

2012 Conservation Results

December 2013



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Message from Vice-President, Conservation



Conservation is our first priority and is at the forefront while planning for the province's electricity in the future. Ontario is committed to investing in cost-effective programs to meet provincial and local energy needs before investing in other forms of new generation.

The Ontario Power Authority (OPA) is pleased to provide the 2012 conservation results report. In 2012, conservation programs in Ontario achieved **671 million kWh of verified annual energy savings and reduced 643 MW of demand across the province.** This includes savings from energy efficiency and demand response initiatives offered directly by the OPA and through local electric utilities.

Since the launch of **saveONenergy** programs in January 2011, local distribution companies (LDCs) have generated 379 MW of demand reduction and saved 3,906 GWh of energy cumulatively for the province and toward their regulated conservation targets.

Customers are becoming more actively engaged in reducing their energy consumption by participating in programs that encourage businesses to improve their overall operations and motivate residents to learn more about how to reduce their annual energy consumption. **Since 2006, Ontarians have conserved more than 2,400 MW of electricity, equivalent to powering over 750,000 homes across the province.**

Ontario is also continuously piloting new technologies and programs that are cost effective to help customers better manage their energy consumption. The province's conservation efforts and the suite of **saveONenergy** programs are valuable and cost-effective tools for consumers. **In 2012, conservation was delivered at a program cost to consumers of under 4 cents per kWh.** For every dollar invested in energy efficiency programs, Ontarians have saved two dollars in avoided energy costs.

We hope you enjoy reviewing this year's report.

Sincerely,



Andrew Pride

Vice-President Conservation, Ontario Power Authority

The OPA remains focused on engaging with communities and building relationships with our customers to sustain the effective delivery of conservation across the province today and in the future.

Introduction

Conservation programs are available to residents and businesses across Ontario and include energy and demand saving initiatives that cost-effectively reduces the demand for electricity, while providing customers with real time energy saving data and educational tools to help them better manage their overall energy use.

The Ontario Power Authority (OPA) guides the province's electricity conservation efforts and works collaboratively with local distribution companies (LDCs) and other industries to ensure Ontarians have reliable, clean and cost-effective sources of energy today and in the future.

This report provides insight into conservation programs and activities across the province, including Ontario's conservation efforts through the delivery of **saveONenergy** programs. These programs help increase energy conservation awareness with customers and enable our partners to effectively deliver conservation across the province. Information on the energy and demand savings results and participation can be found in appendix A.

Information on new innovative projects and technologies supported through the OPA's Conservation Fund is also provided, as well as information on codes and standards, time-of-use rates and other influenced conservation. All of these contribute to the overall energy and demand savings for the province's energy target set out in the Long-Term Energy Plan. The 2010 plan includes a target of 7,100 MW in demand reduction and 28TWh in energy savings by 2030.

The OPA is committed to transparently reporting on the energy savings and demand reduction achieved. All programs funded through the OPA in 2012 were evaluated using the evaluation, measurement and verification (EM&V) process and the learning's gained from this will help shape the future of conservation. The EM&V process involves undertaking activities aimed at assessing the resource savings, cost-effectiveness and market impacts of each program. The detailed EM&V reports are produced by third-party program evaluators and are among the most comprehensive in North America. A summary of the detailed EM&V reports can be found in appendices F and G and full reports can be viewed on the OPA website at powerauthority.on.ca.



Conservation Program Highlights:

- Over **1 million** energy efficient products through the **COUPON** program in collaboration with over 900 retail partners and stores
- Over **34,000** inefficient appliances were collected through the **FRIDGE & FREEZER** program
- Over **3,800** appliances were collected at retail locations across the province through the **EXCHANGE EVENT**
- Over **85,000** upgrades were completed through the **HEATING & COOLING INCENTIVE** – over half of all Ontarians who replaced their furnace or central air conditioning used the incentive
- Over **190,000** load control devices are now available in homes and small businesses across the province through the **peaksaver PLUS®** program
- Over **18,000** upgrades were completed through the **SMALL BUSINESS LIGHTING PROGRAM**
- Over **5,500** energy-efficient projects were completed through the **RETROFIT PROGRAM**



Business Program Success



PROJECT DETAILS

Incentive Amount Received

\$16,176

Project Completion Date

MAY 2011

147,684 ENERGY
kWh/YEAR SAVINGS

DEMAND SAVINGS > **5.8 kW**

The project at Rogers K-Rock Centre was one of dozens of energy conservation projects the City of Kingston undertook to improve energy efficiency at its buildings. Kingston Hydro worked with the City of Kingston and its energy management contractor, MCW Custom Energy Solutions, to help identify opportunities, through the **saveONenergy** incentives.

