer to the relevant "*Participation Insight*" subsections for further detail.

The DEMAND RESPONSE information was provided to London Hydro by the Ontario Power Authority. There is no mechanism for London Hydro to verify these participation numbers.

3.3.2.2 saveONenergy SMALL BUSINESS LIGHTING Participation Insight

The saveONenergy SMALL BUSINESS LIGHTING program is essentially a re-branded version of the former *Power Savings Blitz* initiative. London Hydro was very aggressive with the *Power Savings Blitz* program and, with the exception of the small businesses with certain types of lighting, program uptake was significant, meaning that the residual opportunity for the saveONenergy SMALL BUSINESS LIGHTING program is very limited.

Last year's annual CDM report[12] spoke of the reactive approach that London Hydro took throughout 2011 and 2012 primarily due to:

- The lack of appropriate and affordable lighting solutions in the marketplace for specific retail applications; and
- The confusion caused by the OPA's re-interpretation of their eligibility rules, and the subsequent delay in getting the needed program changes finally implemented.

The advent of LED lighting now provides a solution for small business customers that were skipped with the Power Savings Blitz program.

London Hydro achieved moderate success with this program throughout 2013 primarily due to extensive mining of LDC data and combining this data with other sources of data. It is not likely that an independent contractor without access to such data sources could be as effective in seeking out potential program participants.

3.3.2.3 saveONenergy RETROFIT PROGRAM Participation Insight

The overall number of saveONenergy RETROFIT PROGRAM projects carried out in 2013, as identified in Table 3-3 above, can be divided into lighting upgrades and non-lighting upgrades (e.g. upgrades to HVAC systems, compressed air systems, motors, fan and pump, variable frequency drives, and other energy-efficient non-lighting technologies).

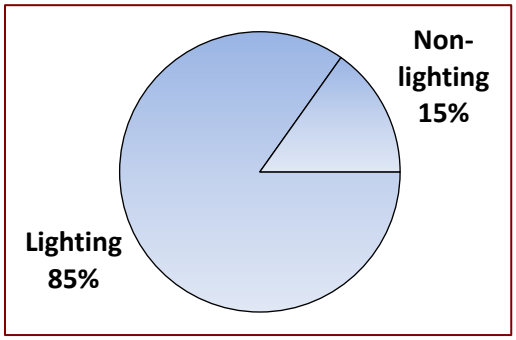


Figure 3-24, Classifications of 2013 Retrofit Projects

[12] London Hydro Report EM-13-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2012 Activities and Achievements*; September 2013; Section 3.3.2.2, *saveONenergy SMALL BUSINESS LIGHTING Participation Insight*; pg 33 – 36.

This distribution is illustrated in Figure 3-24 where it is seen that currently lighting retrofits represent about 85% of the energy-efficiency projects. It can be shown that lighting retrofit projects represents 85% of the net demand reduction and 80% of the net energy savings associated with the saveONenergy RETROFIT PROGRAM.

Note: In London Hydro's annual report of 2011 CDM activities and achievements, "*lighting*" projects provided 98% of the gross demand reduction associated with the saveONenergy RETROFIT PROGRAM within London Hydro's franchise service territory. The shift to a greater attribution from "*non-lighting*" projects is reflective both of lighting projects being smaller scale than previously combined with greater success with HVAC and VFD projects.

It should not be inferred from Figure 3-24 that lighting retrofits are more valuable than the implementation of other types of energy-efficiency technologies. Rather, in London Hydro's franchise service territory, the lighting supply chain has been trained and effectively uses the RETROFIT PROGRAM as an integral part of its sales strategy. More effort needs to be expended to expand participation amongst the supply chain for other energy-efficiency technologies such as HVAC systems, VFD technology, etc.

It should be noted that in the near future, the most common types of lighting retrofits (e.g. conversion of T12 fluorescent lamps with magnetic ballasts to T8 fluorescent fixtures with electronic ballasts, and replacement of incandescent bulbs with compact fluorescent lamps) will become less and less valuable within a CDM portfolio on account of impending changes to Canadian energy efficiency regulations covering fluorescent and incandescent lighting.

Note: Since early 2007 almost all governments that hold membership in Organization for Economic Co-operation and Development (30 countries that are high-income, and considered developed) have announced policies aimed at phasing-out incandescent lighting within their jurisdictions. The intention of the regulations already adopted or under preparation is to encourage the usage of higher efficiency lamps and most notably CFLs in place of standard incandescent lamps and thereby eliminate a major source of energy waste.[13]

Amendment 12 to Canada's Energy Efficiency Regulations was published on November 9, 2011 in the Canada Gazette, Part II. The minimum energy efficiency performance standard (i.e. the effective phase-out) for 100 and 75 watt light bulbs will apply as of January 1, 2014 and for 60 and 40 watt light bulbs on December 31, 2014.

Under the same energy efficiency regulations, magnetic ballasts for T12 linear fluorescent fixtures were no longer available as replacement ballasts as of April 1, 2010.

As the phase-out date for the older inefficiency lighting technologies approaches, LDC's should anticipate that the free-ridership rates (arising from the program EM&V exercise) will skyrocket, i.e. participants no longer need an incentive to encourage such lighting retrofits – replacement lamps and ballasts will no longer be readily available in the marketplace, and customers will have little choice but to retrofit their installed base of lighting fixtures.

[13] International Energy Agency publication: *Phase out of incandescent lamps - Implications for international supply and demand for regulatory compliant lamps*; Paul Waide; April 2010.

3.3.2.4 saveONenergy AUDIT FUNDING Participation Insight

With the aim of protecting the customer's interest, London Hydro thoroughly reviews the audit reports for accuracy and completeness. The quality of the submitted audits is highly variable and, of the seventeen (17) audit reports completed in 2013, all were returned to the audit firm for rework and resubmission at least once.

Note: The most common problem encountered is the lack of specific information regarding the projected demand reductions and energy savings. Once this information is provided, it is frequently found that the applicable incentive is incorrectly calculated. An incentive that is under-stated may prevent the energy-efficiency project from proceeding, and an over-stated incentive results in a disappointed customer when an incentive application is later submitted.

Presently, by the time the audit report is submitted to the LDC, the audit firm has been paid in full by the customer and the customer is seeking reimbursement from the OPA via the LDC. If this trend of deficient or marginal-quality audit reports continues, London Hydro may start advising applicants to only pay their audit firm an initial 50% with the final 50% payable when London Hydro has deemed the audit report to be complete and accurate.

3.3.2.5 saveONenergy EXISTING BUILDING COMMISSIONING Participation Insight

London Hydro uses a classical sales approach in all its CDM endeavors. This process consists of four steps, namely:

- Prospecting – the development of leads and beginning relationships that lead to uptake in CDM initiatives;
- Qualifying prospective participants – determining the interest and viability of a CDM initiative;
- Presenting – pitching a CDM initiative in a way that meets a participant's needs or adds value; and
- The Close – initiating the application process for a CDM initiative.

Participation throughout 2013 in this initiative in London matches the provincial uptake throughout 2013 – zero – because it is not readily possible to get to even the first step in the sales model.

The saveONenergy EXISTING BUILDING COMMISSIONING program is by definition limited to *commercial and institutional buildings that use chilled water systems for space cooling*. One of the challenges that London Hydro has discovered with this initiative is at the initial "*prospecting*" step. To date, no convenient method has been found to identify buildings that meet the eligibility requirements, and in the limited conversations at various local venues (e.g. LEDC trade shows), the decision-makers for various commercial and institutional buildings don't seem to know exactly what technology is used for space cooling in their respective buildings.

Clearly the LDC community needs to find an effective method of targeting prospective customers with this energy-efficiency opportunity.

In November 2012, London Hydro commenced discussions with CEM Engineering concerning methods that could be used to target prospective buildings. This led to a formal engagement in March 2013 and the delivery of their final report[14] in August 2013. This subject will be further discussed in next year's annual report of CDM activities and achievements.

3.3.2.6 HIGH PERFORMANCE NEW CONSTRUCTION Participation Insight

Throughout 2013, the uptake within London for the saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION program was one (1) building, whereas the entire provincial uptake was only eighty-six (86) buildings.

Note: Given that London's population is roughly 3% of the provincial population,[15] the local program uptake is on par with the provincial uptake rate (even though there is significantly more new building construction occurring in the Greater Toronto Area (GTA) and Ottawa.

In London Hydro's annual report of 2011 CDM activities and achievements,[16] it was noted that Supplementary Standard SB-10, *Energy Efficiency Supplement*, that amends the Ontario Building Code, came into effect for all buildings constructed after December 31, 2011. In essence, the energy-efficiency performance that was formerly associated with an ENERGY STAR qualified building or dwelling unit has become the baseline requirement of the Ontario Building Code.

The limited feedback that London Hydro has received is that the program is considered unduly administratively cumbersome and the available incentives are considered insufficient to greatly exceed the newer more stringent building code requirements.

3.3.2.7 saveONenergy PROCESS & SYSTEMS Participation Insight

Recall from the program description in Section 3.2.2.7 (starting on page 23 herein) that the saveONenergy PROCESS & SYSTEMS initiative is an umbrella program that encompasses a number of sub-programs, namely funding (or partially funding) Preliminary Engineering Studies, Detailed Engineering Studies, and Embedded Energy Managers. It also provides incentives for energy-efficiency projects and the installation of Monitoring & Targeting systems.

London Hydro's commentary is therefore divided into several topic areas as follows:

- Embedded Energy Managers –

[14] CEM Engineering Report #2337-RPT-01, *Prequalifying Buildings in Downtown London for HVAC Recommissioning Potential*; August 21, 2013.

[15] Source: Ontario Ministry of Finance publication: *Ontario Fact Sheet September 2013*. See URL:: http://www.fin.gov.on.ca/en/economy/ecupdates/factsheet.html

[16] London Hydro Report EM-12-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.6.7, *Energy Efficiency Supplement to the Ontario Building Code*; pg 52 – 53.

In 2013, three (3) of London Hydro's customers (1 industrial and 2 institutional customers) had funded Embedded Energy Managers in place. Another institutional customer received approval to employ an Embedded Energy Manager but has not yet been successful finding in finding a suitable candidate.

The terms for the three Embedded Energy Managers are shown pictorially in Table 3-10 (on page 49 herein). Based on their successes, all three agreements were extended for another year.

- Monitoring & Targeting Systems –

  In-plant Monitoring & Targeting Systems (also referred to in the literature as "*Energy Management Information Systems*") are not well understood by decision-makers and represent a significant investment. The fact that the provincial uptake has been zero is perhaps not surprising.

  In the Fall of 2012, London Hydro prepared a business case[17] for presentation to the joint EDA/OPA Industrial CDM Working Group suggesting a variant of the present M&T program whereby the OPA would mitigate perceived risk to potential participants by advancing a portion of the overall incentive funding threshold for preparation of a value proposition for M&T Systems. Unfortunately, London Hydro was not able to obtain any traction from the OPA for this suggested program improvement.

  Nonetheless, London Hydro understands that CDM is largely a sales exercise and success comes from eliminating participation barriers. As a consequence, London Hydro proceeded with a scheme whereby it would risk its own money to finance the preparation of M&T System Feasibility Studies (with predefined content requirements) by consultants. The participant would then reimburse London Hydro from the first incentive payment associated with their M&T System.[18]

  It would appear that this approach is removing a very real participation barrier in the marketplace as London Hydro now has two (2) manufacturing sector customers that are deploying in-plant M&T Systems with in-service dates in 2013.

- Preliminary & Detailed Engineering Studies –

  Although Table 3-3 (on page 32 herein) indicates no activity with respect to Preliminary and Detailed Engineering Studies, one of each type were initiated. Specifically:

  - One (1) Preliminary Engineering Study (PES) for a large commercial refrigeration system was carried out in 2012, but reimbursement wasn't made until 2013. In this case, the participant elected to proceed expediently with their energy-efficiency opportunities as RETROFIT PROGRAM projects (as opposed to the contractually cumbersome PROCESS & SYSTEMS projects).

[17] London Hydro document: *saveONenergy PROCESS & SYSTEMS: Business Case to Adjust the Monitoring & Targeting Initiative*; 5 pages.

[18] Memorandum of August 30, 2012 to Vinay Sharma from Gary Rains, re: *saveONenergy PROCESS & SYSTEMS – Monitoring & Targeting Sub-Program; Advanced Funding of M&T Feasibility Study*.

- One (1) Detailed Engineering Study (DES) for a municipal wastewater treatment plant was started in 2012, but not completed and paid until 2013. Five (5) additional Detailed Engineering Studies were initiated in 2013, but three (3) of these aren't expected to be completed until 2014.

- Providing Incentives for Energy-Efficiency Projects –

  As noted in London Hydro's annual report of 2011 CDM activities and achievements,[19] several industrial customers that initially expressed great interest in the PROCESS & SYSTEMS abandoned further pursuit of the opportunities due to a variety of documented (and totally unnecessary) program barriers, e.g. solvency certificate, term of agreement, etc.

  Although Table 3-3 indicates no capital incentive projects underway for 2013, there were two projects underway (one for an industrial compressed air system and the second for a plastics extrusion process) with declared in-service dates of September 1st, 2013 and December 1st, 2013. The results for these projects aren't reported until after the first quarterly report has been submitted and approved. As such, energy savings for these projects won't appear until early 2014.

3.3.2.8 saveONenergy NEW HOME CONSTRUCTION Participation Insight

There was virtually no uptake on this program throughout the province during 2011, 2012 and 2013 (i.e. 26 homes province-wide in 2011, 19 homes province-wide in 2012 and 86 hom3w province-wide in 2013) for a number of reasons as identified a year ago in London Hydro's annual report of 2011 CDM activities and achievements.[20]

The OPA's flawed and cumbersome web-based user interface (where applications are entered by the homebuilder) was eventually replaced by a couple of Excel spreadsheets (i.e. New Home Construction *Preliminary Application* and *Final Application* Worksheets). Whereas it was understood by the LDC community in the Fall of 2011 that the requisite improvements to the participant interface would be implemented summarily, the replacement worksheets weren't introduced to the LDC community until March 2013! [21] This is but one factor that stifled program participation in 2013.

[19] London Hydro Report EM-12-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.3.2.7, *saveONenergy PROCESS & SYSTEMS Participation Insight*; pg 34 - 35.

[20] London Hydro Report EM-12-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.3.2.8, *saveONenergy NEW HOME CONSTRUCTION Participation Insight*; pg 35.

[21] OPA saveONenergy LDC E-BLAST of March 11, 2013; re *Program News - New Home Construction Applications — Easier Than Ever*.

In London Hydro's annual report of 2011 CDM activities and achievements,[22] it was noted that Supplementary Standard SB-10, *Energy Efficiency Supplement*, that amends the Ontario Building Code, came into effect for all buildings constructed after December 31, 2011. In essence, the energy-efficiency performance that was formerly associated with an ENERGY STAR qualified building or dwelling unit has become the baseline requirement of the Ontario Building Code.

The limited feedback that London Hydro has received is that the available incentives are considered insufficient to greatly exceed the newer more stringent provincial building code requirements. As such, the outlook for program participation in 2014 is equally gloomy.

3.3.3 Participation in Low-Income Programs

3.3.3.1 Participation Synopsis

The participation level in the saveONenergy HOME ASSISTANCE program by customers within London Hydro's franchise service territory is given in Table 3-4 below.

Table 3-4, Participation in saveONenergy HOME ASSISTANCE Program

Marketplace Name of CDM Initiative	Program Description	Activity Unit	Program Uptake / Participation Units
HOME ASSISTANCE	Page 27	Units	498

As earlier noted in Section 3.2.3 (starting on page 26 herein), not all social and assisted housing meets the eligibility requirements for the saveONenergy HOME ASSISTANCE program, but instead can realize energy-efficiency opportunities under the saveONenergy RETROFIT PROGRAM.

Although the saveONenergy HOME ASSISTANCE program was theoretically available to LDCs in Q2 of 2011, London Hydro couldn't see how the program could be executed with any degree of effectiveness, didn't subscribe to the program until August, and didn't roll out the program to eligible customers during the remaining months of the year. In hindsight, this was a wise choice as a core element of the program (i.e. the Ontario Power Authority's *Field Audit Support Tool*) was flawed and wasn't properly corrected until late summer 2012.[23] Furthermore, there was no payment process in place for LDC's to recoup their incurred costs for installation contractors and energy-efficient product again until late summer of 2012.

[22] London Hydro Report EM-12-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.6.7, *Energy Efficiency Supplement to the Ontario Building Code*; pg 52 – 53.

[23] Ontario Power Authority E-Blast dated August 24, 2012.

London Hydro has a philosophy of in-house program management for all CDM programs. This allows the utility to maintain a high quality and superior engagement with its customer base.

Note: London Hydro has partnered with Parachute Software to develop iPad-based work management software that will revolutionize the execution effectiveness of this CDM program by all parties (by significantly overcoming the administrative overhead that the OPA incorporated into the design of the initiative).

Roll-out of the saveONenergy HOME ASSISTANCE program within London Hydro's service territory was delayed until the Fall 2012 (for reasons stated above), starting off slowly with "*friendly*" customers to field test and validate the complete end-to-end work management software, procedures, contractor knowledge, and any other glitches before program ramp up.

3.3.3.2 saveONenergy HOME ASSISTANCE Participation Insight

To overcome many of the numerous program design shortcomings of the saveONenergy HOME ASSISTANCE program that were identified in London Hydro's annual report of 2011 CDM activities and achievements,[24] and to execute the program in an effective manner, London Hydro partnered with Parachute Software to develop iPad-based work management software (with the working title "DRAGON") that revolutionizes the execution effectiveness of this CDM program by all parties (by significantly overcoming the administrative overhead that the OPA incorporated into the design of the initiative).

To maximize the value to participating customers, London Hydro partnered with:

- London Fire Department – to replace expired or faulty smoke detectors, replace the batteries in units with depleted batteries, and to provide fire safety information; and

  Note: The data collected to date shows that 90% of low-income dwellings are under-protected from a fire safety perspective.

- City of London – to install water conservation measures (e.g. low-flow toilets, faucet aerators, etc.) and carry out minor plumbing repairs (e.g. fixing leaking toilets and faucets)

London Hydro's contractor also performs a basic electrical safety check of the premise and repairs broken lighting fixtures, replaces broken covers on receptacles and switches, etc.

London Hydro has also engaged a number of social agencies (e.g. Salvation Army, Ontario Works, etc.) to identify eligible customers.

[24] London Hydro Report EM-12-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.3.4.2, *saveONenergy HOME ASSISTANCE Participation Insight*; pg 37 – 38.

Program execution throughout 2013 was very smooth and validated London Hydro's strategic approach of deploying technology and maximizing participant value. In 2014, London Hydro will receive awards and other accolades for its version of the HOME ASSISTANCE program – this will be reported in next years annual CDM report.

3.4 Spending

There are various funding streams available to support the provincial Tier 1 CDM programs. Some monies are available to London Hydro to support its administrative and marketing efforts, some monies are channeled through London Hydro to its designated contractors that provide for example direct install services, and finally significant monies are routed through London Hydro to customers as incentive payments for deploying energy-efficient technologies.

The various funding / spending streams are individually described in the following subsections.

3.4.1 Program Administration Budget (PAB) Spending

LDC's such as London Hydro receive annual funding from the Ontario Power Authority for the administration of the various provincial CDM programs in accordance with a formula that considers the numbers of customers within each tariff classification within the LDC's service territory. This funding is to cover LDC expenses directly related to the execution of the various provincial CDM programs, e.g. program management labour costs, marketing and promotion, legal, procurement, reporting and information technology costs, etc.

Table 3-5 below shows London Hydro's expenditures incurred throughout 2011, 2012 and 2013 to operate the provincial CDM programs. Column 2 shows the available funding threshold and Column 4 shows London Hydro's actual 2013 expenditures.

Table 3-5, CDM Program Expenditures

Target Customer Sector	Available 2013 PAB Funding	Annual Expenditures				Cumul've Spending
		2011	2012	2013	2014	
(Col 1)	(Col 2)	(Col 3)	(Col 4)	(Col 5)	(Col 6)	(Col 7)
Residential	$375,000	$140,841	$227,380	$312,391		$680,612
Commercial	$935,000	$797,212	$810,444	$788,196		$2,395,802
Industrial	$215,000	$60,294	$141,159	$343,307		$544,760
Low-Income	$135,000	$37,652	$184,368	$165,799		$387,819
Total:	$1,660,000	$1,035,999	$1,363,351	$1,609,643		$4,008,993

In Column 4 of Table 3-5, it will be seen that expenditures for the "*low-income*" customer sector exceeded the "*available 2012 PAB funding*" allocation. This was

largely due to the one-time cost associated with development of iPad-based work management software for the saveONenergy HOME ASSISTANCE program. Under the prevailing agreement with Parachute Software (the developer of the product), other LDC's can deploy this same product, but will pay a "per transaction" fee that will be shared by London Hydro and Parachute. As such, as more and more LDC's and their services providers use this software, it is expected that offsetting credits will be posted in 2013 and 2014.

A more comprehensive tabulation of expenses was provided to the Ontario Power Authority pursuant to Article 8.1, *LDC Reporting Requirements*, of the *2011 – 2014 Master CDM Program Agreement*.

PAB is based on actual expenditures, rather than approved budget. As such, any unspent budget will be returned to the OPA.

3.4.2 Participant Based Funding (PBF) Spending

Participant Based Funding (PBF) is to cover the costs of program delivery which are directly related to the actual number of participants in a CDM program (e.g. building audits, equipment and installation for '*direct install*' initiatives, operation and maintenance {O&M} costs for load control devices), excluding customer incentives.

London Hydro's 2013 PBF spending is given in Table 3-6 below.

Table 3-6, Breakdown of Participant-Based Funding Expenditures

CDM Initiative	Annual Expenditures			
	2011	2012	2013	2014
saveONerergy FOR HOME Programs:				
• peaksaver PLUS	--	--	--	
saveONenergy FOR BUSINESS Programs:				
• SMALL BUSINESS LIGHTING	$2,900	$700	--	
Low-Income Programs:				
• HOME ASSISTANCE	--	--	--	
Other CDM Programs:				
Total Annual Incentives:	$2,900	$700	--	

In London, the *peaksaver* PLUS program was not in market (for reasons identified in Section 3.2.1.3 herein). As such, there was no 2013 participant-based spending.

For the saveONenergy SMALL BUSINESS LIGHTING initiative, the auditor assessment charges were categorized as a PBF expenditure in 2011 and partway through 2012. For the remainder of 2012 and throughout 2013, since the small

amounts weren't deserving of special accounting treatment, the auditor assessment charges were considered an element of "*PI*".