THE SCOPE OF THE PROJECT

Thanks to the **saveONenergy** program, Rogers K-Rock Centre received incentives which allowed for a variety of energy-saving retrofits throughout 2011- 2012. The scope of the work included:

- Upgrades to the automation system, which have vastly improved the facility operator’s ability to control the schedule and set points of the air handling units;
- Adding variable frequency drives to the blowers that supply the main bowl of the ice rink, allowing for considerable savings during the often long periods when the area isn’t occupied;
- Enhancing the lighting control system so that arena operators can adjust light levels depending on the use of the space. Now lights can be reduced or zoned off completely when the area is unoccupied;
- Replacing piping to the existing heating boilers and domestic hot water boilers to maximize the efficiency of the equipment.

Building New Skills for a Sustainable Future

Since 2011, the OPA has delivered technical training for LDC sales staff and customers to provide them with the knowledge, skills, and tools to confidently identify areas of potential conservation savings in businesses across the province.



The OPA provides incentives for the following training and certification initiatives:

- Building Operator Certification (BOC®)
- Energy Manager Training
- HVAC Installation Optimization
- Low-rise Builder Training
- Certified Energy Manager (CEM®)
- Certified Measurement and Verification Professional (CMVP®)
- Commissioning Agent Certification
- NRCan “Dollars to \$ense” energy efficiency workshops to technical and management staff across Ontario

To support **saveonenergy** program participation and effective energy management, the Industrial Program provides incentives for companies to hire energy managers. Embedded Energy Managers (EEMs) work for large businesses developing energy efficiency projects and energy management plans into their daily operations. The Industrial Program also provides incentives to LDCs to hire Roving Energy Managers (REMs). REMs provide support to multiple smaller facilities that cannot support the services of a full-time energy manager. **In 2012, 46 Energy Managers achieved over 7 million kWh in energy savings**, in addition to savings they may have achieved with the support of an incentive program. As of September 2013, funding for 67 EEMs and 26 REM positions has been approved, with 37 EEMs and 18 REM positions filled. The Industrial Program also includes incentives for LDCs to hire Key Account Managers (KAMs) to work directly with distribution-connected customers and assist them with the development of energy-efficiency projects.

To raise the importance of energy efficiency within the sectors, and drive participation in the **saveonenergy** programs the OPA launched the Energy Efficiency Services Provider (EESP) initiative. Five host organizations are now delivering energy management services through EESPs to their sector members, including municipalities, retail, water/wastewater treatment, healthcare, and hospitality.

Conservation Fund

Building a sustainable and prosperous Ontario by bringing innovative conservation solutions to market.

The OPA's Conservation Fund is helping transform the market by supporting customers and partners in the implementation of innovative energy saving projects and technologies. **Since 2005, the fund has committed \$37.3 million support to 176 projects.** These projects leveraged an additional \$121.6 million in partner support.

In 2012, the fund committed over \$8 million to 9 new projects. The new projects are contributing to overall energy savings, informing policies and programs, and promoting awareness of innovative conservation activities.

2012 Year in Review

NINE
NEW PROJECT
COMMITMENTS

\$8,461,133
AWARDED

35 **ACTIVE**
PORTFOLIO
PROJECTS | **70**
APPLICATIONS

SOCIAL BENCHMARKING PILOT



Conservation Fund - Supporting Innovative Projects and Technologies



Loblaws Companies Limited

The pilot program will test a performance-based approach to encouraging the commercial sector to capture energy saving opportunities through site-specific optimization of management practices, building operations, and capital upgrades. Individual stores will be motivated by a “pay for performance” incentive through which actual, not forecasted, energy savings are rewarded and lessons will provide insight into the feasibility of procuring conservation resources through this incentive model.



Social Benchmarking Pilot

New opportunities are arising in the market place to motivate and measure electricity savings based on **behavioural changes**. Supported through the Conservation Fund a series of social benchmarking pilots programs are being planned to run for approximately 14 months beginning in the fall of 2013. The purpose of these pilots is to test residential engagement strategies, savings potential, behavioural impact, and feasibility of integration into the overall Ontario market. Pilot hosts include Hydro One and Milton Hydro with more to be added.