3.4.3 Participant Incentives (PI)

Participant Incentives (PI) is to cover the cost of reimbursing LDCs for any cash incentives provided to program participants. This funding is essentially a flow-through from the OPA to program participants, through the LDCs.

The accumulated incentive amounts provided to customers that participated in the various CDM programs is presented in Table 3-7 by CDM program name.

Table 3-7, Breakdown of Incentives Paid to Customers

CDM Initiative	Participant Incentives			
	2011	2012	2013	2014
saveONerergy FOR HOME Programs:				
	--	--	--	
saveONenergy FOR BUSINESS Programs:				
• SMALL BUSINESS LIGHTING	$27,384	$75,624	$198,945	
• RETROFIT PROGRAM	$395,834	$1,777,403	$1,654,993	
• AUDIT FUNDING	$0	$21,812	$137,525	
• EXISTING BUILDING COMMISSIONING	$0	$0	$0	
• HIGH PERFORMANCE NEW CONSTRUCTION	$0	$4,048	$0	
• PROCESS & SYSTEMS	$0	$0	$104,767	
• NEW HOME CONSTRUCTION	$0	$0	$0	
Low-Income Programs:				
	--	$23,752	$359,251	
Other CDM Programs:				
• 2010 ERIP Carry-Over	$3,217,118	$132,536	--	
Total Annual Incentives:	$3,640,336	$2,035,175	$2,455,481	

Note: The monies shown in the above tabulation relate only to energy-efficiency projects completed and paid for in 2013. If, for example, a project was completed in December 2013 but the incentive wasn't paid until early January 2014, then the "*participant incentive*" will not be included in the above tabulation. Also, for reasons outlined in Section 3.6.2, participant incentives related to some *2010 ERIP Carry-Over* projects won't be listed until 2012 or later.

The monetary amounts given in Table 3-7 do not include the Harmonized Sales Tax (HST).

For some mass-market CDM programs, such as the saveONenergy HEATING & COOLING INCENTIVE initiative, the participating customer does receive a monetary incentive from London Hydro for having their chosen HVAC contractor install an ENERGY STAR qualified central air conditioner or a furnace equipped with an energy-efficient ECM blower motor. However, such incentives are provided to the participating customer directly from the Ontario Power Authority (or their agent) and as such are not included in the tabulation above.

3.4.4 Capability Building Funding (CBF)

Capability Building Funding (CBF) is to cover the costs of accessing and/or delivering enabling initiatives (e.g. account manager funding; building operator training) which support and increase program participation and which are not included in PAB.

London Hydro's 2011 to 2013 CBF spending is given in Table 3-8 below.

Table 3-8, Breakdown of Capability Building Funding Expenditures

CDM Initiative	Participant Incentives			
	2011	2012	2013	2014
saveONerergy FOR HOME Programs:				
	--	--	--	
saveONenergy FOR BUSINESS Programs:				
• PROCESS & SYSTEMS	$0	$116,294	$231,162	
• SMALL BUS. LIGHTING	$6,732	$9,999	$32,461	
Low-Income Programs:				
	--	--	--	
Other CDM Programs:				
	--			
Total Annual Incentives:	$6,732	$126,293	$263,623	

Note: The dollars associated with the saveONenergy SMALL BUSINESS LIGHTING initiative relates to incentive monies paid to the assessor / installation contractor in instances where the participating customer elects to undertake energy-efficiency upgrades beyond the $1,000 threshold. In future annual reports, this amount may be relocated to another table if such direction is received.

3.4.5 Summarized CDM Spending for 2013

The expenses incurred by London Hydro and the monies channeled through London Hydro to participating contractors for direct install programs and to participating customers in the form of incentive monies are summarized in Table 3-9 below:

Table 3-9, Overall 2013 Spending for Provincial CDM Programs

Initiative	Program Administrative Budget	Participant Based Funding	Participant Incentives	Capability Building Funding	Total
(Col 1)	(Col 2)	(Col 3)	(Col 4)	(Col 5)	(Col 6)
saveONenergy FOR HOME Programs:					
	$312,391	--	--	--	$312,391
saveONenergy FOR BUSINESS Programs:					
	$1,131,453	--	$2,096,230	$263,623	$3,491,306
Low-Income Programs:					
	$165,799	--	$359,251	--	$525,050
Other CDM Programs:					
	--	--	--	--	--
					$4,328,747

The above costs are insufficient to carry out any type of economic assessment (e.g. Ratepayer Impact Measure Test) of the CDM programs delivered by London Hydro. The costs borne by the OPA for the contractors associated with several of the consumer programs (e.g. saveONenergy FRIDGE & FREEZER PICKUP, saveONenergy HEATING & COOLING INCENTIVE, saveONenergy COUPON EVENT, etc.), the firms that carry out the CDM program evaluation (i.e. EM&V) work, and the provincial advertising of programs are unknown to London Hydro.

3.5 Evaluation

The Ontario Power Authority has retained a number of program evaluation contractors to assess the 2013 performance of each of the provincial CDM programs. The key evaluation findings included as Appendix D herein have been provided by the Ontario Power Authority to the community of LDCs. It is understood that the actual reports prepared by the various EM&V contractors will not be available until after September 30th, 2014.

3.6 Additional Comments

A number of challenges have arisen, all outside of London Hydro's control, which will certainly negatively affect London Hydro's ability to fulfill its obligations with respect to CDM performance. These matters are outlined below.

3.6.1 Challenges with the CDM Delivery Model

As noted in London Hydro's annual report of 2011 CDM activities and achievements,[25] there was emerging evidence of a fundamental flaw with the current CDM delivery framework. These early warning signs became more significant

[25] London Hydro Report EM-12-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.6.1, *Emerging Challenges with the CDM Delivery Model*; pg 44 -46.

throughout 2012 and it is now abundantly clear that the prevailing CDM delivery model doesn't work (just like classical organizational theory suggests).

The underlying structural problem with the CDM delivery framework is repeated below for convenience of reference.

From the perspective of organizational effectiveness (i.e. the ability to get things done), authority, responsibility, accountability and resources are inter-related.

- Authority is the right or power assigned to an executive or a manager in order to achieve certain organizational objectives.
- Responsibility is the duties assigned to a position or executive. The person accepting responsibility is accountable for the performance of assigned duties.
- Accountability is the answerability for performance of assigned duties to discharge the responsibility.

An effective organization will have these fundamental elements, as depicted in Figure 3-25 below, within the corporation's management framework. For example, in London Hydro's case, the CDM Department needs to be staffed with the appropriate resources to accept accountability and responsibility for fulfilling its CDM targets. Should issues arise involving other departments, the CEO who has a shared responsibility to meet the regulated CDM targets has the authority to remedy the matter in a timely fashion.

Figure 3-25, Optimal Organizational Relationships

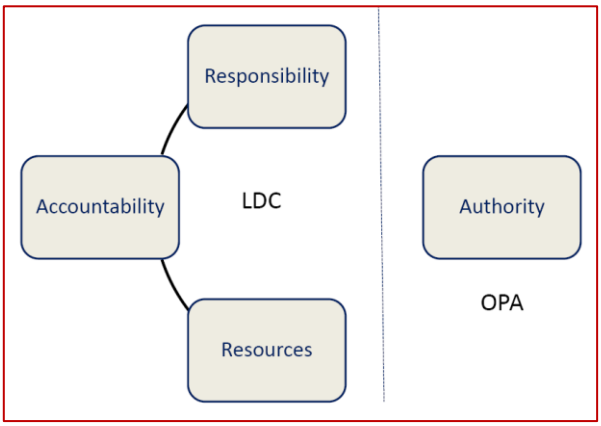


Figure 3-26, Present CDM Delivery Model

Unfortunately the CDM delivery model in effect is more aptly represented by Figure 3-26 above. The LDC has responsibility and accountability for applying sufficient resources to deliver CDM programs and meeting its respective CDM targets, but the LDC has no authority whatsoever to remedy significant shortcomings with the OPA-contracted province-wide CDM programs.

London Hydro has done all that it can to improve the CDM programs via active participation in the EDA's CDM Caucus, and the Industrial Working Group, the

Commercial Working Group, the Residential Working Group, and the Low-Income Working Group. These endeavors continue to this day.

3.6.2 The Non-Responsive Change Management Protocol

As noted in London Hydro's annual report of 2011 CDM activities and achievements,[26] London Hydro has enjoyed various successes in the CDM marketplace in recent years because the organization recognizes that energy conservation is primarily a "*sales*" activity (as opposed to a "*technical*" or "*legal*" undertaking). There are many facets to the sales activity, including but not limited to "*removing all barriers to customer participation*", "*promoting opportunities using language and concepts that the target customer understands*", "*cross-pollinating one program with another*", etc. Unfortunately, too many of the CDM programs developed by the Ontario Power Authority fail to appreciate and put effective sales concepts at the forefront of program design.

With any new endeavor that is launched to the marketplace, whether it is a new CDM program, a new corporate website, or a new service offering, no one really expects perfection "*out of the gate*". However, when an unexpected participation barrier is discovered, or an operational shortcoming is encountered, successful organizations are those that are very nimble and address such issues in a most expedient manner.

Unfortunately, the OPA's overly-legalistic approach to CDM program administration at the outset became the foundation for their change management process as depicted in Figure 3-27 below.[27]

[26] London Hydro Report EM-12-04, *Energy Conservation and Demand Management - Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.6.8, *Fundamental Sales Tactics – The Overlooked Element in Program Design*; pg 53 – 55.

[27] OPA webinar presentation of December 12, 2012, *Overview of V3 LDC/OPA Agreement*; Slide #3, *Review of the Change Management Process*.

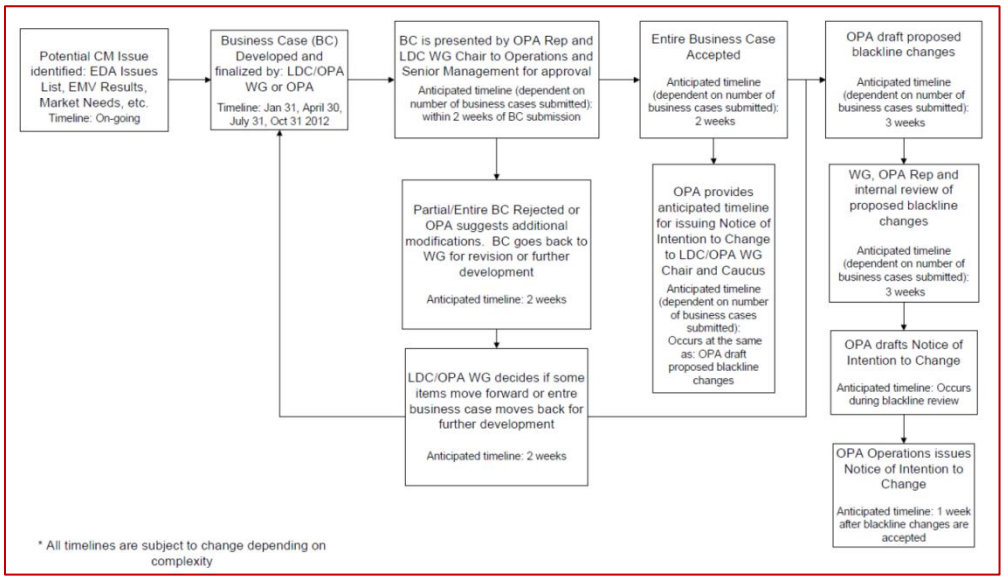


Figure 3-27, Flowchart for the OPA's Change Management Process

It will be seen from the flowchart that there are only four windows each year when business cases can be submitted, and the minimum elapsed time from submission of a business case to OPA issuing a *Notice of Intention to Change* is 10 weeks or greater.

The flowchart presents the most optimistic case and there will be several instances where needed program changes took more than a year to be implemented! This is hardly the hallmark of a "*nimble*" organization.

The non-responsive change management process is yet another in a continuum of examples of LDCs capability to achieve their full CDM potential being stymied by overly-bureaucratic and ill-conceived program administration requirements that add cost and delay, dissuade participation and provide no apparent benefit in terms of risk management.

3.6.3 PROCESS & SYSTEMS – Another Non-Robust Business Process

As was previously described in Section 3.2.2.7 (starting on page 23 herein), the saveONenergy PROCESS & SYSTEMS initiative provides funding for on-site full-time Embedded Energy Managers within eligible customer facilities. Such Embedded Energy Managers basically have a performance contract wherein they are required to achieve a defined minimum level of annual demand reduction and annual energy savings; however 30% of savings must be achieved without third party incentives.

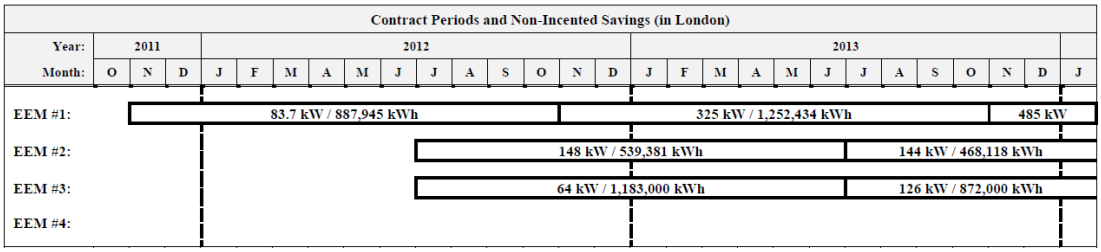
London Hydro engaged the first Embedded Energy Manager in the province. Being pioneers, London Hydro had to work with both the industrial customer and the Ontario Power Authority to establish a template for reporting the "*non-incented*" demand reductions and energy savings in a manner and format that would not be burdensome for the customer but yet would be valuable to the Ontario Power Authority. This endeavor was quite successful and resultant template was distributed

to the LDC community to be used as a reference document by all other Embedded Energy Managers throughout the province.[28]

However, it is abundantly clear that the manner in which the data is stored and manipulated within the Ontario Power Authority isn't robust. As was reported in London Hydro's annual report of 2012 CDM activities and achievements,[29] in spite of expending significant effort throughout 2012 to ensure that the quarterly reports issued by OPA were correct, the OPA's "*Final 2012 Report of Verified Results for London Hydro*" is completely divorced from reality. The situation has not improved in 2013 – London Hydro contends that the OPA's "*Final 2013 Report of Verified Results for London Hydro*" is also incorrect and again understates London Hydro's achievements.

London Hydro has three (3) Embedded Energy Managers, one whose facilities are entirely within London Hydro's franchise service territory, and the other two with facilities both within and external to London Hydro's service territory. The period of their respective Agreements and the non-incented energy savings / demand reductions that should have been attributable to London Hydro are depicted in Table 3-10 below.

Table 3-10, Non-Incented Savings for Embedded Energy Managers



Embedded Energy Managers are contracted on a one-year basis with renewal provisions provided there are more opportunities and the Embedded Energy Manager is meeting the defined performance metrics. Since, as depicted in Table 3-10 above, the contract durations for Embedded Energy Managers don't conveniently align with the calendar year, it becomes necessary to attribute non-incented savings that usually span two calendar years to a particular reporting year. For example, in Table 3-10 above, the initial contract for EEM #1 was in effect from November 4, 2011 to November 3, 2012, after which it was renewed for another year. For reporting 2012 non-incented savings, therefore, one would have to extract the actual 2012 achievements that occurred during the lifetime of the first agreement and the actual 2012 achievements that occurred during the lifetime of the renewed or second agreement.

[28] Refer to OPA's E-Blast of February 22, 2013 announcing a webinar on February 27th entitled: *saveONenergy Update Webinar: Spillover – Documenting Non-Incentivized Savings*.

[29] London Hydro Report EM-13-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2012 Activities and Achievements*; September 2013; Section 3.6.4, *PROCESS & SYSTEMS – Another Non-Robust Business Process*; pg 53 – 55.

With respect to the OPA's "*Final 2013 Report of Verified Results for London Hydro*" the following issues / problems are readily observed:

- The reported annual gross peak demand reductions (with adjustments) and reported annual gross energy savings (with adjustments) are different than London Hydro's records (which are simply comprised of data directly extracted from each Embedded Energy Manager's quarterly report).
- The reported annual net peak demand reductions (with adjustments) and reported annual net energy savings (with adjustments) should be mathematically derived from the reported gross demand reductions and gross demand savings using the reported realization rates and net-to-gross ratios. However this is not the case in the "*Final 2013 Report of Verified Results for London Hydro*"
- The reported realization rate for London Hydro's Embedded Energy Managers for 2012 is an extremely low 46% even though the report notes that the "… *program enabled savings were not independently verified*". By contrast the reported 2012 provincial realization rate for Embedded Energy Managers is 116%. London Hydro has been questioning the OPA for more than a year (without success) to provide a rational explanation for this 46% realization rate.[30] [31] Considering the reported unincented savings for 2012 bore so little resemblance to reality, one would have to question what information was actually used to derive this extremely low realization rate.

Note: The aforementioned problems were reported to the OPA when the "*draft*" edition of the 2013 verified results was distributed to LDC's, but as in previous years, the OPA has totally failed at remedying its own reporting problem.

From London Hydro's perspective, the OPA's erratic reporting of "*non-incented*" demand reductions and energy savings for London Hydro's Embedded Energy Managers suggests a serious robustness problem with the OPA's data systems that is especially disconcerting since achievement of CDM targets is a condition of each LDC's license.

3.6.4 Demand Response – The Outcome of a Significant Landscape Change

In London Hydro's annual report of 2011 CDM activities and achievements, it was noted that once south-western Ontario was declared a "*discount zone*" for demand response, interest by both customers and demand response aggregators dried up.[32] This situation has been further aggravated by the elimination of the "*Option B (200 h)*" participation option in January 2013.[33]

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[30] E-mail dated September 25, 2013 to Phil Bosco (OPA) from Gary Rains (London Hydro); re: *Looking for EM&V Reports....*

[31] E-mail of September 3, 2014 to LDC Support from Gary Rains (London Hydro); re: *Embedded Energy Managers - Realization Rates & NTG Ratios...*

[32] London Hydro Report EM-12-04, *Energy Conservation and Demand Management – Annual Report of London Hydro's 2011 Activities and Achievements*; September 2012; Section 3.6.4, *Declaration of Discount Zone for Demand Response*; pages 48 – 50.

[33] Refer to saveONenergy E-BLAST: January 25, 2013; re: *Demand Response aggregators update*.

As can be seen in Figure 3-28 below that participation (as depicted by the blue line) initially increased at an acceptable rate until September 2011 after which participation interest abruptly stalled. The average contracted demand response capacity will be seen to be about 230 kW per participant (i.e. 2.59 MW for 11 participants in July and August, 2013).

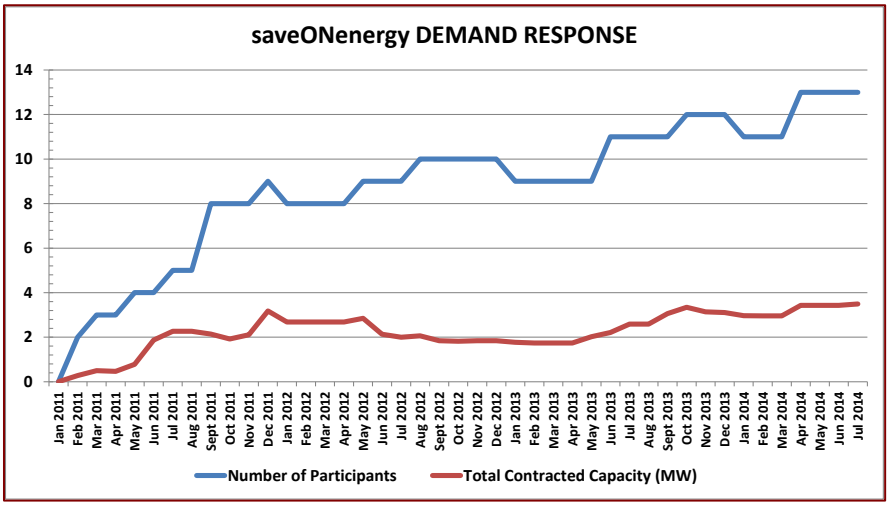

Figure 3-28, DEMAND RESPONSE Activity in London

Up until the Fall of 2011 several demand response aggregators seemed to be actively pursuing customers in the London area and there were frequent meetings with London Hydro. Nowadays communications with the aggregators are very infrequent and framed more as courtesy calls than to discuss a potential customer. The marketplace is sending a very clear signal that there aren't sufficient incentive monies to attract customer interest, there isn't a sufficient revenue opportunity for aggregators to justify the expended effort for little or no uptake, or both.

Note: It will be recalled from Section 3.2.2.1 herein that, with respect to the saveONenergy DEMAND RESPONSE program, the three (3) demand response aggregators authorized by Ontario Power Authority have primary responsibility for qualifying and enrolling customers; an LDC's role is limited to providing support to the Aggregators.

Electricity distributors (such as London Hydro) are not privy to the contractual arrangement between participants in the saveONenergy DEMAND RESPONSE program and the authorized demand response aggregators. As such, no explanation can be offered as to the underlying reason that the number of participants has increased slowly since the Fall of 2011 and yet the contracted demand response capacity remains in the 2 to 3 MW range.

A Ministry of Energy directive issued March 31st, 2014[34] effectively eradicates any prospect of attracting additional demand response participants or capacity within London Hydro's franchise service territory. This directive transfers demand response

[34] Directive dated March 31, 2014 to Ontario Power Authority from Ministry of Energy; re: *Continuance of the OPA's Demand Response Program Under IESO Management*. Electronic version available on OPA website at URL:: http://www.powerauthority.on.ca/sites/default/files/news/MC-2014-853.pdf

programs to the IESO, and precludes the OPA from entering into new demand response contracts.

3.6.5 The Behind-the-Meter Load-Displacement Generation Debacle

Many food processing and other industrial consumers have significant thermal requirements, whether it be in the form of steam energy systems, or natural gas-fired boilers associated with pasteurizing beer, separating corn and other grains into its component parts to create a myriad of value-added products. Other industrial customers create substantial quantities of waste heat.