Demand Response in Multi-Unit Residential Buildings Sector (MURB DR)

As part of a new innovation stream for LDCs, the MURB DR initiative is focused on the multi-unit residential sector. The pilot project will verify the energy and demand savings possible through building subsystem energy audits, installation of in-suite programmable thermostats and remote control of in-suite and common area cooling loads. If proven effective, pilot results will influence the design of a new province-wide demand response initiative for the multi-unit residential sector.

Culture of Conservation



The OPA conducts market research to monitor the culture of conservation across the province to identify the key influences driving energy-efficiency behaviour, and to help establish goals for future progress.

In 2012, the following common themes emerged in the residential sector:

- Many Ontarians recognize the financial and environmental benefits of conserving electricity but many feel that other Ontarians are more wasteful and believe that they themselves consume no more than an average amount of electricity, meaning there is no social norm prompting action. Ontarians are reducing the priority they place on conserving electricity and individual consumers are less confident that what they are doing to reduce electricity usage in their home is worthwhile.
- The amount of 'buzz' about conservation – the extent to which people are seeing, hearing and talking about it remains lower than two years ago.
- The OPA has been successful in engaging people through its **saveONenergy** programs. However, there is a clear opportunity for leadership in engaging people with electricity conservation on a broader, day-to-day level.

Ensuring customers have access to electricity conservation information is a priority in addressing these findings. Through the **saveONenergy** programs and the Conservation Fund, in particular through the social benchmarking pilot program, the OPA and its partners are focusing on encouraging residents and businesses to learn more about their own daily energy consumption habits.

In 2012, the OPA conducted market research among senior management in the business sector. The results indicated a rise in awareness of energy conservation over the past five years. Increasingly, energy efficiency is on the radar and electricity management is being intertwined with other top priorities within an organization. Savings are viewed as cost reductions and as a source of revenue to fund operations. Organizations and consumers look to government agencies to ensure the credibility of claims made about the impact and benefits when considering whether to participate in energy efficiency programs.

Survey research was also conducted across Ontario throughout 2012 to measure awareness of and participation in **saveONenergy** and consumer initiatives. Reported awareness was at 65%, higher than at any point in 2011. Other findings included:

- 62% of Ontarians agree that **saveONenergy** programs help save money
- 60% believe the programs do a good job at promoting more ways to save energy in the home
- 56% believe the programs make them want to take more responsibility for the amount of energy used in their home



Time-of-Use Pricing

Time-of-Use pricing (TOU) provides customers with a new way to manage their energy costs. TOU prices take into account when, as well as how much, electricity is used by each consumer. The goal of TOU pricing is to provide an incentive for consumers to shift some of their consumption away from periods of high demand (called “on-peak”) to periods of low demand (called either “mid-peak” or “off-peak”).

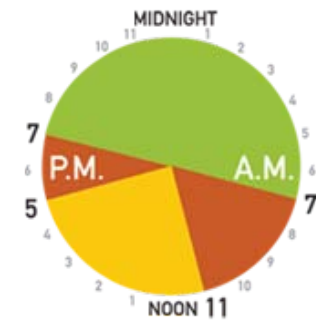
TOU prices were developed by the Ontario Energy Board (OEB) for low-volume electricity consumers (households and small businesses) as part of the Regulated Price Plan (RPP) for customers with smart meters. Savings from TOU pricing contribute to the overall provincial energy target.

Unlike conventional (analog) meters, smart meters not only track how much electricity customer use but also when they use it, providing key information to help consumers manage electricity costs. As of June 30 2013, 4.7 million customers in Ontario have smart meters and 96% are on TOU rates.

There are three different TOU rates as shown on the graphic provided. Twice a year (May 1st and Nov 1st) the prices are evaluated by the OEB and if necessary, the appropriate adjustments are made. The OEB adjust prices based on the electricity supply cost forecast, and any adjustments required due to differences between what was paid and the actual electricity supply costs for the previous period. Furthermore, TOU rates are adjusted to reflect winter or summer periods.

In 2013, under request of the OEB and in collaboration with LDCs, the OPA kicked off a third party independent evaluation of the impact of TOU prices in Ontario. Preliminary results from the first year analysis indicate that TOU prices have started to reduce consumption in peak periods by approximately 2-5%. The OPA will continue to work with its partners in 2014 to finalize TOU savings estimates.