The Association of Major Power Consumers in Ontario (AMPCO) frequently makes the claim that: *Industrial customers in Ontario pay the highest cost of delivered power among all the manufacturing jurisdictions in Canada and the United States*.[35] Certainly one method by which some manufacturing sector customers can improve their energy efficiency (and hence their overall competitiveness) is via in-plant cogeneration systems (to produce both thermal and electrical power from their natural gas consumption) and waste heat generation systems (that convert low grade waste heat into electrical energy). Such an approach would certainly also be embraced by the Environmental Commissioner of Ontario.[36]

Item 6(h) of the Minister of Energy & Infrastructure's directive of March 31st, 2010 to the Ontario Energy Board recognized a variety of load reduction techniques as contributing towards an LDC's targets. The specific exclusion is generation projects that are associated with the Ontario Power Authority's Feed-In Tariff (FIT) program for renewable energy.[37]

For LDC's with customers that wished to pursue load displacement generation projects, the unfortunate story that follows is one of LDC's stymied by OPA indecision and inaction and consequently customers left in the dark regarding the status of their proposed generation project. Specifically:

- Schedule E, *Eligibility Criteria*, within Exhibits A, B, and C of Schedule D-1 to the Master CDM Program Agreement, *Process and System Upgrades Initiatives 2011 – 2014*, stipulates that fuel-switching projects and generation projects must be approved in writing by the LDC, but no guidance is provided to the LDC concerning acceptance parameters (e.g. if an LDC could technically interconnect a 30 MW cogeneration system to its distribution system, would this be an eligible project?).

[35] Source: AMPCO's Response to IESO Consultation SE-106 Considering Second Draft Report by Navigant Consulting.

[36] Environmental Commissioner of Ontario annual report: *A Question of Commitment: Review of the Ontario Government's Climate Change Action Plan Results*; December 2012; pg 76.

[37] Minister of Energy & Infrastructure directive of March 31, 2010 posted electronically on Ontario Power Authority website at URL: http://www.powerauthority.on.ca/sites/default/files/page/17069_minister_directive_20100423.pdf

- In February 2012, the Ontario Power Authority released policy guidelines for the acceptance of load displacement generation projects under the saveONenergy PROCESS & SYSTEMS initiative.[38] Because there is a limited budget available for capital incentives in the PROCESS & SYSTEMS initiative and these projects are expected to be very large and capital intensive, the OPA intended to limit the amount of generation accepted to 25 MW.

- In July 2012, the Chair of the Electricity Distributors Association's *Industrial CDM Working Group* wrote to the OPA seeking clarification on a number of items related to load-displacement generation applications.[39] It was the general understanding that the applications for natural gas-fired load displacement generation projects (representing 27 MW of capacity) remained in an indeterminate state within the OPA, i.e. they weren't being released to the OPA's designated Technical Reviewer for processing. It was suggested that, perhaps on a go-forward basis, industrial consumers and LDC's could be advised that no further applications for load displacement generation projects would be accepted (due to the reported surplus base-load generation issue in the province) but those applications already in the queue should be processed.

- Again, as is quite typical, no response was received from the OPA. This situation simply strained relationships between certain customers and their LDC's – the customers were reasonably expecting status updates concerning their load displacement generation project. Unfortunately there was nothing that the LDC could say due to a complete information vacuum from the OPA.

- In November 2012, OPA officials advised attendees of an OPA Management Teleconference that the agency has put a pause on natural gas-fired combined heat & power (CHP) projects in order to consider their impact on conservation and the saveONenergy PROCESS & SYSTEMS program.[40]

- Finally, in July 2013 (i.e. a full year later, and 2½ years into a 4 year program), the OPA electronically notified the LDC community[41] that:

  All pending and future applications for customer-based generation natural gas projects under PSUI will be subject to the following terms:

  - *OPA will consider the project's value to the electrical system, at a provincial and/or regional level*
  - ***:***

[38] Attachment to OPA E-Blast of February 8, 2012; *OPA Policy Guidelines for Acceptance of Generation Projects under PSUI*.

[39] Letter of July 6, 2012 to Andrew Pride (OPA's Vice President – Conservation) from Jerry Van Ooteghem (Chair, Industrial Working Group).

[40] Environmental Commissioner of Ontario report: *Restoring balance – Results; Annual Energy Conservation Progress Report – 2011 (Volume Two)*; January 2013; Section 3.1.4.1, *Cogeneration Funding Through Conservation Programs*; pg 32.

[41] Ontario Power Authority E-Blast dated July 11, 2013

- By this time, London Hydro had three (3) customers pursuing behind-the-meter load displacement generation projects. London Hydro certainly did not want any of its customers to expend more internal resources and consulting dollars developing a proposal for a behind-the-meter load displacement generation project and then going through the charade of submitting a saveONenergy PROCESS & SYSTEMS application if it is known at the outset that there is no reasonable prospect of achieving OPA approval for the proposed project. As such the following question was posed to OPA:[42]

  > *Can you provide a simple "Yes" or "No" answer to the following question?*
  >
  > > *Is there anywhere within London Hydro's franchise service territory (or even within south-western Ontario) where behind-the-meter natural gas-fired generation would be deemed by OPA to provide value to the interconnected provincial electricity system?*

  As is typical, there was no response to this letter or to a reminder e-mail sent more than a month later.

- Finally London Hydro appealed to the CEO of OPA to intervene and petition an answer to this fundamental question.[43] Almost a month later, London Hydro received an evasive reply[44] to the effect that the determination couldn't be made without a Detailed Engineering Study, for which one of London Hydro's industrial customers had already received funding authorization up to the $50K threshold to prepare such a study. London Hydro fails to see how a detailed engineering study (which is an assessment of in-plant processes) will provide insight into transmission system planning matters, but nonetheless authorized the study to proceed, effectively stalling a definitive answer until sometime in 2014.

In spite of the vague proviso, there is considerable administrative and engineering time and effort (by the customer, the customer's consultant and contractors, the LDC, the ESA, and the provincial transmitter) associated with the interconnection of a generator to electricity distribution system (pursuant to Appendix F, *Process and Technical Requirements for Connecting Embedded Generation Facilities*, of Ontario Energy Board publication *Distribution System Code*). Specifically:

- It is firstly necessary to carry out a Connection Impact Assessment (CIA) to ensure that the additional generation won't (a) cause short-circuit conditions beyond the short-circuit withstand and interrupting ratings of the protective equipment used on the distribution system or within the supply transformer station, and (b) won't give rise to system stability issues on the provincial transmission grid.

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[42] Letter of July 15, 2013 to Sean Brady from Gary Rains, re: *saveONenergy PROCESS & SYSTEMS; Behind-the-Meter Natural Gas-fired Generation*.

[43] E-mail of September 19, 2013 to Colin Andersen (CEO of OPA) from Gary Rains (London Hydro); re: *Behind-the-meter load displacement generation...*

[44] E-mail, dated October 10, 2013 to Gary Rains (London Hydro) from Sean Brady (OPA); re: *Behind-the-meter load displacement generation...*

- Pending a favourable outcome of the CIA phase, the parties usually then turn their attention to a number of interconnection design matters, e.g. often necessary revisions to the customer's revenue metering system, revisions to the protective relays in the supply transformer station, the design of a teleprotection system, the provision of SCADA equipment, and the development of generator commissioning plan and Operating Agreements.

Only with the CIA completed and much of the design phase completed, can the customer proceed with procurement, installation and commissioning of their generation facilities which usually include many long lead-time elements.

From a practical perspective, given that the OPA has effectively stalled the processing of behind-the-meter load-displacement generation until early 2014 (and perhaps even later), and the timeframe for these types of projects is lengthy, it is highly inconceivable that any generation projects can be interconnected with the distribution grid by the December 2014 deadline for inclusion as a contributor towards an LDC's CDM targets.

3.6.6 The Meter Lending Library – A Failure to Launch

For some energy-efficiency projects, such as lighting upgrades, the associated demand reduction and energy savings are quite straightforward to mathematically quantify. For example, the replacement of a 60 W incandescent bulb with a 15 W CFL results in a demand reduction of (60 W – 15 W =) 45 W. The resultant energy savings would depend only upon the typical duty cycle (i.e. the ON time) of the lighting fixture. For example, if the fixture was ON for 4,000 hours throughout the year, then the energy savings would be (45 W x 4,000 h =) 180,000 Wh or 180 kWh per annum.

For more complex electrical apparatus, such as HVAC and process cooling systems, public elevators, booster pumps, compressed air systems, and manufacturing process (e.g. plastic extrusion machines, bottling lines, conveyor and packaging systems, etc.), the approach is more complex. While mathematical models are still used, one will generally want to install one or more recording-style instruments to measure electrical power consumption patterns and perhaps other relevant parameters such as temperatures, flow rates, etc. With such "*baseline*" data, one can "*calibrate*" the mathematical model (i.e. verify that the electrical consumption pattern predicted by the mathematical model is consistent with the "*observed*" electrical consumption patterns as measured by one or more portable recording-style power measurement instruments), and then use this insight to develop the value proposition (i.e. predicted energy savings, demand reduction, and consequent recurring operating cost reduction associated with the implementation of one or more energy-efficiency measures).

Following installation of the energy-efficiency measures, it is common practice to re-install the recording-style instruments to verify both that (a) the energy-efficiency measure was commissioned properly, and (b) that the energy-efficiency measure is delivering the promised demand reduction and energy savings to the customer.

As such, if one wants to progress beyond the "*low-hanging fruit*" of lighting upgrades into deeper energy savings associated with energy-efficiency improvements to complex processes and systems, then portable recording-style power measurement instruments are a very important tool.

Figure 3-29, Candura Recording-Style Portable Power Measurement Instrument

To this end, the OPA's Technical Reviewer (under contract to the OPA) was to create and operate a central province-wide metering and instrumentation library wherein LDC's and their customers would have access to a range of instrumentation to more accurately characterize the energy use of fans, pumps, compressors, processes, etc.[45]

Although twenty-three (23) Candura portable recording-style power measurement instruments (as depicted in Figure 3-29 above) were procured and the "*Meter Lending Library*" was promoted on the OPA's website, it is understood that the OPA's legal staff ascertained that some insurmountable liability risk was associated with loaning instrumentation to the LDC community, and the program was never launched.

London Hydro didn't share that particular viewpoint and in May 2012 London Hydro offered to both purchase the entire inventory to Candura power measurement instruments and to operate a lending library for the benefit of the LDC community throughout southwestern Ontario.[46]

While London Hydro already possessed several Dranetz type *Power Platform® 4300* handheld, multi-function power analyzers and a number of AEMC Instruments' clamp-on current logging probes, its specific emphasis on manufacturing-sector customers created an unfortunate situation whereby there wasn't nearly enough instrumentation to fulfill the emerging need. Further appeals were made to the OPA to procure the surplus Candura power measurement instruments.[47] [48]

[45] Ontario Power Authority document: *2011 – 2014 OPA-Contracted Province-Wide CDM Program; Industrial Program Summary Guide*: October 2010. Document available in electronic format on OPA website at URL:: http://icon.powerauthority.on.ca/report/templates/2011-2014%20Industrial%20Program%20Guide.pdf

[46] Letter of May 24, 2012 to Andrew Pride (Vice President – Conservation) from Gary Rains, re: *saveONenergy PROCESS & SYSTEMS Initiative; Meter Lending Library – Procurement of Surplus Equipment*.

[47] E-mail of September 24, 2012 to Andrew Pride from Gary Rains; re: *Meter Lending Library ….*

[48] E-mail of May 24, 2013 to Andrew Pride from Gary Rains; re: *Ongoing OPA Ineffectiveness - Meter Lending Library - Procurement of Surplus Equipment….*

Finally in August 2013 – more than 14 months after the initial offer – London Hydro finally was able to purchase the inventory of surplus Candura power measurement instruments. In hindsight, trying to do the right thing for the ratepayers of Ontario very much restricted the inroads London Hydro was endeavoring to achieve with its manufacturing sector customers.

The foregoing simply chronicles yet another instance of the conservation division of the Ontario Power Authority as an ineffective and dysfunctional organization that, in spite of its mandate, is continuously hampering excellence on the CDM front in this province.

Shortly after delivery of the instruments, London Hydro arranged for a two (2) part customized training session consisting of:

- Arc flash hazard and electrical safe work practices refresher training, by Infrastructure Health & Safety Association; and
- Instrument user training, by Candura.

This training was provided to London Hydro staff and offered to other LDC's throughout southwestern Ontario that might wish to borrow the Candura power measurement instruments.

London Hydro has operated the instrument lending library since the Fall of 2013. As evidence of the popularity of this service, all of the instruments have been in constant circulation since that time and there have been instances where demand exceeds supply, i.e. requesting LDC's have to wait for an instrument to become available.

3.6.7 Compressed Air Worksheets – Another (Non-Comedic) Farce

Many manufacturing sector customers have extensive in-plant compressed air systems that are expensive to operate and for which there are generally an abundance of energy-efficiency and optimization opportunities. However, in the first year that the saveONenergy RETROFIT PROGRAM was available, uptake by manufacturing sector customers was virtually non-existent. Feedback from several compressed air system suppliers suggested that the underlying problem was with the engineered worksheets for compressed air systems, namely the measures included on the engineered worksheets weren't reflective of the measures being promoted to manufacturing-sector customers.

Note: While participants could have elected the "*custom*" track within the saveONenergy RETROFIT PROGRAM, it is more difficult and the marketplace is sending a very clear message that this option is not worth the perceived effort.

To address this shortcoming, London Hydro and Toronto Hydro jointly contracted LeapFrog Energy Technologies Inc. to expand the energy-efficiency measures on the engineered worksheet (e.g. VFD's on trim compressors, and various air dryer technologies). The software was calibrated using data from a number of Toronto Hydro projects. The software and associated comprehensive *User Guide* were delivered to the OPA in October 2012.

After months of no updates, an OPA representative in attendance at a meeting of the joint OPA/EDA Industrial CDM Working Group announced that the OPA had concerns with the sequencing control in multiple-compressor systems – there can be situations where the sequencing control isn't properly configured and consequently the system can use more energy. London Hydro didn't concur that this was a valid concern – incorrect sequencing would certainly be something that is detected as part of the post-project M&V process. Rather that incur further delays, it was agreed that the sequencing control would be blocked – thereby giving OPA more time to study this feature – but the engineered worksheet would be issued as soon as possible with the other energy-efficiency measures. The OPA would deal directly with LeapFrog Energy Technologies Inc. to block the compressor sequencing control option in the revised engineered worksheet.

After the project left Toronto Hydro / London Hydro's hands, the inaction by the OPA is chronicled below:

- In a May 8th, 2013 status update inquiry to LeapFrog Energy Technologies Inc, it was learned that Leapfrog had submitted a proposal to OPA on January 29th and was still awaiting a purchase order from OPA.
- On May 9th, London Hydro issued an e-mail to the OPA and membership of the Industrial CDM Working Group offering to issue Leapfrog a purchase order immediately – all that was needed is a definition of the scope of work.
- On May 30th, LeapFrog Energy Technologies Inc. indicated that the purchase order from OPA was finally received and work could start.
- As of September 2013 (i.e. a year later!!), neither the Industrial CDM Working Group nor the LDC community have received any update whatsoever as to the status of the improved engineered worksheet for compressed air systems.
- The Version 5 change notice that was issued on August 27th, 2014[49] finally included the Compressed Air Engineering Worksheet – almost two years after the product was delivered to OPA.

Unfortunately, the foregoing is simply yet another sad example of the Ontario Power Authority as a dysfunctional and ineffective agency.

3.6.8 Peaksaver PLUS In-Home Displays – Much Ado About Nothing

London Hydro has encountered challenges with the requisite in-home display component of the peaksaver PLUS program, as previously outlined in Section 3.2.1.3 (starting on page 16 herein). Nonetheless, in the summer of 2014 as part of London Hydro's pilot project with the Green Button *Connect My Data* initiative, London Hydro arranged for participants with Energate WiFi-enabled thermostats to also participate in the peaksaver PLUS initiative.

[49] E-mail dated August 27th, 2014 to LDC Conservation Officers from the OPA's Conservation Contracts; re: *Change Notice For New & Amended Worksheets*.

Interestingly (and as noted in Appendix D herein), the OPA's independent EM&V exercise has shown "*no statistically significant energy savings*" associated with an in-home display. This finding mirrors emerging results from other jurisdictions.[50]

Although there is much hype in the industry about Home Energy Management Systems (HEMS), the LDC industry certainly needs to heed the lessons of history and proceed with caution. Smart meters in conjunction with time-of-use electricity pricing hasn't produced the desired outcome, in-home displays haven't produced the desired outcome, and HEMS may just be the next device that also proves to be ineffective at measurably influencing customer behavior.

[50] ICF Marbek report: *Achievable Potential – Estimated Range of Electricity Savings Through Future Ontario Conservation Programs – Residential Sector*; March 26, 2014; pg 88.

4 COMBINED CDM REPORTING ELEMENTS

4.1 Progress Towards CDM Targets

4.1.1 London Hydro's CDM Achievements in 2012

As will be recalled from Section 1.1 herein, LDC's have two (2) distinct CDM targets, namely a "*2014 net peak demand savings*" target and a "*2011 – 2014 net cumulative energy savings*" target.

Table 4-1 below indicates London Hydro's 2013 progress towards its demand savings target.

Table 4-1, Net Peak Demand Savings at End-User Level (MW)

Implementation Period	Annual Peak Demand Savings (MW)			
	2011	2012	2013	2014
2011 - Verified	6.7	4.1	4.1	4.0
2012 - Verified		4.7	3.1	3.1
2013		0.2 ✪	5.9	3.1
2014				
Verified Net Annual Peak Demand Savings in 2014 (MW):				10.2
London Hydro's 2014 Annual CDM Capacity Target (MW):				41.4
Verified Portion of Peak Demand Savings Target Achieved (%):				24.6%

✪ - Adjustments for under-reporting in previous years.

There are two (2) distinct methods for achieving the peak demand reduction targets, namely (i) energy efficiency, which achieves both energy savings and a demand reduction, and (ii) demand response, which affects the peak load during a DR activation. These concepts are illustrated in Figure 4-1and Figure 4-2 below:[51]

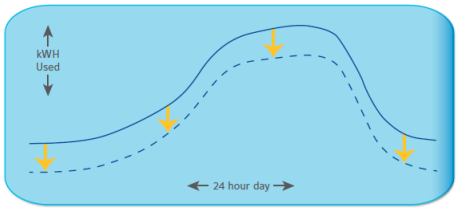

Figure 4-1, Effect of Energy-Efficiency

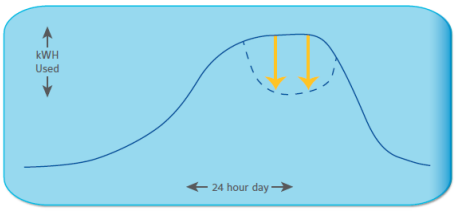

Figure 4-2, Effect of Demand Response

It can be implied from Table 4-1:

[51] Johnson Controls publication: *Energy Efficiency and Demand Response: Working Together in an Integrated Approach to Managing Energy*; Kelly Smith and Katrina Managan, Johnson Controls; February 2012; pg 3.

- London Hydro's net peak demand savings for 2013 is a combination of 10.19 MW of net demand reduction achieved from energy-efficiency projects and 2.45 MW from customer participation in the demand response marketplace.
- Where peak demand reduction is achieved by customer participation in one of the demand response programs, LDC's only receive credit for one-year measure persistence (i.e. the credit is assigned for 2013 only). If the customer's contractual arrangements with the demand response aggregator extends past December 31st, 2014, London Hydro's true attribution would be 31.1% (as opposed to the 24.6% shown in the above tabulation).
- With respect to the first line (labeled "2011 – Verified") the slight drop-off to 4.02 MW in 2014 from the 4.05 MW of net demand reduction in 2012 and 2013 is likely attributable to some of the implemented energy-efficiency measures having a persistence of only 3 years (meaning that they contribute in 2011, 2012 and 2013, but are considered at the end of their useful life by 2014).

London Hydro's submitted CDM strategy [Ref 3 & 4] didn't provide a year-by-year breakdown of expected net peak demand reductions. If equal achievements in each of the four years is assumed, then the annual target would be (41.44 MW / 4 years =) 10.36 MW. With a 2013 achievement of (3.295 + 2.452 + 180 adjustment =) 5.927 MW of peak demand reduction, then London Hydro has only achieved 54% of this peak demand reduction objective.

Table 4-2 below indicates London Hydro's 2013 progress towards its energy savings target.

Table 4-2, Net Energy Savings at the End-User Level (GWh)

Implementation Period	Annual Energy Savings (GWh)				Cumulative Savings (GWh)
	2011	2012	2013	2014	
2011 - Verified	21.1	21.0	21.0	20.9	84.0
2012 - Verified	0.3 ✪	14.4	14.1	13.9	42.7
2013		1.5 ✪	15.8	13.4	30.7
2014					
Verified Net Cumulative Energy Savings, 2011 – 2014 (GWh):					157.4
London Hydro's 2011 – 2014 Cumulative CDM Energy Target (GWh):					156.6
Verified Portion of Cumulative Energy Target Achieved (%):					100.5%

✪ - Adjustments for under-reporting in previous years.

Again, London Hydro's submitted CDM strategy [Ref 3 & 4] didn't provide a year-by-year breakdown of expected net accumulated energy savings. Nonetheless, if one assumes that London Hydro would have pursued a balanced approach (i.e. equal energy savings in each of the four years), then the expectations for 2013 would have been 15.664 GWh, resulting in a 2011 – 2014 accumulated net energy savings of (2 x

15.664 GWh =) 31.328 GWh. With a verified net cumulative energy savings of 30.7 GWh, then London Hydro can be said to have achieved 98% of its 2013 performance objective.

Note: With proper attribution of the energy savings achieved by the Embedded Energy Managers – refer to Section 3.6.3 herein – the performance target will have been achieved.

4.1.2 Comparison of London Hydro's CDM Achievements to Other LDC's

Figure 4-3 shows London Hydro's *2013 net demand reduction* achievements in comparison to the achievements of all other LDC's throughout the province. Although London Hydro's 2013 achievement with respect to peak demand reduction is less than the organization's internal target, the chart indicates that meeting the demand reduction targets may be a provincial challenge.