Winter Weekdays



Summer Weekdays



Ontario Energy Board
<http://www.ontarioenergyboard.ca/OEB/Consumers/Electricity/Electricity+Prices>

Other Influenced Conservation

Other influenced conservation is the result of conservation activities by organizations and programs not funded by the OPA which result in electricity savings. There has not been a formal verification performed by the OPA. These numbers and the level of accuracy will vary with each organization's evaluation methodology.

	Energy Savings (GWh)	Demand Savings (MW)
Federal Government	99.6	N/A
Gas Utilities	51.9	N/A
GAM High-5	N/A	300

On January 1 2011, the manner in which the Global Adjustment Mechanism (GAM) charges are calculated changed for customers with an average peak demand over 5 MW (known as Class A customers)¹. GAM charges for these customers are now based on the percentage that their peak demand contributes to overall system demand during the peak hour of the five highest system load days within a year (called GAM High-5 days). These new rules provide Class A customers with strong incentive to reduce demand during the peak hours on high system load days since they will save on their electricity bill costs and increase their competitiveness. However, although GAM charges are based on five hours, customers do not know in advance which days or hours will be used to determine the charges. Therefore, Class A customers tend to reduce loads whenever system loads are expected to be high, which typically occur on summer afternoons.

A number of studies have estimated the change in consumption by Class A customers during system peaks. In 2013, the Market Surveillance Panel of Ontario commissioned a report estimating the impact of GAM High-5 between 200 and 379 MW, depending on the period of investigation (e.g., GAM-High 5 hours only vs. top 1% highest demand hours in 2011 and 2012)².

¹ The components of the Global Adjustment and the allocation methodology are set out in Ontario Regulation 429/04 (Adjustments under Section 25.33 of the Act) made under the Electricity Act, 1998

² Sen, Anindya, "Estimating the Effect of Global Adjustment on Electricity Consumption by Class A Customers: Evidence from a Natural Experiment", Report Submitted to the Market Surveillance of Ontario, Professor Anindya Sen, Department of Economics, University of Waterloo, Appendix A: Monitoring Report on the IESO-Administered Electricity Markets for the period from May 2012-October 2012, June 2013.
[www.ontarioenergyboard.ca/OEB/ Documents/MSP/MSP_Report_May2012-Oct2012_20130621.pdf](http://www.ontarioenergyboard.ca/OEB/Documents/MSP/MSP_Report_May2012-Oct2012_20130621.pdf)



Codes and Standards

Codes and Standards are a powerful, cost-effective tool for achieving energy savings and building a culture of conservation in Ontario. All savings from codes and standards are allocated towards achievement of the provincial conservation target.

In February 2012, energy efficiency regulation was amended to include a ban on in-efficient incandescent lighting beginning in 2014. This amendment harmonized both efficiency standards and compliance dates for general service lighting with federal energy efficiency regulations to ensure a consistent approach and to make compliance easier for consumers, retailers and manufacturers. Beginning on January 1, 2014, the sale of 100 and 75 watt incandescent bulbs manufactured after January 1, 2014 will not be permitted in Ontario. By the end of 2014, efficiency levels will also be raised for 60 and 40 watt equivalent light bulbs. According to data from Natural Resources Canada (NRCan), the new general service lighting efficiency standards will result in an estimated 5,700 GWh of annual electricity savings in Ontario's residential and commercial sectors by 2030.

In December 2012, the province filed an update to subject 19 new product classes to regulation, while enhancing the stringency for 26 others. Products in all sectors and all fuel types were impacted by these amendments including; air conditioning, water heaters, fluorescent lamps and ballasts, electronic equipment and induction motors. According to data from NRCan, this will result in an annual reduction of about 2,100 GWh of electricity per year by 2030. In addition, this update to regulation will reduce consumption of gas and oil in Ontario by 17 PJ/year by 2030.

Federally, Amendment 11 to the Energy Efficiency Regulations was published in October 2011 and came into force April 2012. As a result, seven products are now subject to increased stringency and/or scope of regulation, while five types of products are now subject to minimum energy performance standards and associated reporting and compliance requirements. All of these products (except for oil and electric boilers) have been updated in the new provincial regulation; seven have been harmonized with NRCan and three products (Large AC/HP, Commercial self-contained refrigeration and Incandescent reflector lamps) to higher, more stringent efficiency standards.

A new edition of Ontario's Building Code was filed in November, 2012 and will come into force on January 1, 2014. By January 1, 2017 the new building code will require permits for commercial buildings to reflect requirements that are 13% more efficient than they are today, and houses requiring a minimum of 15% more energy efficiency. Taking a longer term perspective, by adhering to the new edition of the building code, new houses will consume only 50% of the energy versus those built according to pre-2006 building codes, and large buildings only 65 percent of pre-2006 levels.