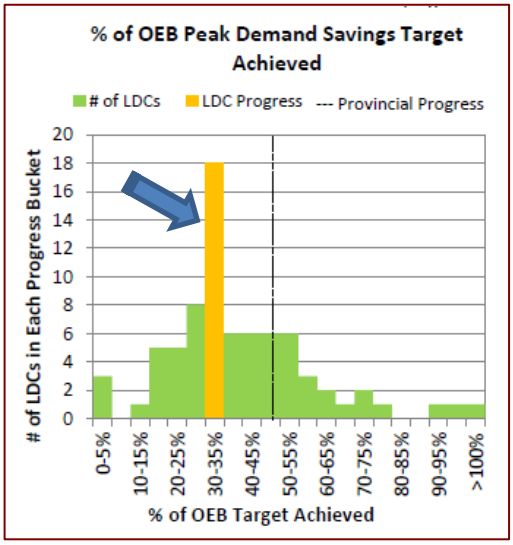

Figure 4-3, London Hydro's 2013 Demand Reduction Achievements

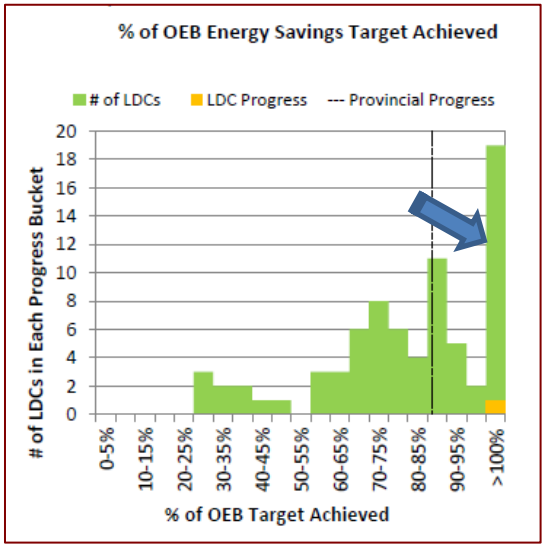

Figure 4-4, London Hydro's 2013 Energy Savings Achievements

Figure 4-4 shows London Hydro's *2013 net energy savings* achievements in comparison to the achievements of all other LDC's throughout the province. It is clear from the graph that London Hydro has exceeded its 2011 – 2014 net accumulated energy savings target in 3 years – 1 year ahead of schedule.

4.1.3 Discussion of London Hydro's 2013 CDM Achievements

London Hydro's CDM Strategy [Ref 3 & 4] was predicated on the expectation that the Ontario Power Authority's provincial CDM programs wouldn't be plagued with participation barriers (most of which were earlier outlined in Section 3.6 herein). Reality was quite different than expectations.

The OPA's change management process, as illustrated in Figure 3-27 (on page 48 herein), was so elongated and cumbersome that virtually none of the needed program changes came into effect in 2012. In fact the outlook certainly for the first half of 2013 won't be much better.

4.2 CDM Strategy Modifications

No modifications to London Hydro's CDM delivery strategy are contemplated. The net accumulated energy savings target has been met one year ahead of schedule. The net peak demand reduction target remains elusive, not only for London Hydro, but many other LDCs in the province on account of:

- In the Fall of 2011, southwestern Ontario was declared a discount zone for demand response programs. It can be seen from Figure 3-28 (on page 51 herein) that customer interest in participating in demand response programs immediately evaporated;
- A Ministry of Energy directive issued March 31st, 2014 (re: *Continuance of the OPA's Demand Response Program Under IESO Management*) effectively ends any prospect of attracting additional demand response participants or capacity within London Hydro's service territory.
- The prospect of getting any embedded load-displacement generators into service before December 2014 is now zero – refer to the discussion in Section 3.6.5 (starting on page 52 herein).

5 CONCLUSIONS

Over the course of 2013, London Hydro has achieved another 5.9 MW in net peak demand reduction and 30.7 GWh in net energy savings, which together with its 2011 and 2012 achievements represents 31.1% and 100.5% respectively of London Hydro's 2014 target. These verified 2013 results have been somewhat understated because:

- The understated non-incented energy-efficiency projects carried out by the three (3) Embedded Energy Managers, as described in Section 3.6.3 (starting on page 48 herein).

Whilst these results are representative of a considerable effort expended by London Hydro in cooperation with other LDC's, customers, channel partners, and active participation in the EDA's three CDM working groups, the unfortunate reality is that the LDC community could do much better but is significantly hampered in its endeavors by the combination of:

- A CDM delivery framework that can't and doesn't work effectively for reasons as described in Section 3.6.1 (starting on page 45 herein); and
- A provincial agency at the helm that is best described as "*ineffective and dysfunctional*". There is an abundance of examples throughout this report to support this conclusion.

Not surprisingly perhaps is London Hydro's judgment that none of the provincial CDM programs would be considered "*best of breed*" by peer utilities and agencies throughout North America.

The Canadian Manufacturers & Exporters (CME) and the Association of Major Power Consumers in Ontario (AMPCO) often remind us of the importance of the manufacturing sector both to the economic health of the province and in providing high-value, high-paying jobs. And it is this very sector that has been left behind with respect to participation in energy-efficiency programs. Specifically:

- saveONenergy PROCESS & SYSTEMS has been an abysmal failure – at the end of three years, a mere 294 kW attributable to incented energy-efficiency projects has occurred throughout the entire province;
- this sector can't make any headway with behind-the-meter load displacement generation projects (refer to Section 3.6.5 herein) or with heat recovery generation projects, both of which would improve their plant's overall energy efficiency (and hence their competitiveness in the marketplace in which they compete);
- due to southwestern Ontario being considered a "*discount zone*" for the DR3 emergency demand response program, the diminished financial reward for participating in DR3 no longer attracts customer interest; and

- this sector has a considerable number of expensive in-plant compressed air systems, but to date it has not been possible to get an engineered worksheet issued that meets their needs (refer to Section 3.6.7 herein).

Not only does the manufacturing sector deserve better, but all consumers deserve better especially if the end goal is to develop a "*culture of conservation*" in this province.

Looking ahead, London Hydro has already met and will certainly surpass its regulated accumulated net energy savings target.

However, as noted in Section 3.6.4 (starting on page 50 herein), the emergency demand response landscape has changed since the inception of the 2011 – 2014 CDM programs and London Hydro (along with many other LDC's) expects a shortfall in its regulated net demand reduction target.

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Appendix A, Promotional Materials for saveONenergy FRIDGE & FREEZER PICKUP

The saveONenergy FRIDGE & FREEZER PICKUP initiative is promoted within the City of London publication entitled *Waste Reduction & Conservation Calendar*, which is distributed to all households in the city.

Selected excerpts from the *Waste Reduction & Conservation Calendar* are included below:

London Hydro also promotes the saveONenergy FRIDGE & FREEZER PICKUP program via messaging printed on the outer reverse side of the monthly billing envelope received by residential customers.

Appendix B, Local Promotion of CDM Successes

The CO-OPERATIVE HOUSING FEDERATION of Canada

Co-ops benefiting from energy retrofit grants

By Marni Norwich

The Home Assistance Program (HAP) funded by the Ontario Power Authority is providing free energy upgrades for income-eligible co-op housing households throughout Ontario.

HAP is operated in each municipality by the local electricity distribution company (LDC). London Hydro has provided seven London-area housing co-ops with free energy upgrades since September.

"We started with co-op housing because we had a good relationship with them and they were keen to participate," says **Lisa Charteris**, a program co-ordinator for London Hydro. "The early adopters really helped us get our program off the ground and working for which we are grateful."

HAP comes from the Green Energy Act which mandates that all LDCs in Ontario reduce demand off the grid across their customer base. HAP and the Retrofit programs are available throughout Ontario.

Suzanne Wright, Senior Program Manager for McCormick and Zock, manages 16 properties in Southwestern Ontario, half of them co-ops. She says HAP provided energy-efficient light bulbs for four of the co-ops she manages and replaced older fridges, freezers, air conditioners and dehumidifiers with new Energy Star appliances for those who qualified. Wright estimates that members are saving 10 percent on their Hydro bills, and the co-ops have saved tens of thousands of dollars in new fridges.

"This is a priceless opportunity for co-ops to save money and support environmental initiatives," says **Denise McGahan**, Program Manager, Member Services, for CHF Canada's Southwestern Ontario office. "The program does have income eligibility requirements, but they are high enough that all of the members at one co-op qualified, even those paying market housing charges. So we urge all co-ops to apply!"

Charteris says that the key to maximizing incentives is to talk to the local LDC conservation officer and get some advice as to what would work best. London Hydro tries to provide program options and guidance to each co-op.

Some co-ops have chosen the HAP route and several are performing complete facility upgrades which offer even deeper energy use reductions.

Above: *Suzanne Wright, senior program manager for McCormick and Zock, has helped clients such as The Oaklands Housing Co-operative participate in the Home Assistance Program (HAP).*

Right: *London Hydro's Lisa Charteris works with Wright on the paperwork to secure HAP funding for one of the co-ops Suzanne manages.*

Appendix B.2, Local Promotion of CDM Successes

Nomination for MSEC Energy Saver Recognition

January 2014

London's City Centre Stands Proud of Energy Savings:

London City Centre's TD towers are two of Ontario's tallest office buildings outside of Toronto, but when it comes to energy conservation, this high-rise complex stands head and shoulders above even the loftiest commercial building like it in Canada. City Centre recently completed energy upgrades with the assistance of London Hydro's saveONenergy RETROFIT PROGRAM resulting in impressive savings and helped the commercial centre earn prestigious environmental certifications over the past year.

The RETROFIT program, operated out of London Hydro's Conservation and Demand Management Department, is an incentive program offered by the Ontario Power Authority. The program provides financial incentives to organizations to support projects that replace outdated, inefficient equipment with energy-efficient technology that reduces electrical consumption.

Because of a wide range of environmentally-focused initiatives highlighted by its energy saving projects, City Centre is now ISO 14001 certified. This certification sets out the criteria for an effective environmental management system. City Centre is the only high-rise commercial office tower in the country to attain ISO 14001. The two office towers were also designated as BOMA BESt Level 2. This is the Canadian industry standard for commercial building sustainability certification. City Centre's Dundee Realty Management is also finished with the preliminary stages of the LEED silver criteria and expects full certification this year. This is the most recognized green building rating system in North America.

The Projects:

City Centre has completed multiple projects in previous years that have encompassed an impressive array of energy efficiencies. Specifically, one major project in 2012 included the re-lamping of every floor gaining an incentive of over $60,000. As part of this efficiency the maintenance process was altered. Cleaning staff now work in a team, moving together from floor to floor each night and turning lights off as they go. That same year, variable speed drives were placed on the air control handling systems and the building automations system was upgraded to perform energy-saving tasks like lowering the heat in off-hours.

As an ongoing joint effort in 2013 London Hydro's RETROFIT program supported three key efficiency projects for City Centre. In the first two phases, exit and pot lighting was replaced with significantly less demanding LED's and all metal halide lighting in the main floor's common areas as well as the elevators were also switched to LED's.

In the final phase of the retrofit, booster pumps that move water through the towers were replaced with right sized, efficient motors. Demand for water has declined significantly since City Centre was completed in 1974 because of low-flush toilets, water-saving aerators and more conscientious water use, among other things. The building's oversized and aging 75 horsepower water booster pump motor was replaced with four, five horsepower motors, resulting in significant savings.

Throughout the process, London Hydro contributed expertise in evaluating the savings calculated by vendors and ensured the necessary paperwork was completed so that City Centre benefited from the full financial incentives available under the saveONenergy RETROFIT PROGRAM. London City Centre completed one project after the other realizing that the incentives could be rolled over into new projects; this further provided energy efficiencies and reduced the amount of capital investment required for each subsequent upgrade.

London companies played important roles in the process with Electrozad supplying lighting components, Ampro Electric supplying the new water booster pumps, and Lovett Electric performing the installations.

The Impact:

London Hydro's RETROFIT projects at London City Centre reduced electricity demand by nearly 75 kW and generate more than 350,000 kWh savings annually. This latter figure includes nearly 73,000 kWh in annual savings from the new water booster pumps and about 290,000 kWh saved by the new LED lighting. London Hydro's RETROFIT program provided financial savings though electrical reduction as well as incentives for the City Centre projects totaling $67,334 in 2013 alone.

Tenants are very pleased with the upgrades. TD Canada Trust, the largest tenant in the complex, places great value on its own environmental performance and appreciates management's efforts to attain the highest standards. Many people have commented on the brighter common areas. Benefits of the retrofits include lower maintenance and energy costs, a smaller carbon footprint and an improved indoor environment. This has the potential for impacts that include lower absenteeism and greater productivity for the 2,500 people who work in the towers every day.

London Hydro views London City Centre as an outstanding example of the success and savings that can be achieved when commercial buildings participate in the saveONenergy FOR BUSINESS suite of energy-efficiency programs.

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Appendix B.3, Local Promotion of CDM Successes

Nomination for MSEC Energy Saver Recognition

January 2014

Tolpuddle Housing Co-operative Collaborates to Save Energy

Good things like the project at Tolpuddle Housing Co-operative happen when people work together. Even better things can happen when organizations including London Hydro, the City of London's Water Engineering Division, Direct Energy and London's Fire Department join forces to deliver collaborative projects that result in lower costs, saved resources and increased safety.

London's Tolpuddle Housing Co-operative at the corner of Dundas and Adelaide contains 132 units of affordable housing in low and high-rise buildings. Recently, the co-op accessed a number of London Hydro saveONenergy programs to improve the housing complex's energy efficiency. These projects include the HOME ASSISTANCE program (HAP), RETROFIT PROGRAM and SMALL BUSINESS LIGHTING. These incentive programs are organized by the Ontario Power Authority and operated out of London Hydro's Conservation and Demand Management Department. They provide financial support for projects that replace outdated, inefficient equipment with energy-efficient technology that reduces electrical consumption and operating costs.

Built in the early 1990's, the building was in dire need of upgrading but there were limited funds to devote to improvements. London Hydro proposed a turnkey solution that incorporated incentive programs and creative partnerships to deliver a remarkable solution to many of the housing units' challenges.

The Projects:

London Hydro identified a number of opportunities to upgrade the lighting, appliances and electrical services in the Tolpuddle facilities. Sample installations were first completed in a unit and a hallway so that tenants, members of the board and the onsite manager could see the results for themselves. Everyone was impressed with the new look and features. All the products were either ENERGY STAR® qualified or had the highest efficiency ratings available. Other improvements included new refrigerators that were fully or partially paid for by London Hydro's saveONenergy programs.

By partnering with City of London's Water Engineering Division and accessing the HAP program, conservation staff from London Hydro replaced the leaky and broken toilets in every unit with new efficient models. Faucet leaks were also repaired. The total value of these upgrades was over $34,000, with London Hydro and the Water Engineering Division covering the costs. With support from Direct Energy, new, efficient gas hot water tanks, including pipe insulation, replaced aging and leaky units. Low flow aerators and efficient showerheads were also installed where they were needed.

London Hydro teamed up with the City's Fire Department (LFD) to test and repair or update all smoke alarms in each unit.

Impact:

Prior to the upgrades, London Hydro's analysis showed that the tenants and the Co-operative were paying approximately $59,000 annually for the energy used for lighting alone. As a result of the complete energy upgrade, Tolpuddle is seeing a direct reduction of more than $21,000 in utility costs every year.

In addition to lower energy costs for both tenants and the cooperative, there are several other advantages for the cooperative:

- Significantly reduced maintenance and repair costs since the new light bulbs are more cost effective and have longer lifespans
- Lowered investment in light bulb inventory since one bulb fits all the fixtures
- Guaranteed persistent energy cost reduction since only high efficiency bulbs will fit the new ENERGY STAR lighting fixtures

Furthermore as a result of the water efficiency upgrades, both water and energy costs were reduced along with the expense, inconvenience and damage caused by leaky fixtures and taps.

The testing, tuning up and replacement of smoke alarms mean tenants feel safe and secure.

In total, Tolpuddle Housing Co-operative agreed to $150,000 of efficiency and safety upgrades and realized $90,000 in incentives from London Hydro's saveONenergy programs. Going forward the Co-op anticipates a total 15% reduction in electric and water costs as a result of the efficiency upgrades.

London Hydro looks to the Tolpuddle Housing Co-operative as an outstanding example of the success and savings that can be achieved when social housing complexes participate in saveONenergy portfolio of energy conservation programs.

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Appendix B.4, Local Promotion of CDM Successes

Nomination for MSEC Energy Saver Recognition

January 2014

Cargill Chills Out to Save Energy

There's a new and welcome chill in the air at Cargill Value Added Meats in northeastern London. In 2013, Cargill completed a significant energy-efficiency upgrade to their process refrigeration systems at their poultry slaughtering and processing plant on Cuddy Boulevard in the Airport Industrial Park. Thanks to state-of-the-art refrigeration systems and the support of the provincial saveONenergy RETROFIT PROGRAM (that is operated by London Hydro within its franchise service territory), Cargill is now saving money and energy while reducing its carbon footprint.

Cargill is an international provider of food, agriculture and risk management products and services. Their Value Added Meats division operates four federally-regulated plants in Canada including the London facility where about 900 people are employed to process 80,000 chickens every day.

Nothing is wasted at this plant - once the edible parts of the chicken are removed, the organs are used for pet and animal feed and the blood and feathers are sold to a rendering company that makes ingredients for fertilizers, and other products like cosmetics, rubber and explosives. And that concept extends to the plant's energy use – inefficient electricity use is quite simply waste.

The Project:

Refrigeration systems are crucial to Cargill's sanitary and federally-regulated chicken processing and are responsible for a very significant portion of the plant's energy needs. In 2012, Cargill initially turned to London Hydro's saveONenergy RETROFIT PROGRAM for financial and technical support to create efficiencies and significant savings.

Efficiency in refrigeration is dependent on reducing the power needs of compressors. Compressors typically consume 62 percent of a system's energy needs and are like a heart, pumping refrigerant through the system to keep the refrigerated spaces cool, even on the hottest summer day. Upgrading of Cargill's refrigeration system was done in four steps. London Hydro has provided more than $121K in incentives for completion of the first three steps, and another $30K+ incentive is estimated for the fourth and final step of the project.

Drennan Refrigeration Inc of London was contracted by Cargill to carry out the engineering, installation and commissioning of the project's components.

The first step in a multi-year undertaking was to replace Cargill's rooftop condenser units (i.e. heat exchangers that dissipate heat removed from the refrigerated areas into the outdoor ambient air) with larger units. The bigger fans and extra capacity lowered the head pressure and temperature, providing significant energy efficiencies by reducing the amount of work that the compressors need to do to compress and circulate the refrigerant.

Canada's variable climate means that demands on the refrigeration system can fluctuate significantly and the system has to be able to meet the peak demands of the hottest, most humid summer day. The trick to attaining efficiency is to ensure that compressors share the load in a manner that each unit is operated at its respective optimal loading condition. In the second step of the upgrading project, the original compressor controls were replaced with a networked system to ensure that the compressors work together in a balanced way to attain optimal efficiency.

As the third step, Cargill installed a new system to purge air and water from the ammonia used in the chilling process. The old system only removed air and not water, both of which can build up in the ammonia and raise its temperature, requiring more energy for cooling the refrigerant. As the temperature increases, a lower suction pressure is required to cool the extra heat, putting demands on the compressor motors. With the air and water gone from the ammonia, the system doesn't have to work as hard and it uses less energy.

As the fourth and final step, additional controls are being installed and some adjustments to booster pumps are being made to further improve the overall efficiency of the refrigeration system. Measurements to verify achievement of the predicted energy-efficiency gains will soon be underway.

Cargill is committed to lowering its energy consumption and previously upgraded its lighting systems also with the financial support of the saveONenergy RETROFIT PROGRAM. The chicken processing company plans further measures to reduce its energy footprint via an Energy Management Information System (EMIS) that is now in-service and will shortly receive additional incentives under the saveONenergy PROCESS & SYSTEMS program. The EMIS will be a valuable tool for targeting other energy-efficiency opportunities going forward.

Impact:

As a result of the improvements to their refrigeration system, Cargill has so far reduced its annual energy consumption by more than 1.2 million kWh representing about $145,000 in bill savings. This amount represents the power consumed annually by at least 140 homes in London and is equivalent to taking 27 cars off the road. Together, the improvements resulted in a 21% reduction in the amount of energy consumed by Cargill in the six months following implementation, as compared to the same time period in the previous year.

London Hydro looks to Cargill as an outstanding example of the success and savings that can be achieved when companies participate in the saveONenergy FOR BUSINESS suite of energy-efficiency programs.

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Appendix C, Cross-Reference Between Program Marketing Names and Master Agreement Schedule Identifiers

The marketing or customer-facing names of the various provincial (Tier1) CDM programs are quite different from the CDM program identifiers used within the Master CDM Program Agreement between the Ontario Power Authority and community of Local Distribution Companies (LDC's).

The following tabulation provides a cross-reference between the customer-facing CDM program names (Column 1) and the identifiers used in legal agreements (Columns 2 and 3). Column 4 indicates the date when the various schedules were posted for acceptance by the LDC community. Column 5 indicates the date when London Hydro's subscription to each provincial CDM program was recognized on their iCon web portal interface.

Customer-Facing (Marketing) Name of Initiative	Name of Initiative within OPA's Master CDM Agreement	Schedule within OPA's Master CDM Agreement	Date Schedule Posted	Date London Hydro Subscribed
(Col 1)	(Col 2)	(Col 3)	(Col 4)	(Col 5)
saveONenergy FOR HOME Portfolio:				
saveONenergy FRIDGE & FREEZER PICKUP	Appliance Retirement	Schedule B-1, Exhibit D	January 26, 2011	February 22, 2011
saveONenergy HEATING & COOLING INCENTIVE	HVAC Incentives	Schedule B-1, Exhibit B	January 26, 2011	February 22, 2011
saveONenergy *peaksaver* PLUS	Residential Demand Response	Schedule B-3	August 22, 2011	
saveONenergy COUPON EVENT	Conservation Instant Coupon Booklet	Schedule B-1, Exhibit A	January 26, 2011	February 22, 2011
saveONenergy EXCHANGE EVENT	Appliance Exchange	Schedule B-1, Exhibit E	January 26, 2011	February 22, 2011
--	Bi-Annual Retailer Event	Schedule B-1, Exhibit C	January 26, 2011	February 22, 2011
	Home Energy Assessment Tool			
	Midstream Electronics			
	Midstream Pool Equipment			
saveONenergy FOR BUSINESS Portfolio:				

Customer-Facing (Marketing) Name of Initiative	Name of Initiative within OPA's Master CDM Agreement	Schedule within OPA's Master CDM Agreement	Date Schedule Posted	Date London Hydro Subscribed
(Col 1)	(Col 2)	(Col 3)	(Col 4)	(Col 5)
saveONenergy DEMAND RESPONSE VOLUNTARY DR1	Demand Response 1	Schedule D-5		February 22, 2011
saveONenergy DEMAND RESPONSE CONTRACTUAL DR3	Demand Response 3	Schedule D-6	May 31, 2011	February 22, 2011
saveONenergy SMALL BUSINESS LIGHTING	Direct Install Lighting and Water Heating	Schedule C-3	January 26, 2011	February 22, 2011
saveONenergy SMALL BUSINESS A/C	Direct Service Space Cooling	Schedule C-5	January 26, 2011	February 22, 2011
saveONenergy RETROFIT PROGRAM	Efficiency: Equipment Replacement Incentive	Schedule C-2	January 26, 2011	February 22, 2011
saveONenergy AUDIT FUNDING	Energy Audit	Schedule C-1	January 26, 2011	February 22, 2011
saveONenergy EXISING BUILDING COMMISSIONING	Building Commissioning	Schedule C-6		February 22, 2011
saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION	New Construction and Major Renovation	Schedule C-4	February, 2011	February 22, 2011
saveONenergy PROCESS & SYSTEMS	Process & Systems Upgrades	Schedule D-1	May 31, 2011	April 11, 2011
"	Monitoring & Targeting	Schedule D-2	May 31, 2011	April 11, 2011
"	Energy Manager	Schedule D-3	May 31, 2011	April 11, 2011
"	Key Account Manager	Schedule C-4	May 31, 2011	April 11, 2011
saveONenergy NEW HOME CONSTRUCTION	New Construction Program	Schedule B-2	January 26, 2011	April 11, 2011
Low-Income Programs:				
saveONenergy HOME ASSISTANCE	Home Assistance Program	Schedule E-1	May 9, 2011	August 18, 2011

Notes:

1. Although the saveONenergy *peaksaver* PLUS initiative is primarily targeted to residential customers with central air conditioning systems, small business customers can also participate (although the latter won't receive an in-home display), the initiative has been categorized in the above tabulation under the saveONenergy FOR HOME portfolio.
2. The saveONenergy NEW HOME CONSTRUCTION is marketed to both residential customers (for the purposes of awareness) and new home builders. Since London Hydro primary interactions are with new home builders, this program has been categories herein as a "*business*" program. Other LDC's may well categorize it differently in their respective Annual CDM Report.
3. The information is column 4 (date posted) can be somewhat misleading. For example, Schedule E-1 for the saveONenergy HOME ASSISTANCE program shows a posted date of May 9th, 2011 implying that the program was ready for delivery to eligible customers on that date. The unfortunate reality is that it wasn't' until late summer of 2012 (i.e. well more than a year later) that there was a payment process in place and the calculation tool used by assessors (i.e. the so-called Field Audit Support Tool) was finally corrected to a satisfactory state – refer to announcement in OPA E-Blast dated August 24th, 2012.