Ontario is the first jurisdiction to include limiting green house gas emissions and peak demand on the energy infrastructure as formal sub-objectives in its building code. These requirements take effect as of January 1, 2014. Together with the increased energy efficiency requirements of the code, these changes demonstrate Ontario's continuing leadership among its North American peers in making high energy performance integral to its building code.



Conclusion



Conservation in Ontario continues to evolve and a strong, cost-effective foundation is in place. Ontario's conservation efforts have resulted in thousands of jobs across the province and the many incentives available are enabling residents and businesses to become more active in reducing their energy consumption.

Many initiatives in 2012 achieved positive results contributing to greater energy savings for the province. The **saveONenergy RETROFIT** program participation rate doubled from 2011 and on the demand side, **peaksaver PLUS** has contributed to over 190,000 load control devices for homes and small businesses – helping reduce energy costs and helping the province reduce the strain on the electricity grid. More tools and training programs are also being created to help customers improve their operations and save on energy costs. It's successes like these that encourage our customers and partners to continue do more.

Conservation programs continue to be enhanced to make it easier for customers and LDCs to participate in **saveONenergy** programs. In 2012 OPA worked with LDCs to undertake approximately 17 significant improvements to the conservation programs such as the implementation of enhanced incentives, new measures, streamlined and reduced application and documentation requirements, and expedited processes for undertaking program updates. These improvements, combined with those undertaken in 2011 helped to contribute to a 39% increase in **saveONenergy** energy savings in 2012 over 2011.

There is also an increase in capability efforts for businesses and partners and momentum continues to grow as customers and marketplace becomes more familiar with the suite of programs. The OPA is ramping up capability initiatives and has expanded its channel engagement activities to create a number of technical training programs and workshops for customers and LDCs. Thousands of individuals have attended the workshops and these initiatives are providing the tools necessary to confidently identify areas of potential savings in businesses across the province.

The OPA remains committed to enabling programs and providing information to help customers across all sectors save energy and reduce costs. Conservation remains a cost-effective resource, reducing the need to build more expensive forms of generation. At a program cost of under 4 cents per kWh, the innovative technologies and energy-saving projects that all Ontarian's continue to implement will demonstrate Ontario's leadership and inspire plans for the future of energy conservation.

For more information on Ontario's electricity conservation efforts please visit saveonenergy.ca and powerauthority.on.ca.



About the Ontario Power Authority

OPA Vision

Leading Ontario in the development of North America's most reliable, cost-effective and sustainable electricity system.

OPA Mission

Together with our partners, we ensure that electricity needs are met for the benefit of Ontario both now and in the future. We plan and procure electricity supply from diverse resources and facilitate the measures needed to achieve ambitious conservation targets.

The OPA is responsible for ensuring a reliable, cost-effective and sustainable supply of electricity for Ontario. Its main activities are focused on planning the power system for the long term, ensuring the development of needed generation resources and strategic coordination of conservation efforts across the province.

About this Report

This report highlights the conservation results of OPA funded energy-efficiency and demand response initiatives implemented in Ontario in 2012. It includes verified savings from LDC and OPA delivered programs, as well as saving estimates from building codes, appliance and equipment standards, provincial and federal government programs, smart meter and time-of-use implementation, which also contribute to Ontario's conservation goals.

The contribution of projects under the OPA's Feed-in Tariff (FIT) and microFIT programs is also not included. Renewable resources associated with these programs are separately metered for the purpose of injecting electricity into the grid.



Appendix A – Conservation Initiatives

Initiatives	Delivery	Net Demand Savings (MW)			Net Energy Savings (GWh)			Participation			Metric
Residential Programs		2011	2011*	2012	2011	2011*	2012	2011	2011*	2012	
FRIDGE & FREEZER PICKUP	Contractors	4	-	2	25	-	14	56,110	-	34,146	Appliances
HEATING & COOLING INCENTIVE	Contractors	34	-6	20	64	-10	35	111,587	-18,866	85,221	Installations
peaksaver PLUS	LDCs	11	-	53	0	-	0	19,550	-	98,388	Devices
peaksaver PLUS IHDs	LDCs	-	-	-	-	-	-	-	-	49,689	Devices
COUPONS	Retailers	1	0	0	23	0	1	559,462	8,216	30,891	Products
EXCHANGE EVENT	Retailers	0	-	1	0	-	1	3,688	-	3,836	Appliances
SPRING & FALL EVENT	Retailers	2	0	2	31	2	29	870,332	81,817	1,060,901	Products

*2011 numbers previously reported experienced an adjustment after the reporting period due to additional data availability in 2013.