Appendix D, Summarized Province-Wide EM&V Findings

The Ontario Power Authority has retained a number of program evaluation contractors to assess the 2013 performance of each of the provincial CDM programs. The key evaluation findings given below have been provided by the Ontario Power Authority to the community of LDCs. It is understood that the actual reports prepared by the various EM&V contractors won't be available until Q4 of 2014.

Customer-Facing Name of CDM Initiative	**Province-Wide Key Evaluation Findings**
(Col 1)	**(Col 2)**
saveONenergy FOR HOME Portfolio:	
saveONenergy FRIDGE & FREEZER PICKUP	• Per unit savings increased for both energy (+15.4%) and demand (+4.0%) between 2012 and 2013 due to a greater proportion of refrigerators/freezers with large volumes and a manufacturer date before National Appliance Energy Conservation Act (NAECA) was implemented. Dehumidifiers also show a higher per unit savings related to the change in ENERGY STAR definitions. • Overall participation continues to decline with 20,952 appliances recycled in 2013, compared with 34,146 in 2012 and 56,110 in 2011. The program has experienced close to a 40% reduction (39.1% 2011 to 2012, 41.1% 2012 to 2013) in recycled appliances in each subsequent year of operation. • Net to gross ratio stayed constant at around 43% between 2012 and 2013
saveONenergy HEATING & COOLING INCENTIVE	• Total participation (equipment) increased 7.5% from 2012 to 91,581. • Per unit furnace savings decreased from 1139 kWh/yr in 2012 to 1090 kWh/yr due to a slight shift in the number of participants who use their furnace fan non-continuously both before and after the retrofit as opposed to changing from continuous to non-continuous operation • Per unit energy and demand savings assumptions for central air conditioners did not change from 2012.
saveONenergy peaksaver PLUS	• The cycling strategy for CAC load control was changed from 50% simple cycling to 60% simple cycling. • Under 1-in-10 year weather conditions, the 2013 estimated impacts for load control devices are higher than the 2012 estimates in all months and are between 10 and 15% higher during the core summer months of June through August. • Load impact estimates for the average small and medium business and for electric water heaters among residential customers are also unchanged from the prior year's analysis • This year's IHD analysis has yielded an estimate of no statistically significant energy savings.
saveONenergy COUPON EVENT	Bi-Annual Retailer Event: • 19% increase in the number of coupons redeemed during the Spring and Fall Events in 2013 compared to

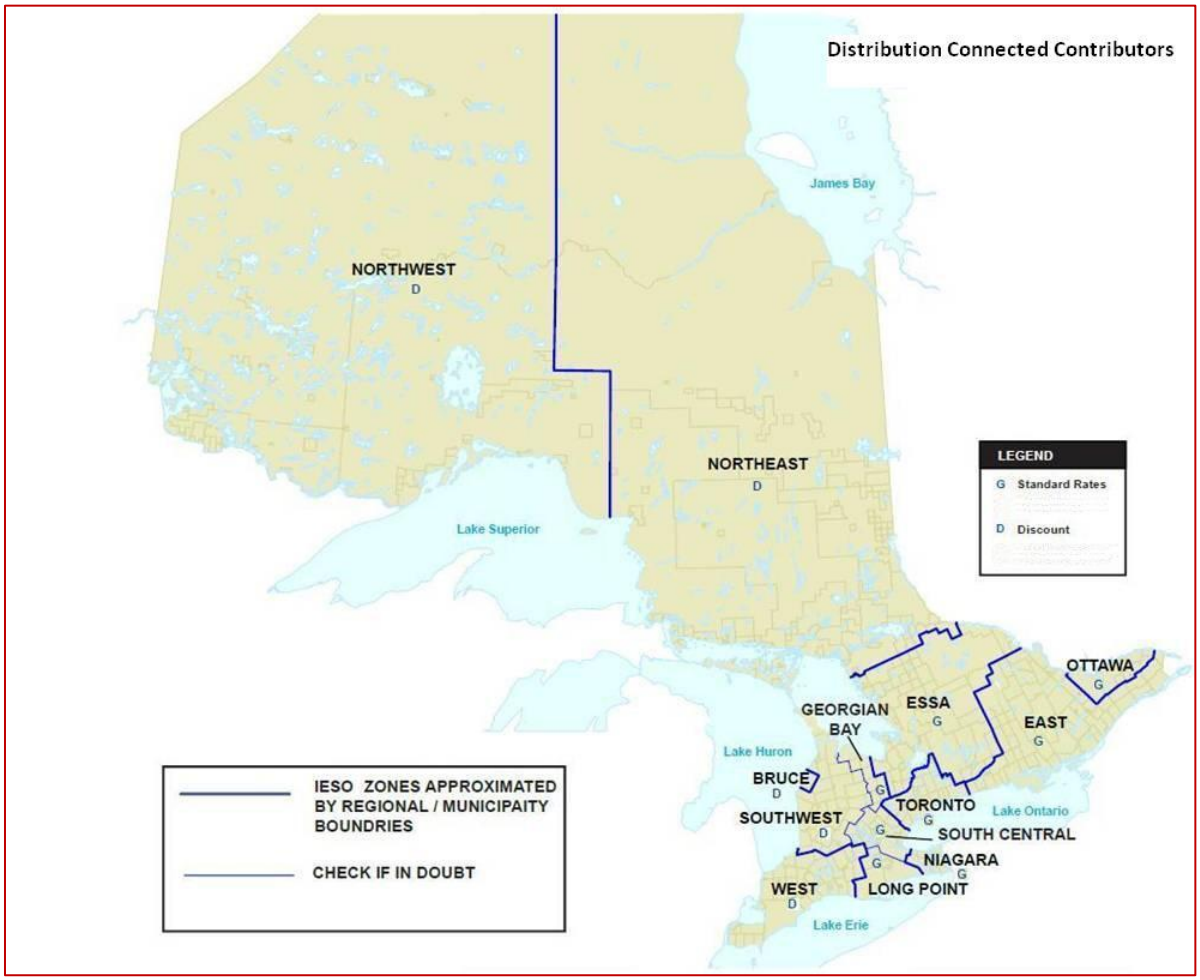
Customer-Facing Name of CDM Initiative	Province-Wide Key Evaluation Findings
(Col 1)	(Col 2)
	2012 because of substantial increase in LED purchases with event coupons. • 36% lower net annual savings in 2013 compared to 2012 primarily because of significant reductions in per unit savings estimates for standard and specialty CFLs. In 2013, findings showed a decrease in replacement rate of incandescent bulbs. Only 30% of 2013 participants are estimated to have replaced incandescent bulbs compared to 60% of participants replacing incandescent bulbs in 2012. This leads to a change in the baseline assumption for the savings calculations. • 87% of coupons redeemed were for general purpose and specialty CFLs and LEDs, producing 80% of net annual energy savings and 73% of net demand savings • Measure NTG ratio was approximately 8% higher in 2013 than in 2012 due to the inclusion of participant like spillover, i.e., purchase of additional coupon initiative measures without using coupons because of program influence. <u>Annual Coupons</u>: • Customers redeemed more than ten times as many annual coupons in 2013 as in 2012 because of new LED coupons and full year availability of all coupons. Customers redeemed 13% more annual coupons in 2013 than in 2011, the first full year of annual coupons due to the high volume of new LED coupons. • There was a significant reduction in savings specialty CFL related measures. In 2013, the findings showed around 30% of participants are replacing incandescent bulbs compared to 60% of participants replacing incandescent bulbs in 2012. • Despite the significant per unit savings reductions, the Net Annual Savings from Annual Coupons in 2013 was more than 5.5 times that in 2012. This is primarily because of higher participation due to the inclusion of LED coupons and full year availability of all coupons. • 93% of coupons redeemed in 2013 were for general purpose LEDS and specialty CFLs and LEDs, producing 89% of net annual energy savings and 84% of net demand savings. • Measure NTG ratio was approximately 8% higher in 2013 than in 2012 due to the inclusion of participant like spillover, i.e., purchase of additional coupon initiative measures without using coupons because of program influence.
saveONenergy EXCHANGE EVENT	• Increased per unit energy and demand savings due to an adjustment to the assumed consumption of "conventional" and Energy Star dehumidifiers. The calculated weighted average annual energy savings of a exchanged dehumidifier increased 36.6% • Of the participants surveyed who reported they had replaced the dehumidifiers they exchanged, 100% reported purchasing ENERGY STAR® models. • 21% increase in the number of eligible dehumidifiers collected in the program. In 2013, 5,337

Customer-Facing Name of CDM Initiative	Province-Wide Key Evaluation Findings
(Col 1)	(Col 2)
	dehumidifier units were collected compared to 3,617 dehumidifier units and 219 window air conditioners. • Net to Gross ratio (NTG) was 52.6% which is a slight increase of the 2012 NTG of 51.5%
saveONenergy FOR BUSINESS Portfolio:	
saveONenergy DEMAND RESPONSE VOLUNTARY DR1	This program was previously withdrawn from the marketplace due to lack of participation.
saveONenergy DEMAND RESPONSE CONTRACTUAL DR3	• The largest 20 contributors account for 60% of the contractual demand reduction – in other words, less than 5% of contributors account for the majority of the load reductions. • In 2013, DR-3 was successfully dispatched locally for the first time in order to provide assistance in restoring power after a prolonged power outage due to substation flooding.
saveONenergy SMALL BUSINESS LIGHTING	• In 2013 the initiative introduced: a) an increase in the incentive to $1500 from $1000, b) new LED measures c) Agribusiness eligibility, resulting in the stabilization of participation and an increase in savings. • 17,782 projects completed in 2013 (3.8% decrease from 2012) • However, 12.2% increase in Net Verified Energy Savings relative to 2012. • The average incentive per project and savings per project both increased between 2012 to 2013 • Net to Gross ratio (NTG) for 2013 remained unchanged at 94%
saveONenergy RETROFIT PROGRAM	• A total of 8,785 projects completed in 2013. Reported energy savings for individual projects ranged from 1 kWh to over 5,000,000 kWh • Net to Gross ratio (NTG) for energy was 72.8%, consistent with prior years • NTG for demand was 72.0%, consistent with prior years • NTG ratios are comparable to similar programs across North America
saveONenergy AUDIT FUNDING	• 319 audits were completed in 2013 • 2013 sample saw more recommended measures implemented without incentives (33% in 2013 vs. 13% in 2012) • The average per audit summer peak demands savings is estimated to be 13 kW.
saveONenergy EXISING BUILDING COMMISSIONING	• 29 unique participants in the 2013 population • No Commissioning projects completed the hand-off/completion phase in 2013

Customer-Facing Name of CDM Initiative	Province-Wide Key Evaluation Findings
(Col 1)	(Col 2)
	• Improvements to the chilled water system controls were the most commonly targeted measure. • Large variation in estimated savings results between preliminary investigation phase and actual implementation phase
saveONenergy HIGH PERFORMANCE NEW CONSTRUCTION	• Number of projects increased by 25% from 69 in 2012 to 86 in 2013. • Custom projects, representing only about 8% of the total number of projects, account for 67% of verified demand savings and 54% of verified energy savings. • A realization rate of 72% for energy savings is low due to the low realization rate of the Agribusiness high ventilation, low speed fans which comprised of 15 % of the HPNC prescriptive project energy savings. • Net-to-gross ratio for the initiative was higher by 5% from 49% in 2012 to 54% in 2013.
saveONenergy PROCESS & SYSTEMS	• In 2013, three PSUI projects were put into service. Projects were very well documented and technical reviews were thorough. Most projects are delivering the level of energy savings expected or more (realization rates of 87% for energy savings and 86% for summer demand savings) • Good level of quality on M&V conducted in each project. The level of free-ridership was found to be very low, at only 7% for energy savings and 6% for demand savings, and no spillover was identified. • Energy Managers are seen as important drivers of program enabled savings projects. Almost a 300% increase vs. 2012 in the amount of energy savings from program enabled savings projects.
saveONenergy NEW HOME CONSTRUCTION	• Energy and demand savings for the Initiative increased by 300% compared to the combined 2011 and 2012 results ; number of projects also increased from 45 in 2011 and 2012 to 86 in 2013. • All projects are opting for the prescriptive or performance path. No custom project applications were received in 2013, similar to 2011-2012 • Net-to-gross ratio for the initiative was higher by 14% from 49% in 2012 to 63% in 2013.
Low-Income Programs:	
saveONenergy HOME ASSISTANCE	• Participation increased significantly to 26,756 participants in 2013 from 5,033 in 2012 • Realization rates were slightly lower in 2013 (0.88 for kWh and 0.26 for kW) than in 2012 (0.98 for kWh and 0.32 for kW) primarily due to updated verified per unit assumptions . • Realization rate for demand savings remained low as FAST Tool calculated kW savings for certain insulation measures remained very high and recommended revisions to kW savings factors were not yet in use in 2013 (changes to the FAST Tool to address these issues were made in early 2014)

Appendix E, Map of Settlement Zones for Demand Response

This map shows the demand response settlement zones throughout the Province. London is located in the "West" settlement zone.



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Message from the Vice President:

The OPA is pleased to provide you with the enclosed Final 2013 Verified Results Report.

2013 Report highlights:

- We have achieved 86% of our cumulative energy savings target and 48% of our annual peak demand savings target to date (Scenario 2).

  By the end of 2013, 42 LDCs have exceeded 80% of their energy target and 19 LDCs have met or exceeded their 2011-14 energy target.
- In 2013, LDCs have achieved over 600 GWh in savings, representing an increase of 20% over the 2012 net incremental energy savings results.
- The BUSINESS PROGRAM continues to generate strong interest and participation amongst business customers with significant savings results. 71% of total energy savings in 2013 came from the BUSINESS PROGRAM and its momentum continues. Also, as the program matures, we are seeing more and more studies in the PROCESS AND SYSTEMS pipeline converting to completed projects.
- Within 4 cents per kWh, Conservation programs continue to be a valuable and cost effective resource for customers across the province.

2013 has been a year of significant operational advancements centered around creating a better customer and LDC experience:

- A number of operational changes were made in 2013 to enhance processes, such as payment of LDC invoices streamlined to an average of 20 days, enhanced reporting and iCon updates to improve users' experience.
- Proactive updates to measures incentivized through saveONenergy have allowed programs to stay ahead of changing market conditions. Specifically in 2013, LEDs became popular measures in both the Consumer and Business programs.
- Technical tools also played a significant role in 2013, which included an updated Measure and Assumptions List as well as new and improved engineering worksheets for RETROFIT which allow customers to more easily access programs by building strong business cases based on latest estimates of savings potential.
- The Conservation Fund introduced the LDC Fast Track stream to support LDCs with innovative program ideas. 2013 LDC pilots included Oshawa PUC Networks Inc.'s retro-commissioning program, Toronto Hydro-Electric System Limited multi-unit demand response, and Niagara-on-the-Lake Hydro Inc.'s electric vehicles load shifting program.
- Key market sectors were also engaged in 2013 through Capability Building programs targeted at Home Builders and HVAC Installers to build conservation knowledge with these partners. Energy Efficiency Services Programs (EESPs) also provided valuable support to a variety of sectors.

The format of this report was developed in collaboration with the Reporting Working Group and is designed to help LDCs populate their 2013 Annual Reports that will be submitted to the OEB by September 30th. Any additional 2013 program activity not captured here will be reported in your Final 2014 Verified Results Report.

Please continue to monitor saveONenergy E-blasts for any further updates and should you have any other questions or comments please contact LDC.Support@powerauthority.on.ca.

We appreciate your ongoing collaboration and cooperation throughout the reporting and evaluation process. We look forward to another successful year in 2014.

Sincerely,

Andrew Pride

Table of Contents

OPA-Contracted Province-Wide CDM Programs Final Verified 2013 Results

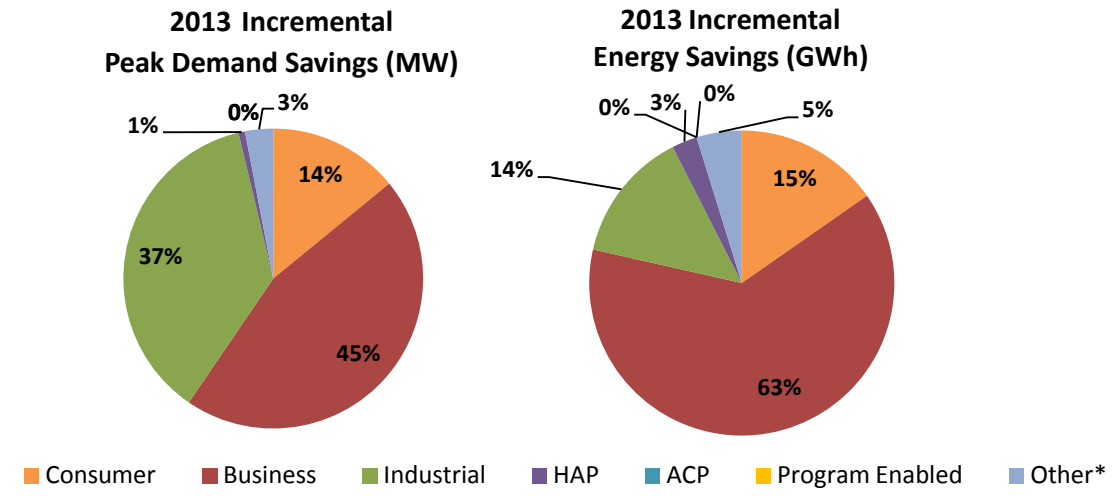
LDC: London Hydro Inc.

FINAL 2013 Progress to Targets	2013 Incremental	Program-to-Date Progress to Target (Scenario 1)	Scenario 1: % of Target Achieved	Scenario 2: % of Target Achieved
Net Annual Peak Demand Savings (MW)	5.9	10.2	**24.6%**	**30.5%**
Net Energy Savings (GWh)	15.8	157.4	**100.5%**	**100.5%**

Scenario 1 = Assumes that demand response resources have a persistence of 1 year

Scenario 2 = Assumes that demand response resources remain in the LDC service territory until 2014

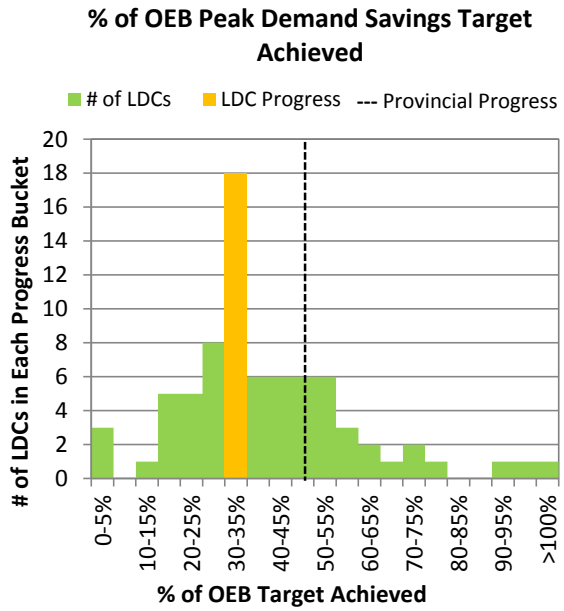
Achievement by Sector



**Other includes adjustments to previous years' results and savings from pre-2011 initiatives*

Comparison: LDC Achievement vs. LDC Community Achievement (Progress to Target)

The following graphs assume that demand response resources remain in the LDC service territory until 2014 (aligns with Scenario 2)



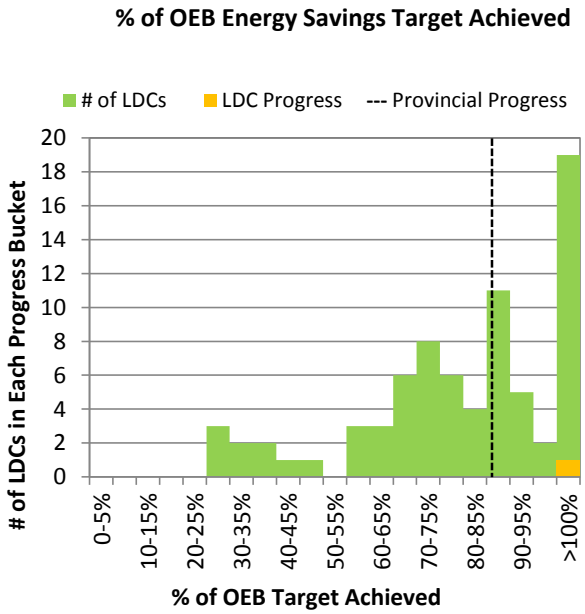


Table 1: London Hydro Inc. Initiative and Program Level Net Savings by Year (Scenario 1)

Initiative	Unit	Incremental Activity (new program activity occurring within the specified reporting period)				Net Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Net Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)				Program-to-Date Verified Progress to Target (excludes DR)	
														2014 Net Annual Peak Demand Savings (kW)	2011-2014 Net Cumulative Energy Savings (kWh)
		2011*	2012*	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2014	2014
Consumer Program															
Appliance Retirement	Appliances	2,458	2,370	1,970		167	179	175		1,002,610	855,873	711,246		507	7,988,641
Appliance Exchange	Appliances	118	65	108		12	10	22		15,910	17,215	39,900		38	188,939
HVAC Incentives	Equipment	3,318	3,029	2,889		1,052	652	591		1,901,868	1,100,981	993,659		2,295	12,897,735
Conservation Instant Coupon Booklet	Items	13,923	844	9,473		32	6	14		512,644	38,182	210,480		52	2,586,085
Bi-Annual Retailer Event	Items	26,002	28,971	25,800		46	40	32		802,521	731,361	469,152		119	6,342,471
Retailer Co-op	Items	0	0	0		0	0	0		0	0	0		0	0
Residential Demand Response	Devices	0	0	0		0	0	0		0	0	0		0	0
Residential Demand Response (IHD)	Devices	0	0	0		0	0	0		0	0	0		0	0
Residential New Construction	Homes	0	0	0		0	0	0		0	0	0		0	0
Consumer Program Total						**1,309**	**887**	**835**		**4,235,553**	**2,743,613**	**2,424,437**		**3,010**	**30,003,871**
Business Program															
Retrofit	Projects	126	285	324		1,034	2,148	1,823		5,260,353	10,433,795	8,544,440		4,789	68,473,160
Direct Install Lighting	Projects	46	84	154		56	61	167		145,929	228,414	628,090		277	2,501,882
Building Commissioning	Buildings	0	0	0		0	0	0		0	0	0		0	0
New Construction	Buildings	0	2	1		0	5	6		0	19,535	9,175		11	76,957
Energy Audit	Audits	9	1	17		0	0	150		0	0	823,663		150	1,647,326
Small Commercial Demand Response	Devices	0	0	0		0	0	0		0	0	0		0	0
Small Commercial Demand Response (IHD)	Devices	0	0	0		0	0	0		0	0	0		0	0
Demand Response 3	Facilities	5	6	6		487	533	547		19,012	7,751	8,163		0	34,925
Business Program Total						**1,577**	**2,746**	**2,693**		**5,425,294**	**10,689,495**	**10,013,531**		**5,227**	**72,734,250**
Industrial Program															
Process & System Upgrades	Projects	0	0	0		0	0	0		0	0	0		0	0
Monitoring & Targeting	Projects	0	0	0		0	0	0		0	0	0		0	0
Energy Manager	Projects	0	9	21		0	1	273		0	30,445	2,171,119		10	2,309,417
Retrofit	Projects	17	0	0		128	0	0		756,174	0	0		127	3,021,719
Demand Response 3	Facilities	4	4	6		2,137	994	1,905		125,454	23,964	43,378		0	192,796
Industrial Program Total						**2,265**	**996**	**2,178**		**881,628**	**54,409**	**2,214,498**		**138**	**5,523,932**
Home Assistance Program															
Home Assistance Program	Homes	0	330	498		0	29	42		0	304,467	427,264		71	1,767,930
Home Assistance Program Total						**0**	**29**	**42**		**0**	**304,467**	**427,264**		**71**	**1,767,930**
Aboriginal Program															
Home Assistance Program	Homes	0	0	0		0	0	0		0	0	0		0	0
Direct Install Lighting	Projects	0	0	0		0	0	0		0	0	0		0	0
Aboriginal Program Total						**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**
Pre-2011 Programs completed in 2011															
Electricity Retrofit Incentive Program	Projects	130	0	0		1,359	0	0		9,726,531	0	0		1,359	38,906,125
High Performance New Construction	Projects	5	3	0		169	95	0		865,905	273,104	0		263	4,282,930
Toronto Comprehensive	Projects	0	0	0		0	0	0		0	0	0		0	0
Multifamily Energy Efficiency Rebates	Projects	0	0	0		0	0	0		0	0	0		0	0
LDC Custom Programs	Projects	0	0	0		0	0	0		0	0	0		0	0
Pre-2011 Programs completed in 2011 Total						**1,528**	**95**	**0**		**10,592,436**	**273,104**	**0**		**1,623**	**43,189,055**
Other															
Program Enabled Savings	Projects	0	0	0		0	0	0		0	0	0		0	0
Time-of-Use Savings	Homes	0	0	0		0	0	0		0	0	0		0	0
Other Total						**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**
Adjustments to 2011 Verified Results							**-23**	**0**			**336,008**	**0**		**-34**	**1,311,482**
Adjustments to 2012 Verified Results								**180**				**758,668**		**157**	**2,918,866**
Energy Efficiency Total						**4,054**	**3,225**	**3,295**		**20,990,445**	**14,033,373**	**15,028,189**		**10,068**	**152,991,317**
Demand Response Total (Scenario 1)						**2,624**	**1,528**	**2,452**		**144,465**	**31,715**	**51,541**		**0**	**227,721**
Adjustments to Previous Years' Verified Results Total						**0**	**-23**	**180**		**0**	**336,008**	**758,668**		**123**	**4,230,348**
OPA-Contracted LDC Portfolio Total (inc. Adjustments)						**6,678**	**4,730**	**5,927**		**21,134,911**	**14,401,096**	**15,838,399**		**10,190**	**157,449,386**
													Full OEB Target:	**41,440**	**156,640,000**
													% of Full OEB Target Achieved to Date (Scenario 1):	**24.6%**	**100.5%**

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

*Includes adjustments after Final Reports were issued

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is made available.

Energy Manager, Aboriginal Program and Program Enabled Savings were not independently evaluated

Table 2: Adjustments to London Hydro Inc. Net Verified Results due to Variances

Initiative	Unit	Incremental Activity (new program activity occurring within the specified reporting period)				Net Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Net Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)			
		2011*	2012*	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program													
Appliance Retirement	Appliances	0	0			0	0			0	0		
Appliance Exchange	Appliances	0	0			0	0			0	0		
HVAC Incentives	Equipment	-508	36			-137	7			-245,124	13,783		
Conservation Instant Coupon Booklet	Items	224	0			0	0			7,528	0		
Bi-Annual Retailer Event	Items	2,234	0			3	0			59,625	0		
Retailer Co-op	Items	0	0			0	0			0	0		
Residential Demand Response	Devices	0	0			0	0			0	0		
Residential Demand Response (IHD)	Devices	0	0			0	0			0	0		
Residential New Construction	Homes	0	0			0	0			0	0		
Consumer Program Total						**-134**	**7**			**-177,972**	**13,783**		
Business Program													
Retrofit	Projects	8	24			56	161			297,630	695,903		
Direct Install Lighting	Projects	6	10			9	6			23,308	23,807		
Building Commissioning	Buildings	0	0			0	0			0	0		
New Construction	Buildings	0	0			0	0			0	0		
Energy Audit	Audits	9	1			47	5			226,586	25,176		
Small Commercial Demand Response	Devices	0	0			0	0			0	0		
Small Commercial Demand Response (IHD)	Devices	0	0			0	0			0	0		
Demand Response 3	Facilities	0	0			0	0			0	0		
Business Program Total						**112**	**173**			**547,524**	**744,886**		
Industrial Program													
Process & System Upgrades	Projects	0	0			0	0			0	0		
Monitoring & Targeting	Projects	0	0			0	0			0	0		
Energy Manager	Projects	0	3			0	68			0	719,235		
Retrofit	Projects	0	0			0	0			0	0		
Demand Response 3	Facilities	0	0			0	0			0	0		
Industrial Program Total						**0**	**68**			**0**	**719,235**		
Home Assistance Program													
Home Assistance Program	Homes	0	0			0	0			0	0		
Home Assistance Program Total						**0**	**0**			**0**	**0**		
Aboriginal Program													
Home Assistance Program	Homes	0	0			0	0			0	0		
Direct Install Lighting	Projects	0	0			0	0			0	0		
Aboriginal Program Total						**0**	**0**			**0**	**0**		
Pre-2011 Programs completed in 2011													
Electricity Retrofit Incentive Program	Projects	0	0			0	0			0	0		
High Performance New Construction	Projects	0	0			-2	0			-33,545	0		
Toronto Comprehensive	Projects	0	0			0	0			0	0		
Multifamily Energy Efficiency Rebates	Projects	0	0			0	0			0	0		
LDC Custom Programs	Projects	0	0			0	0			0	0		
Pre-2011 Programs completed in 2011 Total						**-2**	**0**			**-33,545**	**0**		
Other													
Program Enabled Savings	Projects	0	0			0	0			0	0		
Time-of-Use Savings	Homes	0	0			0	0			0	0		
Other Total						**0**	**0**			**0**	**0**		
Adjustments to 2011 Verified Results						**-23**				**336,008**			
Adjustments to 2012 Verified Results							**248**				**1,477,904**		
Total Adjustments to Previous Years' Verified Results						**-23**	**248**			**336,008**	**1,477,904**		

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is made available.

Adjustments to previous years' results shown in this table will not align to adjustments shown in Table 1 as the information presented above does not consider persistence of savings

Table 3: London Hydro Inc. Realization Rate & NTG

Initiative	Peak Demand Savings								Energy Savings							
	Realization Rate				Net-to-Gross Ratio				Realization Rate				Net-to-Gross Ratio			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program																
Appliance Retirement	1.00	1.00	n/a		0.49	0.43	0.42		1.00	1.00	n/a		0.52	0.46	0.44	
Appliance Exchange	1.00	1.00	1.00		0.52	0.52	0.53		1.00	1.00	1.00		0.52	0.52	0.53	
HVAC Incentives	1.00	1.00	n/a		0.61	0.50	0.48		1.00	1.00	n/a		0.60	0.49	0.48	
Conservation Instant Coupon Booklet	1.00	1.00	1.00		1.14	1.00	1.11		1.00	1.00	1.00		1.11	1.05	1.13	
Bi-Annual Retailer Event	1.00	1.00	1.00		1.13	0.91	1.04		1.00	1.00	1.00		1.10	0.92	1.04	
Retailer Co-op	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Residential Demand Response	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Residential Demand Response (IHD)	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Residential New Construction	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Business Program																
Retrofit	0.92	0.95	0.94		0.73	0.77	0.76		1.23	1.10	1.10		0.75	0.77	0.77	
Direct Install Lighting	1.08	0.68	0.81		0.93	0.94	0.94		0.90	0.85	0.84		0.93	0.94	0.94	
Building Commissioning	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
New Construction	n/a	0.97	0.53		n/a	0.49	0.54		n/a	1.52	0.73		n/a	0.49	0.54	
Energy Audit	n/a	n/a	1.02		n/a	n/a	0.66		n/a	n/a	0.97		n/a	n/a	0.66	
Small Commercial Demand Response	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Small Commercial Demand Response (IHD)	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Demand Response 3	0.76	n/a	n/a		n/a	n/a	n/a		1.00	n/a	n/a		n/a	n/a	n/a	
Industrial Program																
Process & System Upgrades	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Monitoring & Targeting	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Energy Manager	n/a	0.46	0.90		n/a	0.90	0.90		n/a	0.46	0.90		n/a	0.90	0.90	
Retrofit																
Demand Response 3	0.84	n/a	n/a		n/a	n/a	n/a		1.00	n/a	n/a		n/a	n/a	n/a	
Home Assistance Program																
Home Assistance Program	n/a	1.11	1.04		n/a	1.00	1.00		n/a	1.00	0.88		n/a	1.00	1.00	
Aboriginal Program																
Home Assistance Program	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Direct Install Lighting	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Pre-2011 Programs completed in 2011																
Electricity Retrofit Incentive Program	0.94	n/a	n/a		0.60	n/a	n/a		0.95	n/a	n/a		0.60	n/a	n/a	
High Performance New Construction	1.00	1.00	1.00		0.50	0.50	0.50		1.00	1.00	1.00		0.50	0.50	0.50	
Toronto Comprehensive	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Multifamily Energy Efficiency Rebates	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
LDC Custom Programs	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Other																
Program Enabled Savings	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Time-of-Use Savings	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	

Energy Manager, Aboriginal Program and Program Enabled Savings were not independently evaluated

Summary Progress Towards CDM Targets

Results are attributed to target using current OPA reporting policies. Energy efficiency resources persist for the duration of the effective useful life. Any upcoming code changes are taken into account. Demand response resources persist for 1 year (Scenario 1). Please see methodology tab for more detailed information.

Table 4: Net Peak Demand Savings at the End User Level (MW) (Scenario 1)

Implementation Period	Annual			
	2011	2012	2013	2014
2011 - Verified	6.7	4.1	4.1	4.0
2012 - Verified†	0.0	4.7	3.1	3.1
2013 - Verified†	0.0	0.2	5.9	3.1
2014				
Verified Net Annual Peak Demand Savings Persisting in 2014:				10.2
London Hydro Inc. 2014 Annual CDM Capacity Target:				41.4
Verified Portion of Peak Demand Savings Target Achieved in 2014 (%):				24.6%

Table 5: Net Energy Savings at the End User Level (GWh)

Implementation Period	Annual				Cumulative
	2011	2012	2013	2014	2011-2014
2011 - Verified	21.1	21.0	21.0	20.9	84.0
2012 - Verified†	0.3	14.4	14.1	13.9	42.7
2013 - Verified†	0.0	1.5	15.8	13.4	30.7
2014					
Verified Net Cumulative Energy Savings 2011-2014:					157.4
London Hydro Inc. 2011-2014 Annual CDM Energy Target:					156.6
Verified Portion of Cumulative Energy Target Achieved in 2014 (%):					100.5%

†Includes adjustments to previous Years' verified results

Table 6: Province-Wide Initiatives and Program Level Net Savings by Year (Scenario 1)

Initiative	Unit	Incremental Activity (new program activity occurring within the specified reporting period)				Net Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Net Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)				Program-to-Date Verified Progress to Target (excludes DR)	
														2014 Net Annual Peak Demand Savings (kW)	2011-2014 Net Cumulative Energy Savings (kWh)
		2011*	2012*	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2014	2014
Consumer Program															
Appliance Retirement	Appliances	56,110	34,146	20,952		3,299	2,011	1,433		23,005,812	13,424,518	8,713,107		6,605	149,603,072
Appliance Exchange	Appliances	3,688	3,836	5,337		371	556	1,106		450,187	974,621	1,971,701		1,795	8,455,927
HVAC Incentives	Equipment	92,743	87,427	91,581		32,037	19,060	19,552		59,437,670	32,841,283	33,923,592		70,650	404,121,713
Conservation Instant Coupon Booklet	Items	567,678	30,891	346,896		1,344	230	517		21,211,537	1,398,202	7,707,573		2,091	104,455,900
Bi-Annual Retailer Event	Items	952,149	1,060,901	944,772		1,681	1,480	1,184		29,387,468	26,781,674	17,179,841		4,345	232,254,579
Retailer Co-op	Items	152	0	0		0	0	0		2,652	0	0		0	10,607
Residential Demand Response	Devices	19,550	98,388	171,733		10,947	49,038	93,076		24,870	359,408	390,303		0	774,582
Residential Demand Response (IHD)	Devices	0	49,689	133,657		0	0	0		0	0	0		0	0
Residential New Construction	Homes	26	19	86		0	2	18		743	17,152	163,690		20	381,811
Consumer Program Total						**49,681**	**72,377**	**116,886**		**133,520,941**	**75,796,859**	**70,049,807**		**85,506**	**900,058,189**
Business Program															
Retrofit	Projects	2,819	6,134	8,785		24,467	61,147	59,678		136,002,258	314,922,468	345,346,008		142,831	2,168,497,702
Direct Install Lighting	Projects	20,741	18,691	17,782		23,724	15,284	18,708		61,076,701	57,345,798	64,315,558		49,886	519,693,356
Building Commissioning	Buildings	0	0	0		0	0	0		0	0	0		0	0
New Construction	Buildings	22	69	86		123	764	1,584		411,717	1,814,721	4,959,266		2,472	17,009,564
Energy Audit	Audits	198	345	319		0	1,450	2,811		0	7,049,351	15,455,795		4,261	52,059,644
Small Commercial Demand Response	Devices	132	294	1,211		84	187	773		157	1,068	373		0	1,597
Small Commercial Demand Response (IHD)	Devices	0	0	378		0	0	0		0	0	0		0	0
Demand Response 3	Facilities	145	151	175		16,218	19,389	23,706		633,421	281,823	346,659		0	1,261,903
Business Program Total						**64,617**	**98,221**	**107,261**		**198,124,253**	**381,415,230**	**430,423,659**		**199,449**	**2,758,523,766**
Industrial Program															
Process & System Upgrades	Projects	0	0	3		0	0	294		0	0	2,603,764		294	5,207,528
Monitoring & Targeting	Projects	0	0	0		0	0	0		0	0	0		0	0
Energy Manager	Projects	0	42	205		0	1,086	3,558		0	7,372,108	21,994,263		3,194	54,888,570
Retrofit	Projects	433	0	0		4,615	0	0		28,866,840	0	0		4,613	115,462,282
Demand Response 3	Facilities	124	185	281		52,484	74,056	162,543		3,080,737	1,784,712	4,309,160		0	9,174,609
Industrial Program Total						**57,098**	**75,141**	**166,395**		**31,947,577**	**9,156,820**	**28,907,187**		**8,101**	**184,732,989**
Home Assistance Program															
Home Assistance Program	Homes	46	5,033	26,756		2	566	2,361		39,283	5,442,232	20,987,275		2,904	57,949,913
Home Assistance Program Total						**2**	**566**	**2,361**		**39,283**	**5,442,232**	**20,987,275**		**2,904**	**57,949,913**
Aboriginal Program															
Home Assistance Program	Homes	0	0	584		0	0	267		0	0	1,609,393		267	3,218,786
Direct Install Lighting	Projects	0	0	0		0	0	0		0	0	0		0	0
Aboriginal Program Total						**0**	**0**	**267**		**0**	**0**	**1,609,393**		**267**	**3,218,786**
Pre-2011 Programs completed in 2011															
Electricity Retrofit Incentive Program	Projects	2,028	0	0		21,662	0	0		121,138,219	0	0		21,662	484,552,876
High Performance New Construction	Projects	179	69	4		5,098	3,251	772		26,185,591	11,901,944	3,522,240		9,121	147,492,677
Toronto Comprehensive	Projects	577	0	0		15,805	0	0		86,964,886	0	0		15,805	347,859,545
Multifamily Energy Efficiency Rebates	Projects	110	0	0		1,981	0	0		7,595,683	0	0		1,981	30,382,733
LDC Custom Programs	Projects	8	0	0		399	0	0		1,367,170	0	0		399	5,468,679
Pre-2011 Programs completed in 2011 Total						**44,945**	**3,251**	**772**		**243,251,550**	**11,901,944**	**3,522,240**		**48,967**	**1,015,756,510**
Other															
Program Enabled Savings	Projects	14	56	13		0	2,304	3,692		0	1,188,362	4,075,382		5,996	11,715,850
Time-of-Use Savings	Homes	0	0	0		0	0	0		0	0	0		0	0
Other Total						**0**	**2,304**	**3,692**		**0**	**1,188,362**	**4,075,382**		**5,996**	**11,715,850**
Adjustments to 2011 Verified Results							**1,406**	**641**			**18,689,081**	**1,736,381**		**1,797**	**80,864,121**
Adjustments to 2012 Verified Results								**6,260**				**41,947,840**		**6,180**	**126,287,857**
Energy Efficiency Total						**136,610**	**109,191**	**117,536**		**603,144,419**	**482,474,435**	**554,528,447**		**351,190**	**4,920,743,312**
Demand Response Total (Scenario 1)						**79,733**	**142,670**	**280,099**		**3,739,185**	**2,427,011**	**5,046,495**		**0**	**11,212,691**
Adjustments to Previous Years' Verified Results Total						**0**	**1,406**	**6,901**		**0**	**18,689,081**	**43,684,221**		**7,976**	**207,151,978**
OPA-Contracted LDC Portfolio Total (inc. Adjustments)						**216,343**	**253,267**	**404,536**		**606,883,604**	**503,590,526**	**603,259,163**		**359,166**	**5,139,107,980**
													Full OEB Target:	**1,330,000**	**6,000,000,000**
													% of Full OEB Target Achieved to Date (Scenario 1):	**27.0%**	**85.7%**

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

*Includes adjustments after Final Reports were issued

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is made available.

Energy Manager, Aboriginal Program and Program Enabled Savings were not independently evaluated

Table 7: Adjustments to Province-Wide Net Verified Results due to Variances

Initiative	Unit	Incremental Activity (new program activity occurring within the specified reporting period)				Net Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Net Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)			
		2011*	2012*	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program													
Appliance Retirement	Appliances	0	0			0	0			0	0		
Appliance Exchange	Appliances	0	0			0	0			0	0		
HVAC Incentives	Equipment	-18,844	2,206			-5,271	452			-9,709,500	907,735		
Conservation Instant Coupon Booklet	Items	8,216	0			16	0			275,655	0		
Bi-Annual Retailer Event	Items	81,817	0			108	0			2,183,391	0		
Retailer Co-op	Items	0	0			0	0			0	0		
Residential Demand Response	Devices	0	0			0	0			0	0		
Residential Demand Response (IHD)	Devices	0	0			0	0			0	0		
Residential New Construction	Homes	19	0			1	0			13,767	0		
Consumer Program Total						**-5,146**	**452**			**-7,236,687**	**907,735**		
Business Program													
Retrofit	Projects	303	529			3,204	4,443			16,216,165	28,739,635		
Direct Install Lighting	Projects	444	197			501	204			1,250,388	736,541		
Building Commissioning	Buildings	0	0			0	0			0	0		
New Construction	Buildings	12	0			828	0			3,520,620	0		
Energy Audit	Audits	95	65			492	337			2,391,744	1,636,457		
Small Commercial Demand Response	Devices	0	0			0	0			0	0		
Small Commercial Demand Response (IHD)	Devices	0	0			0	0			0	0		
Demand Response 3	Facilities	0	0			0	0			0	0		
Business Program Total						**5,025**	**4,984**			**23,378,917**	**31,112,632**		
Industrial Program													
Process & System Upgrades	Projects	0	0			0	0			0	0		
Monitoring & Targeting	Projects	0	0			0	0			0	0		
Energy Manager	Projects	0	3			0	68			0	719,235		
Retrofit	Projects	0	0			0	0			0	0		
Demand Response 3	Facilities	0	0			0	0			0	0		
Industrial Program Total						**0**	**68**			**0**	**719,235**		
Home Assistance Program													
Home Assistance Program	Homes	0	0			0	0			0	0		
Home Assistance Program Total						**0**	**0**			**0**	**0**		
Aboriginal Program													
Home Assistance Program	Homes	0	0			0	0			0	0		
Direct Install Lighting	Projects	0	0			0	0			0	0		
Aboriginal Program Total						**0**	**0**			**0**	**0**		
Pre-2011 Programs completed in 2011													
Electricity Retrofit Incentive Program	Projects	12	0			138	0			545,536	0		
High Performance New Construction	Projects	34	0			1,407	0			2,065,200	0		
Toronto Comprehensive	Projects	0	0			0	0			0	0		
Multifamily Energy Efficiency Rebates	Projects	0	0			0	0			0	0		
LDC Custom Programs	Projects	0	0			0	0			0	0		
Pre-2011 Programs completed in 2011 Total						**1,545**	**0**			**2,610,736**	**0**		
Other													
Program Enabled Savings	Projects	14	40			624	824			1,673,712	9,927,473		
Time-of-Use Savings	Homes	0	0			0	0			0	0		
Other Total						**624**	**824**			**1,673,712**	**9,927,473**		
Adjustments to 2011 Verified Results						**2,047**				**20,426,678**			
Adjustments to 2012 Verified Results							**6,328**				**42,667,076**		
Adjustments to Previous Years' Verified Results Total						**2,047**	**6,328**			**20,426,678**	**42,667,076**		

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is made available.