“-“ means no adjustment was made

IHD means In-Home Display



Appendix A – Conservation Initiatives

Initiatives	Delivery	Net Demand Savings (MW)			Net Energy Savings (GWh)			Participation			Metric
Business Programs		2011	2011*	2012	2011	2011*	2012	2011	2011*	2012	
DEMAND RESPONSE 2	Aggregators	69	-	56	56	-	78	2	-	2	Facilities
DEMAND RESPONSE 3	Aggregators	315	-	367	15	-	10	476	-	531	Facilities
SMALL BUSINESS LIGHTING	LDCs	25	1	16	65	1	61	20,297	444	18,494	Projects
<i>peaksaver</i> PLUS (small commercial)	LDCs	0	-	0	0	-	0	132	-	294	Devices
RETROFIT PROGRAM	LDCs	31	3	66	177	17	338	2,949	303	5,605	Projects
AUDIT FUNDING	LDCs	0	1	2	0	3	8	103	93	280	Audits
HIGH PERFORMANCE NEW CONSTRUCTION	LDCs	0	1	1	0	4	2	10	12	69	Projects
NEW HOME CONSTRUCTION	LDCs	0	0	0	0	0	0	7	19	19	Projects
Industrial Accelerator	OPA	0	-	5	1	-	46	2	-	3	Projects
Pre-2011 Projects	LDCs & service providers	48	2	3	259	3	13	-	-	-	-



Appendix A – Conservation Initiatives

Initiatives	Delivery	Net Demand Savings (MW)			Net Energy Savings (GWh)			Participation			Metric
Business Programs		2011	2011*	2012	2011	2011*	2012	2011	2011*	2012	
Pre-2011 peaksaver Residential		100	-	41	0	-	0	167,770	-	77,671	Devices
Pre-2011 peaksaver Business		3	-	3	0	-	0	4,657	-	4,350	Devices
Energy Manager		-	-	1	-	-	8	-	-	39	Projects
Home Assistance Program	LDCs	0	-	1	0	-	6	46	-	5,033	Homes
Program Enabled Savings		-	-	2	-	-	1	-	-	16	Projects
Total		645	2	642	717	20	651				

All results with a value of "0" represent a result of less than .5 MW/GW

Business programs include (Commercial & Institutional, Industrial, and Agricultural)

Pre-2011 Projects includes LDC Custom Programs, Electricity Retrofit Incentive Program, Multi-Family Energy Efficiency Rebates, and Toronto Comprehensive

Appendix B – Cost-Effectiveness Evaluation

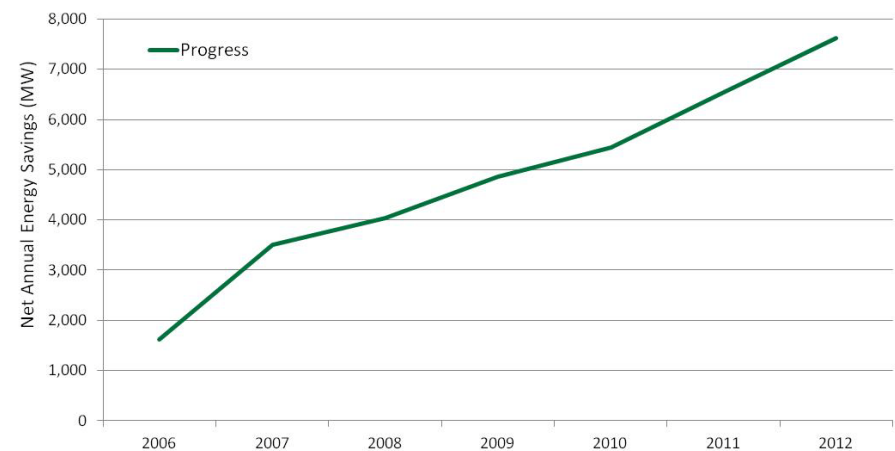
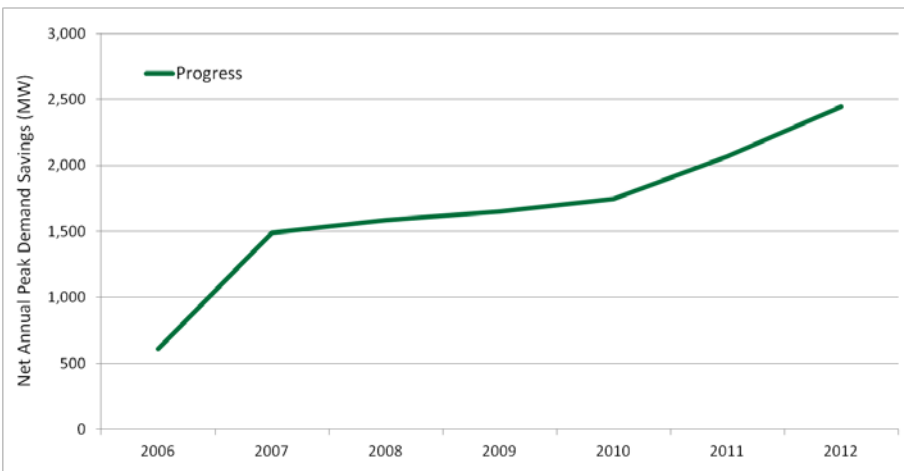
The OPA cost-effectiveness evaluations are used to identify the value of conservation for Ontario. Cost effectiveness is calculated using a suite of standard industry benefit-cost analysis and metrics: The tests evaluate the cost-effectiveness of the suite of **saveONenergy** programs delivered by the OPA and LDCs. A more detailed explanation of these tests can be found in appendix D.

2012 Total Resource Cost Test	
Benefit (\$ millions)	465.6
Cost (\$ millions)	351.2
Net Benefit (\$ millions)	114.4
Net Benefit Ratio	1.3
2012 Program Administrator Cost Test	
Benefit (\$ millions)	484.3
Cost (\$ millions)	256.9
Net Benefit (\$ millions)	227.4
Net Benefit Ratio	1.9
2012 Levelized Delivery Cost (Demand Response)	\$9,227/MW month
2012 Levelized Delivery Cost (Energy Efficiency)	\$39/MWh (3.9 cents /kWh)

Appendix C - Conservation Program Savings

The conservation savings achieved from energy efficiency and demand response initiatives contribute to the overall energy targets set out in Ontario's Long-Term Energy Plan (LTEP); 7,100 MW in demand reduction and 28TWh in energy savings by 2030. The table and graphs below show the province's 2012 savings and progress towards to LTEP targets.

Savings	Gross Peak Demand Savings (MW)		Gross Energy Savings (GWh)		Net Peak Demand Savings (MW)		Net Energy Savings (GWh)	
	2011	2012	2011	2012	2011	2012	2011	2012
Demand Response	639	520	71	88	498	519	71	88
Energy Efficiency	229	181	1015	776	147	124	646	583
Total	868	702	1,086	864	645	643	717	671



Appendix D – Cost-Effectiveness Test

The cost-effectiveness test is designed to evaluate the benefits and costs of conservation efforts. The net benefit of each test may be expressed either in absolute terms (where the net benefit is the difference between the present value (PV) of both the benefits and the costs) or as a ratio (where the net benefit is determined by dividing the PV of the benefits by the PV of the costs). A positive net benefit in absolute terms or a net benefit ratio greater than 1.0 indicates that benefits exceed costs from the perspective of each particular cost-effectiveness test.

Two tests, the Total Resource Cost (TRC) and the Program Administrator cost (PAC) test, along with the levelized delivery cost metric have been used to assess the cost-effectiveness of the conservation portfolio's resources.

Total Resource Cost Test

The total resource cost test measures the benefits and costs of conservation efforts from a societal perspective. It includes costs for incentives and all incremental customer equipment costs. This test is described by the following equation:

TRC Test Net Benefit (\$) = PV avoided supply cost – (PV incremental equipment cost + PV program cost)

Or (to determine net benefit as a ratio):
TRC test (ratio) = PV avoided supply cost / (PV incremental equipment cost + PV program cost)

Incentive costs are not included in the determination of the total resource cost test net benefit because incentives are a transfer of funds from the program sponsoring organization to participating customers and, consequently, do not directly enhance the aggregate net benefit from a societal perspective.