Adjustments to previous years' results shown in this table will not align to adjustments shown in Table 1 as the information presented above does not consider persistence of savings

Table 8: Province-Wide Realization Rate & NTG

Initiative	Peak Demand Savings								Energy Savings							
	Realization Rate				Net-to-Gross Ratio				Realization Rate				Net-to-Gross Ratio			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program																
Appliance Retirement	1.00	1.00	1.00		0.51	0.46	0.42		1.00	1.00	1.00		0.46	0.47	0.44	
Appliance Exchange	1.00	1.00	1.00		0.51	0.52	0.53		1.00	1.00	1.00		0.52	0.52	0.53	
HVAC Incentives	1.00	1.00	1.00		0.60	0.50	0.48		1.00	1.00	1.00		0.50	0.49	0.48	
Conservation Instant Coupon Booklet	1.00	1.00	1.00		1.14	1.00	1.11		1.00	1.00	1.00		1.00	1.05	1.13	
Bi-Annual Retailer Event	1.00	1.00	1.00		1.12	0.91	1.04		1.00	1.00	1.00		0.91	0.92	1.04	
Retailer Co-op	1.00	n/a	n/a		0.68	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Residential Demand Response	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Residential Demand Response (IHD)	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Residential New Construction	1.00	3.65	0.78		0.41	0.49	0.63		3.65	7.17	3.09		0.49	0.49	0.63	
Business Program																
Retrofit	1.06	0.93	0.92		0.72	0.75	0.73		0.93	1.05	1.01		0.75	0.76	0.73	
Direct Install Lighting	1.08	0.69	0.82		1.08	0.94	0.94		0.69	0.85	0.84		0.94	0.94	0.94	
Building Commissioning	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
New Construction	0.50	0.98	0.68		0.50	0.49	0.54		0.98	0.99	0.76		0.49	0.49	0.54	
Energy Audit	n/a	n/a	1.02		n/a	n/a	0.66		n/a	n/a	0.97		n/a	n/a	0.66	
Small Commercial Demand Response	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Small Commercial Demand Response (IHD)	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Demand Response 3	0.76	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Industrial Program																
Process & System Upgrades	n/a	n/a	0.85		n/a	n/a	0.94		n/a	n/a	0.87		n/a	n/a	0.93	
Monitoring & Targeting	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Energy Manager	n/a	1.16	0.90		n/a	0.90	0.90		1.16	1.16	0.90		0.90	0.90	0.90	
Retrofit	1.11	n/a	n/a		0.72	n/a	n/a		0.91	n/a	n/a		0.75	n/a	n/a	
Demand Response 3	0.84	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Home Assistance Program																
Home Assistance Program	1.00	0.32	0.26		0.70	1.00	1.00		0.32	0.99	0.88		1.00	1.00	1.00	
Aboriginal Program																
Home Assistance Program	n/a	n/a	0.05		n/a	n/a	1.00		n/a	n/a	0.95		n/a	n/a	1.00	
Direct Install Lighting	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Pre-2011 Programs completed in 2011																
Electricity Retrofit Incentive Program	0.80	n/a	n/a		0.54	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
High Performance New Construction	1.00	1.00	1.00		0.49	0.50	0.50		1.00	1.00	1.00		0.50	0.50	0.50	
Toronto Comprehensive	1.13	n/a	n/a		0.50	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Multifamily Energy Efficiency Rebates	0.93	n/a	n/a		0.78	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
LDC Custom Programs	1.00	n/a	n/a		1.00	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	
Other																
Program Enabled Savings	n/a	1.06	1.00		n/a	1.00	1.00		1.06	2.26	1.00		1.00	1.00	1.00	
Time-of-Use Savings	n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a		n/a	n/a	n/a	

Energy Manager, Aboriginal Program and Program Enabled Savings were not independently evaluated

Summary Provincial Progress Towards CDM Targets

Table 9: Province-Wide Net Peak Demand Savings at the End User Level (MW)

Implementation Period	Annual			
	2011	2012	2013	2014
2011	216.3	136.6	135.8	129.0
2012†	1.4	253.3	109.8	108.2
2013†	0.6	7.0	404.5	122.0
2014				
Verified Net Annual Peak Demand Savings in 2014:				359.2
2014 Annual CDM Capacity Target:				1,330
Verified Portion of Peak Demand Savings Target Achieved in 2014 (%):				27.0%

Table 10: Province-Wide Net Energy Savings at the End-User Level (GWh)

Implementation Period	Annual				Cumulative
	2011	2012	2013	2014	2011-2014
2011	606.9	603.0	601.0	582.3	2,393.1
2012†	18.7	503.6	498.4	492.6	1,513.3
2013†	1.7	44.4	603.3	583.4	1,232.8
2014					
Verified Net Cumulative Energy Savings 2011-2014:					5,139.1
2011-2014 Cumulative CDM Energy Target:					6,000
Verified Portion of Cumulative Energy Target Achieved in 2014 (%):					85.7%

†Includes adjustments to previous Years' verified results

METHODOLOGY

All results are at the end-user level (not including transmission and distribution losses)

EQUATIONS	
Prescriptive Measures and Projects	**Gross Savings = Activity * Per Unit Assumption** **Net Savings = Gross Savings * Net-to-Gross Ratio** **All savings are annualized (i.e. the savings are the same regardless of time of year a project was completed or measure installed)**
Engineered and Custom Projects	**Gross Savings = Reported Savings * Realization Rate** **Net Savings = Gross Savings * Net-to-Gross Ratio** **All savings are annualized (i.e. the savings are the same regardless of time of year a project was completed or measure installed)**
Demand Response	**Peak Demand: Gross Savings = Net Savings = contracted MW at contributor level * Provincial contracted to ex ante ratio** **Energy: Gross Savings = Net Savings = provincial ex post energy savings * LDC proportion of total provincial contracted MW** **All savings are annualized (i.e. the savings are the same regardless of the time of year a participant began offering DR)**
Adjustments to Previous Years' Verified Results	All variances from the Final Annual Results Reports from prior years will be adjusted within this report. Any variances with regards to projects counts, data lag, and calculations etc., will be made within this report. Considers the cumulative effect of energy savings.

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Consumer Program			
Appliance Retirement	Includes both retail and home pickup stream; Retail stream allocated based on average of 2008 & 2009 residential throughput; Home pickup stream directly attributed by postal code or customer selection.	Savings are considered to begin in the year the appliance is picked up.	Peak demand and energy savings are determined using the verified measure level per unit assumption multiplied by the uptake in the market (gross) taking into account net-to-gross factors such as free-ridership and spillover (net) at the measure level.
Appliance Exchange	When postal code information is provided by customer, results are directly attributed to the LDC. When postal code is not available, results allocated based on average of 2008 & 2009 residential throughput.	Savings are considered to begin in the year that the exchange event occurred.	
HVAC Incentives	Results directly attributed to LDC based on customer postal code.	Savings are considered to begin in the year that the installation occurred.	

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Conservation Instant Coupon Booklet	LDC-coded coupons directly attributed to LDC; Otherwise results are allocated based on average of 2008 & 2009 residential throughput.	Savings are considered to begin in the year in which the coupon was redeemed.	Peak demand and energy savings are determined using the verified measure level per unit assumption multiplied by the uptake in the market (gross) taking into account net-to-gross factors such as free-ridership and spillover (net) at the measure level.
Bi-Annual Retailer Event	Results are allocated based on average of 2008 & 2009 residential throughput.	Savings are considered to begin in the year in which the event occurs.	
Retailer Co-op	When postal code information is provided by the customer, results are directly attributed. If postal code information is not available, results are allocated based on average of 2008 & 2009 residential throughput.	Savings are considered to begin in the year of the home visit and installation date.	Peak demand and energy savings are determined using the verified measure level per unit assumption multiplied by the uptake in the market (gross) taking into account net-to-gross factors such as free-ridership and spillover (net) at the measure level.
Residential Demand Response	Results are directly attributed to LDC based on data provided to OPA through project completion reports and continuing participant lists.	Savings are considered to begin in the year the device was installed and/or when a customer signed a peaksaver PLUS™ participant agreement.	Peak demand savings are based on an ex ante estimate assuming a 1 in 10 weather year and represents the "insurance value" of the initiative. Energy savings are based on an ex post estimate which reflects the savings that occurred as a result of activations in the year and accounts for any “snapback” in energy consumption experienced after the event. Savings are assumed to persist for only 1 year, reflecting that savings will only occur if the resource is activated.

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Residential New Construction	Results are directly attributed to LDC based on LDC identified in application in the saveONenergy CRM system; Initiative was not evaluated in 2011, reported results are presented with forecast assumptions as per the business case.	Savings are considered to begin in the year of the project completion date.	Peak demand and energy savings are determined using the verified measure level per unit assumption multiplied by the uptake in the market (gross) taking into account net-to-gross factors such as free-ridership and spillover (net) at the measure level.
Business Program			
Efficiency: Equipment Replacement	Results are directly attributed to LDC based on LDC identified at the facility level in the saveONenergy CRM; Projects in the Application Status: "Post-Stage Submission" are included (excluding "Payment denied by LDC"); Please see page for Building type to Sector mapping.	Savings are considered to begin in the year of the actual project completion date on the iCON CRM system.	Peak demand and energy savings are determined by the total savings for a given project as reported in the iCON CRM system (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net). Both realization rate and net-to-gross ratios can differ for energy and demand savings and depend on the mix of projects within an LDC territory (i.e. lighting or non-lighting project, engineered/custom/prescriptive track).
	Additional Note: project counts were derived by filtering out invalid statuses (e.g. Post-Project Submission - Payment denied by LDC) and only including projects with an "Actual Project Completion Date" in 2013)		

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Direct Installed Lighting	Results are directly attributed to LDC based on the LDC specified on the work order.	Savings are considered to begin in the year of the actual project completion date.	Peak demand and energy savings are determined using the verified measure level per unit assumptions multiplied by the uptake of each measure accounting for the realization rate for both peak demand and energy to reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings take into account net-to-gross factors such as free-ridership and spillover for both peak demand and energy savings at the program level (net).
Existing Building Commissioning Incentive	Results are directly attributed to LDC based on LDC identified in the application; Initiative was not evaluated, no completed projects in 2011 or 2012.	Savings are considered to begin in the year of the actual project completion date.	Peak demand and energy savings are determined by the total savings for a given project as reported (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net).
New Construction and Major Renovation Incentive	Results are directly attributed to LDC based on LDC identified in the application.	Savings are considered to begin in the year of the actual project completion date.	
Energy Audit	Projects are directly attributed to LDC based on LDC identified in the application.	Savings are considered to begin in the year of the audit date.	Peak demand and energy savings are determined by the total savings resulting from an audit as reported (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net).

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Commercial Demand Response (part of the Residential program schedule)	Results are directly attributed to LDC based on data provided to OPA through project completion reports and continuing participant lists	Savings are considered to begin in the year the device was installed and/or when a customer signed a peaksaver PLUS™ participant agreement.	Peak demand savings are based on an ex ante estimate assuming a 1 in 10 weather year and represents the "insurance value" of the initiative. Energy savings are based on an ex post estimate which reflects the savings that occurred as a result of activations in the year. Savings are assumed to persist for only 1 year, reflecting that savings will only occur if the resource is activated.
Demand Response 3 (part of the Industrial program schedule)	Results are attributed to LDCs based on the total contracted megawatts at the contributor level as of December 31st, applying the provincial ex ante to contracted ratio (ex ante estimate/contracted megawatts); Ex post energy savings are attributed to the LDC based on their proportion of the total contracted megawatts at the contributor level.	Savings are considered to begin in the year in which the contributor signed up to participate in demand response.	Peak demand savings are ex ante estimates based on the load reduction capability that can be expected for the purposes of planning. The ex ante estimates factor in both scheduled non-performances (i.e. maintenance) and historical performance. Energy savings are based on an ex post estimate which reflects the savings that actually occurred as a results of activations in the year. Savings are assumed to persist for 1 year, reflecting that savings will not occur if the resource is not activated and additional costs are incurred to activate the resource.
Industrial Program			
Process & System Upgrades	Results are directly attributed to LDC based on LDC identified in application.	Savings are considered to begin in the year in which the incentive project was completed.	Peak demand and energy savings are determined by the total savings from a given project as reported (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net).

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Monitoring & Targeting	Results are directly attributed to LDC based on LDC identified in the application; Initiative was not evaluated, no completed projects in 2011, 2012 or 2013.	Savings are considered to begin in the year in which the incentive project was completed.	Peak demand and energy savings are determined by the total savings from a given project as reported (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net).
Energy Manager	Results are directly attributed to LDC based on LDC identified in the application.	Savings are considered to begin in the year in which the project was completed by the energy manager. If no date is specified the savings will begin the year of the Quarterly Report submitted by the energy manager.	Peak demand and energy savings are determined by the total savings from a given project as reported (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net).

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Efficiency: Equipment Replacement Incentive (part of the C&I program schedule)	Results are directly attributed to LDC based on LDC identified at the facility level in the saveONenergy CRM; Projects in the Application Status: "Post-Stage Submission" are included (excluding "Payment denied by LDC"); Please see "Reference Tables" tab for Building type to Sector mapping.	Savings are considered to begin in the year of the actual project completion date on the iCON CRM system.	Peak demand and energy savings are determined by the total savings for a given project as reported in the iCON CRM system (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net). Both realization rate and net-to-gross ratios can differ for energy and demand savings and depend on the mix of projects within an LDC territory (i.e. lighting or non-lighting project, engineered/custom/prescriptive track).
Demand Response 3	Results are attributed to LDCs based on the total contracted megawatts at the contributor level as of December 31st, applying the provincial ex ante to contracted ratio (ex ante estimate/contracted megawatts); Ex post energy savings are attributed to the LDC based on their proportion of the total contracted megawatts at the contributor level.	Savings are considered to begin in the year in which the contributor signed up to participate in demand response.	Peak demand savings are ex ante estimates based on the load reduction capability that can be expected for the purposes of planning. The ex ante estimates factor in both scheduled non-performances (i.e. maintenance) and historical performance. Energy savings are based on an ex post estimate which reflects the savings that actually occurred as a results of activations in the year. Savings are assumed to persist for 1 year, reflecting that savings will not occur if the resource is not activated and additional costs are incurred to activate the resource.

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Home Assistance Program			
Home Assistance Program	Results are directly attributed to LDC based on LDC identified in the application.	Savings are considered to begin in the year in which the measures were installed.	Peak demand and energy savings are determined using the measure level per unit assumption multiplied by the uptake of each measure (gross), taking into account net-to-gross factors such as free-ridership and spillover (net) at the measure level.
Aboriginal Program			
Aboriginal Program	Results are directly attributed to LDC based on LDC identified in the application.	Savings are considered to begin in the year in which the measures were installed.	Peak demand and energy savings are determined using the measure level per unit assumption multiplied by the uptake of each measure (gross), taking into account net-to-gross factors such as free-ridership and spillover (net) at the measure level.

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Pre-2011 Programs completed in 2011			
Electricity Retrofit Incentive Program	Results are directly attributed to LDC based on LDC identified in the application; Initiative was not evaluated in 2011, 2012 or 2013 assumptions as per 2010 evaluation.	Savings are considered to begin in the year in which a project was completed.	Peak demand and energy savings are determined by the total savings from a given project as reported. A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net). If energy savings are not available, an estimate is made based on the kWh to kW ratio in the provincial results from the 2010 evaluated results (http://www.powerauthority.on.ca/evaluation-measurement-and-verification/evaluation-reports).
High Performance New Construction	Results are directly attributed to LDC based on customer data provided to the OPA from Enbridge; Initiative was not evaluated in 2011, 2012 or 2013, assumptions as per 2010 evaluation.	Savings are considered to begin in the year in which a project was completed.	
Toronto Comprehensive	Program run exclusively in Toronto Hydro-Electric System Limited service territory; Initiative was not evaluated in 2011, 2012 or 2013, assumptions as per 2010 evaluation.		

Initiative	Attributing Savings to LDCs	Savings 'start' Date	Calculating Resource Savings
Multifamily Energy Efficiency Rebates	Results are directly attributed to LDC based on LDC identified in the application; Initiative was not evaluated in 2011, 2012 or 2013, assumptions as per 2010 evaluation.	Savings are considered to begin in the year in which a project was completed.	Peak demand and energy savings are determined by the total savings from a given project as reported (reported). A realization rate is applied to the reported savings to ensure that these savings align with EM&V protocols and reflect the savings that were actually realized (i.e. how many light bulbs were actually installed vs. what was reported) (gross). Net savings takes into account net-to-gross factors such as free-ridership and spillover (net). If energy savings are not available, an estimate is made based on the kWh to kW ratio in the provincial results from the 2010 evaluated results (http://www.powerauthority.on.ca/evaluation-measurement-and-verification/evaluation-reports).
Data Centre Incentive Program	Program run exclusively in PowerStream Inc. service territory; Initiative was not evaluated in 2011, assumptions as per 2009 evaluation.		
EnWin Green Suites	Program run exclusively in ENWIN Utilities Ltd. service territory; Initiative was not evaluated in 2011 or 2012, assumptions as per 2010 evaluation.		

Retrofit Sector (C&I vs. Industrial Mapping)	
Building Type	**Sector**
Agribusiness - Cattle Farm	C&I
Agribusiness - Dairy Farm	C&I
Agribusiness - Greenhouse	C&I
Agribusiness - Other	C&I
Agribusiness - Other,Mixed-Use - Office/Retail	C&I
Agribusiness - Other,Office,Retail,Warehouse	C&I
Agribusiness - Other,Office,Warehouse	C&I
Agribusiness - Poultry	C&I
Agribusiness - Poultry,Hospitality - Motel	C&I
Agribusiness - Swine	C&I
Convenience Store	C&I
Education - College / Trade School	C&I
Education - College / Trade School,Multi-Residential - Condominium	C&I
Education - College / Trade School,Multi-Residential - Rental Apartment	C&I
Education - College / Trade School,Retail	C&I
Education - Primary School	C&I
Education - Primary School,Education - Secondary School	C&I
Education - Primary School,Multi-Residential - Rental Apartment	C&I
Education - Primary School,Not-for-Profit	C&I
Education - Secondary School	C&I
Education - University	C&I
Education - University,Office	C&I
Hospital/Healthcare - Clinic	C&I
Hospital/Healthcare - Clinic,Hospital/Healthcare - Long-term Care,Hospital/Healthcare - Medical Building	C&I
Hospital/Healthcare - Clinic,Industrial	C&I
Hospital/Healthcare - Clinic,Retail	C&I
Hospital/Healthcare - Long-term Care	C&I
Hospital/Healthcare - Long-term Care,Hospital/Healthcare - Medical Building	C&I
Hospital/Healthcare - Medical Building	C&I
Hospital/Healthcare - Medical Building,Mixed-Use - Office/Retail	C&I
Hospital/Healthcare - Medical Building,Mixed-Use - Office/Retail,Office	C&I
Hospitality - Hotel	C&I
Hospitality - Hotel,Restaurant - Dining	C&I
Hospitality - Motel	C&I
Industrial	Industrial
Mixed-Use - Office/Retail	C&I
Mixed-Use - Office/Retail,Industrial	Industrial
Mixed-Use - Office/Retail,Mixed-Use - Other	C&I
Mixed-Use - Office/Retail,Mixed-Use - Other,Not-for-Profit,Warehouse	C&I
Mixed-Use - Office/Retail,Mixed-Use - Residential/Retail	C&I
Mixed-Use - Office/Retail,Office,Restaurant - Dining,Restaurant - Quick Serve,Retail,Warehouse	C&I

Mixed-Use - Office/Retail,Office,Warehouse	C&I
Mixed-Use - Office/Retail,Retail	C&I
Mixed-Use - Office/Retail,Warehouse	C&I
Mixed-Use - Office/Retail,Warehouse,Industrial	Industrial
Mixed-Use - Other	C&I
Mixed-Use - Other,Industrial	Industrial
Mixed-Use - Other,Not-for-Profit,Office	C&I
Mixed-Use - Other,Office	C&I
Mixed-Use - Other,Other: Please specify	C&I
Mixed-Use - Other,Retail,Warehouse	C&I
Mixed-Use - Other,Warehouse	C&I
Mixed-Use - Residential/Retail	C&I
Mixed-Use - Residential/Retail,Multi-Residential - Condominium	C&I
Mixed-Use - Residential/Retail,Multi-Residential - Rental Apartment	C&I
Mixed-Use - Residential/Retail,Retail	C&I
Multi-Residential - Condominium	C&I
Multi-Residential - Condominium,Multi-Residential - Rental Apartment	C&I
Multi-Residential - Condominium,Other: Please specify	C&I
Multi-Residential - Rental Apartment	C&I
Multi-Residential - Rental Apartment,Multi-Residential - Social Housing Provider,Not-for-Profit	C&I
Multi-Residential - Rental Apartment,Not-for-Profit	C&I
Multi-Residential - Rental Apartment,Warehouse	C&I
Multi-Residential - Social Housing Provider	C&I
Multi-Residential - Social Housing Provider,Industrial	C&I
Multi-Residential - Social Housing Provider,Not-for-Profit	C&I
Not-for-Profit	C&I
Not-for-Profit,Office	C&I
Not-for-Profit,Other: Please specify	C&I
Not-for-Profit,Warehouse	C&I
Office	C&I
Office,Industrial	Industrial
Office,Other: Please specify	C&I
Office,Other: Please specify,Warehouse	C&I
Office,Restaurant - Dining	C&I
Office,Restaurant - Dining,Industrial	Industrial
Office,Retail	C&I
Office,Retail,Industrial	C&I
Office,Retail,Warehouse	C&I
Office,Warehouse	C&I
Office,Warehouse,Industrial	Industrial
Other: Please specify	C&I
Other: Please specify,Industrial	Industrial
Other: Please specify,Retail	C&I
Other: Please specify,Warehouse	C&I
Restaurant - Dining	C&I
Restaurant - Dining,Retail	C&I

Restaurant - Quick Serve	C&I
Restaurant - Quick Serve,Retail	C&I
Retail	C&I
Retail,Industrial	Industrial
Retail,Warehouse	C&I
Warehouse	C&I
Warehouse,Industrial	Industrial

Consumer Program Allocation Methodology

Results can be allocated based on average of 2008 & 2009 residential throughput for each LDC (below) when additional information is not available. Source: OEB Yearbook Data 2008 & 2009

Local Distribution Company	Allocation
Algoma Power Inc.	0.2%
Atikokan Hydro Inc.	0.0%
Attawapiskat Power Corporation	0.0%
Bluewater Power Distribution Corporation	0.6%
Brant County Power Inc.	0.2%
Brantford Power Inc.	0.7%
Burlington Hydro Inc.	1.4%
Cambridge and North Dumfries Hydro Inc.	1.0%
Canadian Niagara Power Inc.	0.5%
Centre Wellington Hydro Ltd.	0.1%
Chapleau Public Utilities Corporation	0.0%
COLLUS Power Corporation	0.3%
Cooperative Hydro Embrun Inc.	0.0%
E.L.K. Energy Inc.	0.2%
Enersource Hydro Mississauga Inc.	3.9%
ENTEGRUS	0.6%
ENWIN Utilities Ltd.	1.6%
Erie Thames Powerlines Corporation	0.4%
Espanola Regional Hydro Distribution Corporation	0.1%
Essex Powerlines Corporation	0.7%
Festival Hydro Inc.	0.3%
Fort Albany Power Corporation	0.0%
Fort Frances Power Corporation	0.1%
Greater Sudbury Hydro Inc.	1.0%
Grimsby Power Inc.	0.2%
Guelph Hydro Electric Systems Inc.	0.9%
Haldimand County Hydro Inc.	0.4%
Halton Hills Hydro Inc.	0.5%
Hearst Power Distribution Company Limited	0.1%
Horizon Utilities Corporation	4.0%
Hydro 2000 Inc.	0.0%
Hydro Hawkesbury Inc.	0.1%
Hydro One Brampton Networks Inc.	2.8%
Hydro One Networks Inc.	30.0%

Hydro Ottawa Limited	5.6%
Innisfil Hydro Distribution Systems Limited	0.4%
Kashechewan Power Corporation	0.0%
Kenora Hydro Electric Corporation Ltd.	0.1%
Kingston Hydro Corporation	0.5%
Kitchener-Wilmot Hydro Inc.	1.6%
Lakefront Utilities Inc.	0.2%
Lakeland Power Distribution Ltd.	0.2%
London Hydro Inc.	2.7%
Middlesex Power Distribution Corporation	0.1%
Midland Power Utility Corporation	0.1%
Milton Hydro Distribution Inc.	0.6%
Newmarket - Tay Power Distribution Ltd.	0.7%
Niagara Peninsula Energy Inc.	1.0%
Niagara-on-the-Lake Hydro Inc.	0.2%
Norfolk Power Distribution Inc.	0.3%
North Bay Hydro Distribution Limited	0.5%
Northern Ontario Wires Inc.	0.1%
Oakville Hydro Electricity Distribution Inc.	1.5%
Orangeville Hydro Limited	0.2%
Orillia Power Distribution Corporation	0.3%
Oshawa PUC Networks Inc.	1.2%
Ottawa River Power Corporation	0.2%
Parry Sound Power Corporation	0.1%
Peterborough Distribution Incorporated	0.7%
PowerStream Inc.	6.6%
PUC Distribution Inc.	0.9%
Renfrew Hydro Inc.	0.1%
Rideau St. Lawrence Distribution Inc.	0.1%
Sioux Lookout Hydro Inc.	0.1%
St. Thomas Energy Inc.	0.3%
Thunder Bay Hydro Electricity Distribution Inc.	0.9%
Tillsonburg Hydro Inc.	0.1%
Toronto Hydro-Electric System Limited	12.8%
Veridian Connections Inc.	2.4%
Wasaga Distribution Inc.	0.2%
Waterloo North Hydro Inc.	1.0%
Welland Hydro-Electric System Corp.	0.4%
Wellington North Power Inc.	0.1%
West Coast Huron Energy Inc.	0.1%
Westario Power Inc.	0.5%
Whitby Hydro Electric Corporation	0.9%
Woodstock Hydro Services Inc.	0.3%

Reporting Glossary

Annual: the peak demand or energy savings that occur in a given year (includes resource savings from new program activity in a given year and resource savings persisting from previous years).

Cumulative Energy Savings: represents the sum of the annual energy savings that accrue over a defined period (in the context of this report the defined period is 2011 - 2014). This concept does not apply to peak demand savings.

End-User Level: resource savings in this report are measured at the customer level as opposed to the generator level (the difference being line losses).

Free-ridership: the percentage of participants who would have implemented the program measure or practice in the absence of the program.

Incremental: the new resource savings attributable to activity procured in a particular reporting period based on when the savings are considered to 'start'.

Initiative: a Conservation & Demand Management offering focusing on a particular opportunity or customer end-use (i.e. Retrofit, Fridge & Freezer Pickup).

Net-to-Gross Ratio: The ratio of net savings to gross savings, which takes into account factors such as free-ridership and spillover

Net Energy Savings (MWh): energy savings attributable to conservation and demand management activities net of free-riders, etc.

Net Peak Demand Savings (MW): peak demand savings attributable to conservation and demand management activities net of free-riders, etc.

Program: a group of initiatives that target a particular market sector (e.g. Consumer, Industrial).

Realization Rate: A comparison of observed or measured (evaluated) information to original reported savings which is used to adjust the gross savings estimates.

Settlement Account: the grouping of demand response facilities (contributors) into one contractual agreement

Spillover: Reductions in energy consumption and/or demand caused by the presence of the energy efficiency program, beyond the program-related gross savings of the participants. There can be participant and/or non-participant spillover.

Unit: for a specific initiative the relevant type of activity acquired in the market place (i.e. appliances picked up, projects completed, coupons redeemed).

Table 11: London Hydro Inc. Initiative and Program Level Gross Savings by Year

Initiative	Unit	Gross Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Gross Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)			
		2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program									
Appliance Retirement**	Appliances	350	179	415		1,967,720	855,873	1,577,135	
Appliance Exchange**	Appliances	24	10	43		30,871	17,215	75,807	
HVAC Incentives	Equipment	1,739	1,304	1,211		3,173,112	2,236,842	2,075,157	
Conservation Instant Coupon Booklet	Items	28	6	13		465,107	36,208	186,850	
Bi-Annual Retailer Event	Items	41	44	31		734,572	798,004	448,984	
Retailer Co-op	Items	0	0	0		0	0	0	
Residential Demand Response	Devices	0	0	0		0	0	0	
Residential Demand Response (IHD)	Devices	0	0	0		0	0	0	
Residential New Construction	Homes	0	0	0		0	0	0	
Consumer Program Total		**2,182**	**1,543**	**1,713**		**6,371,383**	**3,944,142**	**4,363,933**	
Business Program									
Retrofit	Projects	1,408	2,596	2,510		7,035,154	11,974,267	11,542,947	
Direct Install Lighting	Projects	52	81	177		157,160	274,518	665,441	
Building Commissioning	Buildings	0	0	0		0	0	0	
New Construction	Buildings	0	10	11		0	26,314	16,992	
Energy Audit	Audits	0	0	228		0	0	1,246,282	
Small Commercial Demand Response	Devices	0	0	0		0	0	0	
Small Commercial Demand Response (IHD)	Devices	0	0	0		0	0	0	
Demand Response 3	Facilities	487	533	547		19,012	7,751	8,163	
Business Program Total		**1,948**	**3,221**	**3,473**		**7,211,326**	**12,282,850**	**13,479,824**	
Industrial Program									
Process & System Upgrades	Projects	0	0	0		0	0	0	
Monitoring & Targeting	Projects	0	0	0		0	0	0	
Energy Manager	Projects	0	3	303		0	73,423	2,412,355	
Retrofit	Projects	172	0	0		986,857	0	0	
Demand Response 3	Facilities	2,137	994	1,905		125,454	23,964	43,378	
Industrial Program Total		**2,309**	**998**	**2,208**		**1,112,311**	**97,387**	**2,455,733**	
Home Assistance Program									
Home Assistance Program	Homes	0	26	42		0	304,467	427,264	
Home Assistance Program Total		**0**	**26**	**42**		**0**	**304,467**	**427,264**	
Aboriginal Program									
Home Assistance Program	Homes	0	0	0		0	0	0	
Direct Install Lighting	Projects	0	0	0		0	0	0	
Aboriginal Program Total		**0**	**0**	**0**		**0**	**0**	**0**	
Pre-2011 Programs completed in 2011									
Electricity Retrofit Incentive Program	Projects	2,288	0	0		16,207,519	0	0	
High Performance New Construction	Projects	337	190	0		1,731,809	546,208	0	
Toronto Comprehensive	Projects	0	0	0		0	0	0	
Multifamily Energy Efficiency Rebates	Projects	0	0	0		0	0	0	
LDC Custom Programs	Projects	0	0	0		0	0	0	
Pre-2011 Programs completed in 2011 Total		**2,625**	**190**	**0**		**17,939,328**	**546,208**	**0**	
Other									
Program Enabled Savings	Projects	0	0	0		0	0	0	
Time-of-Use Savings	Homes	0	0	0		0	0	0	
Other Total		**0**	**0**	**0**		**0**	**0**	**0**	
Adjustments to 2011 Verified Results		**0**	**254**	**0**		**0**	**739,195**	**0**	
Adjustments to 2012 Verified Results		**0**	**0**	**249**		**0**	**0**	**987,313**	
Energy Efficiency Total		**6,440**	**4,450**	**4,984**		**32,489,882**	**17,143,339**	**20,675,213**	
Demand Response Total		**2,624**	**1,528**	**2,452**		**144,465**	**31,715**	**51,541**	
Adjustments to Previous Years' Verified Results Total		**0**	**254**	**249**		**0**	**739,195**	**987,313**	
OPA-Contracted LDC Portfolio Total (inc. Adjustments)		**9,064**	**6,231**	**7,685**		**32,634,347**	**17,914,249**	**21,714,068**	

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is made available.

Adjustments to previous years' results shown in this table will not align to adjustments shown in Table 1 as the information presented above does not consider persistence of savings

Gross results are presented for informational purposes only and are not considered official 2013 Final Verified Results

**Net results substituted for gross results due to unavailability of data

Table 12: Adjustments to London Hydro Inc. Gross Verified Results due to Variances

Initiative	Unit	Gross Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Gross Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)			
		2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program									
Appliance Retirement	Appliances	0	0			0	0		
Appliance Exchange	Appliances	0	0			0	0		
HVAC Incentives	Equipment	-226	16			-408,659	28,053		
Conservation Instant Coupon Booklet	Items	0	0			6,990	0		
Bi-Annual Retailer Event	Items	3	0			64,819	0		
Retailer Co-op	Items	0	0			0	0		
Residential Demand Response	Devices	0	0			0	0		
Residential Demand Response (IHD)	Devices	0	0			0	0		
Residential New Construction	Homes	0	0			0	0		
Consumer Program Total		**-223**	**16**			**-336,850**	**28,053**		
Business Program									
Retrofit	Projects	76	221			394,879	908,813		
Direct Install Lighting	Projects	10	7			25,101	25,272		
Building Commissioning	Buildings	0	0			0	0		
New Construction	Buildings	10	0			26,314	0		
Energy Audit	Audits	47	5			226,586	25,176		
Small Commercial Demand Response	Devices	0	0			0	0		
Small Commercial Demand Response (IHD)	Devices	0	0			0	0		
Demand Response 3	Facilities	0	0			0	0		
Business Program Total		**143**	**233**			**672,881**	**959,261**		
Industrial Program									
Process & System Upgrades	Projects	0	0			0	0		
Monitoring & Targeting	Projects	0	0			0	0		
Energy Manager	Projects	0	75			0	799,151		
Retrofit	Projects	0	0			0	0		
Demand Response 3	Facilities	0	0			0	0		
Industrial Program Total		**0**	**75**			**0**	**799,151**		
Home Assistance Program									
Home Assistance Program	Homes	0	0			0	0		
Home Assistance Program Total		**0**	**0**			**0**	**0**		
Aboriginal Program									
Home Assistance Program	Homes	0	0			0	0		
Direct Install Lighting	Projects	0	0			0	0		
Aboriginal Program Total									
Pre-2011 Programs completed in 2011									
Electricity Retrofit Incentive Program	Projects	0	0			0	0		
High Performance New Construction	Projects	334	0			403,164	0		
Toronto Comprehensive	Projects	0	0			0	0		
Multifamily Energy Efficiency Rebates	Projects	0	0			0	0		
LDC Custom Programs	Projects	0	0			0	0		
Pre-2011 Programs completed in 2011 Total		**334**	**0**			**403,164**	**0**		
Other									
Program Enabled Savings	Projects	0	0			0	0		
Time-of-Use Savings	Homes	0	0			0	0		
Other Total		**0**	**0**			**0**	**0**		
Adjustments to 2011 Verified Results		**254**				**739,195**			
Adjustments to 2012 Verified Results			**325**				**1,786,464**		
Total Adjustments to Previous Years' Verified Results		**254**	**325**			**739,195**	**1,786,464**		

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is made available.

Gross results are presented for informational purposes only and are not considered official 2013 Final Verified Results

Table 13: Province-Wide Initiatives and Program Level Gross Savings by Year

Initiative	Unit	Gross Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Gross Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)			
		2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program									
Appliance Retirement**	Appliances	6,750	2,011	3,151		45,971,627	13,424,518	18,616,239	
Appliance Exchange**	Appliances	719	556	2,101		873,531	974,621	3,746,106	
HVAC Incentives	Equipment	53,209	38,346	40,418		99,413,430	66,929,213	71,225,037	
Conservation Instant Coupon Booklet	Items	1,184	231	464		19,192,453	1,325,898	6,842,244	
Bi-Annual Retailer Event	Items	1,504	1,622	1,142		26,899,265	29,222,072	16,441,329	
Retailer Co-op	Items	0	0	0		3,917	0	0	
Residential Demand Response	Devices	10,390	49,038	93,076		23,597	359,408	390,303	
Residential Demand Response (IHD)	Devices	0	0	0		0	0	0	
Residential New Construction	Homes	0	1	29		1,813	4,884	259,826	
Consumer Program Total		**73,757**	**91,805**	**140,380**		**192,379,633**	**112,240,615**	**117,521,084**	
Business Program									
Retrofit	Projects	34,201	78,965	82,896		184,070,265	387,817,248	478,410,896	
Direct Install Lighting	Projects	22,155	20,469	19,807		65,777,197	68,896,046	68,140,249	
Building Commissioning	Buildings	0	0	0		0	0	0	
New Construction	Buildings	247	1,596	2,934		823,434	3,755,869	9,183,826	
Energy Audit	Audits	0	1,450	4,283		0	7,049,351	23,386,108	
Small Commercial Demand Response	Devices	55	187	773		131	1,068	373	
Small Commercial Demand Response (IHD)	Devices	0	0	0		0	0	0	
Demand Response 3	Facilities	21,390	19,389	23,706		633,421	281,823	346,659	
Business Program Total		**78,048**	**122,056**	**134,399**		**251,304,448**	**467,801,406**	**579,468,111**	
Industrial Program									
Process & System Upgrades	Projects	0	0	313		0	0	2,799,746	
Monitoring & Targeting	Projects	0	0	0		0	0	0	
Energy Manager	Projects	0	1,034	3,953		0	7,067,535	24,438,070	
Retrofit	Projects	6,372	0	0		38,412,408	0	0	
Demand Response 3	Facilities	176,180	74,056	162,543		4,243,958	1,784,712	4,309,160	
Industrial Program Total		**182,552**	**75,090**	**166,809**		**42,656,366**	**8,852,247**	**31,546,976**	
Home Assistance Program									
Home Assistance Program	Homes	4	1,777	2,361		56,119	5,524,230	20,987,275	
Home Assistance Program Total		**4**	**1,777**	**2,361**		**56,119**	**5,524,230**	**20,987,275**	
Aboriginal Program									
Home Assistance Program	Homes	0	0	267		0	0	1,609,393	
Direct Install Lighting	Projects	0	0	0		0	0	0	
Aboriginal Program Total		**0**	**0**	**267**		**0**	**0**	**1,609,393**	
Pre-2011 Programs completed in 2011									
Electricity Retrofit Incentive Program	Projects	40,418	0	0		223,956,390	0	0	
High Performance New Construction	Projects	10,197	6,501	772		52,371,183	23,803,888	3,522,240	
Toronto Comprehensive	Projects	33,467	0	0		174,070,574	0	0	
Multifamily Energy Efficiency Rebates	Projects	2,553	0	0		9,774,792	0	0	
LDC Custom Programs	Projects	534	0	0		649,140	0	0	
Pre-2011 Programs completed in 2011 Total		**87,169**	**6,501**	**772**		**460,822,079**	**23,803,888**	**3,522,240**	
Other									
Program Enabled Savings	Projects	0	2,177	3,692		0	525,011	4,075,382	
Time-of-Use Savings	Homes	0	0	0		0	0	0	
Other Total		**0**	**2,177**	**3,692**		**0**	**525,011**	**4,075,382**	
Adjustments to 2011 Verified Results			**13,266**	**645**			**48,705,294**	**1,744,645**	
Adjustments to 2012 Verified Results				**8,707**				**55,101,043**	
Energy Efficiency Total		**213,515**	**156,735**	**168,583**		**942,317,539**	**616,320,385**	**753,683,966**	
Demand Response Total		**208,015**	**142,670**	**280,099**		**4,901,107**	**2,427,011**	**5,046,495**	
Adjustments to Previous Years' Verified Results Total		**0**	**13,266**	**9,352**		**0**	**48,705,294**	**56,845,688**	
OPA-Contracted LDC Portfolio Total (inc. Adjustments)		**421,530**	**312,671**	**458,033**		**947,218,646**	**667,452,690**	**815,576,149**	

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is

Adjustments to previous years' results shown in this table will not align to adjustments shown in Table 1 as the information presented above does not consider persistence of savings

Gross results are presented for informational purposes only and are not considered official 2013 Final Verified Results

**Net results substituted for gross results due to unavailability of data

Table 14: Adjustments to Province-Wide Gross Verified Results due to Variances

Initiative	Unit	Gross Incremental Peak Demand Savings (kW) (new peak demand savings from activity within the specified reporting period)				Gross Incremental Energy Savings (kWh) (new energy savings from activity within the specified reporting period)			
		2011	2012	2013	2014	2011	2012	2013	2014
Consumer Program									
Appliance Retirement	Appliances	0	0			0	0		
Appliance Exchange	Appliances	0	0			0	0		
HVAC Incentives	Equipment	-8,762	1,036			-16,245,279	1,854,833		
Conservation Instant Coupon Booklet	Items	15	0			255,975	0		
Bi-Annual Retailer Event	Items	117	0			2,373,616	0		
Retailer Co-op	Items	0	0			0	0		
Residential Demand Response	Devices	0	0			0	0		
Residential Demand Response (IHD)	Devices	0	0			0	0		
Residential New Construction	Homes	0	0			328,256	0		
Consumer Program Total		**-8,630**	**1,036**			**-13,287,430**	**1,854,833**		
Business Program									
Retrofit	Projects	4,504	6,218			22,046,931	40,101,273		
Direct Install Lighting	Projects	541	217			1,346,618	781,858		
Building Commissioning	Buildings	0	0			0	0		
New Construction	Buildings	3,243	0			11,323,593	0		
Energy Audit	Audits	492	337			2,391,744	1,636,457		
Small Commercial Demand Response	Devices	0	0			0	0		
Small Commercial Demand Response (IHD)	Devices	0	0			0	0		
Demand Response 3	Facilities	0	0			0	0		
Business Program Total		**8,780**	**6,771**			**37,108,886**	**42,519,588**		
Industrial Program									
Process & System Upgrades	Projects	0	0			0	0		
Monitoring & Targeting	Projects	0	0			0	0		
Energy Manager	Projects	0	75			0	799,151		
Retrofit	Projects	0	0			0	0		
Demand Response 3	Facilities	0	0			0	0		
Industrial Program Total		**0**	**75**			**0**	**799,151**		
Home Assistance Program									
Home Assistance Program	Homes	0	0			0	0		
Home Assistance Program Total		**0**	**0**			**0**	**0**		
Aboriginal Program									
Home Assistance Program	Homes	0	0			0	0		
Direct Install Lighting	Projects	0	0			0	0		
Aboriginal Program Total		**0**	**0**			**0**	**0**		
Pre-2011 Programs completed in 2011									
Electricity Retrofit Incentive Program	Projects	266	0			1,049,108	0		
High Performance New Construction	Projects	12,872	0			23,905,663	0		
Toronto Comprehensive	Projects	0	0			0	0		
Multifamily Energy Efficiency Rebates	Projects	0	0			0	0		
LDC Custom Programs	Projects	0	0			0	0		
Pre-2011 Programs completed in 2011 Total		**13,137**	**0**			**24,954,771**	**0**		
Other									
Program Enabled Savings	Projects	624	824			1,673,712	9,927,473		
Time-of-Use Savings	Homes	0	0			0	0		
Other Total		**624**	**824**			**1,673,712**	**9,927,473**		
Adjustments to 2011 Verified Results		**13,911**				**50,449,939**			
Adjustments to 2012 Verified Results			**8,707**				**55,101,043**		
Adjustments to Previous Years' Verified Results Total		**13,911**	**8,707**			**50,449,939**	**55,101,043**		

Activity and savings for Demand Response resources for each year represent the savings from all active facilities or devices contracted since January 1, 2011 (reported cumulatively).

The IHD line item on the 2013 annual report has been left blank pending a results update from evaluations; results will be updated once sufficient information is made available.

Gross results are presented for informational purposes only and are not considered official 2013 Final Verified Results