Program Administrator Cost Test

The program administrator cost test measures the benefits and costs of conservation efforts from the perspective of the program administrator. It includes the incentive and program administration costs and the verified net electricity savings. This test is described by the following equation:

PAC test net benefit (\$) = PV avoided supply cost – (PV incentive cost + PV program cost)

Or (to determine net benefit as a ratio):

PAC test (ratio) = PV avoided supply cost / (PV incentive cost + PV program cost)

Levelized Delivery Cost Metric

Levelized delivery costs reflect the combined program administration and incentive costs required to procure conservation resources, expressed on a levelized basis by spreading these costs over lifetime energy savings (expressed as \$/MWh).

Levelized delivery cost (\$/MWh) = PV (incentive cost + program cost) / PV lifetime MWh savings

Appendix E – Glossary of Terms

Net Energy/Demand Savings

Peak demand or energy savings directly influenced and attributable to a conservation initiative, taking into consideration the net to gross ratio.

Gross Energy/Demand Savings

Peak demand or energy savings that result directly from program-related actions taken by participants in a conservation initiative, regardless of the reasons for participation.

Incremental Savings

Peak demand or energy savings attributable to activity procured in a particular reporting period.

Net to Gross Ratio

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

Levelized Delivery Cost

A metric that expresses delivery costs per unit of energy or peak demand saved on an annualized basis, expressed in \$MWh or \$/MWmonth, respectively, taking into account the lifetime energy savings associated with the implementation of a conservation and demand management initiative.

Ex Ante Load Impacts

Load reduction capability of a demand response initiative under a set of pre defined conditions (e.g., 1-in-10 weather year), factoring in the amount of contracted resources, historical performance, load patterns, and forced outage rates, where applicable. The Ex Ante load impacts are, by nature, forward looking (representing the “insurance value” of the demand response resource) and are based on the number of registered participants on December 31. **Ex Ante is used throughout this report unless otherwise specified.**

Ex Post Load Impacts

Actual load impacts attributable to a demand response resource for a given year, but do not necessarily reflect the load reduction capability of the Demand Response initiative. Effectively, historical Ex Post results are tied to specific conditions that occurred for that given event, including weather conditions, market prices, and the number of participants dispatched through the demand response initiative.



Appendix F – Residential Programs

COUPONS (Annual)

This initiative encourages customers to purchase energy-efficient products through year round coupons. The coupons offer instant savings towards the purchase of a variety of low cost, easy to install energy efficient measures and can be redeemed at participating retailers. Downloadable coupons can be found at saveonenergy.ca. This initiative is delivered by the OPA contracting centrally for the distribution of the coupon booklets across Ontario. LDCs also distribute coupons at local events. The OPA entered into agreements with specified retailers to honor the coupons.

Key Findings from Evaluation Report

- *The number of coupons associated with the redemption of 2012 Annual Coupons was 90% lower than 2011 Instant Coupon Booklet. Key factors for the decrease include:*
 - *Shorter duration of available coupons (September 2012 – December 2012)*
 - *In 2012, only online coupons were available.*
 - *2011 had both online coupons and coupon mailing booklets.*

SPRING EVENT and FALL EVENT

This initiative provides instant point of purchase discounts to individuals at participating retailers for a variety of energy-efficient products. Twice a year (spring and fall), participating retailers host month-long rebate events. Customers are encouraged to visit participating retailers where they can find coupons redeemable for instant savings towards a variety of low cost, easy to install energy-efficient measures. This initiative is delivered by the OPA entering into arrangements with participating retailers to promote the discounted products, and to post and honour related coupons. LDCs refer retailers to the OPA and participate in in-store events.

Key Findings from Evaluation Report

- *15% lower net savings due to a change in the net-to-gross factors (increased free-ridership, less participant behavior spillover, and less non-participant like spillover).*
- *Majority of participation, energy and demand savings resulting from standard CFLs.*
- *15% of net savings due to approximately 73,000 coupons for new LED measures. Consumers and retailers alike are communicating their appreciation for the inclusion of LED coupons and hope for more in the future.*



Appendix F – Residential Programs

EXCHANGE EVENT

This initiative permanently decommissions older, inefficient window air conditioners and portable dehumidifiers in Ontario. Appliance exchange events are held during specific periods throughout the year at retail locations across the province. Customers are encouraged to bring in their old air conditioners and dehumidifiers in exchange for coupons/discounts towards the purchase of new energy-efficient products. The OPA contracts with participating retailers for the delivery of this program and for the collection of eligible units.

Key Findings from Evaluation Report

- Higher per unit savings for dehumidifiers drove the overall increase in 2012 savings.
- 30% increase in exchanged dehumidifiers over 2011, leading to an increase of 4% in overall participation.

FRIDGE AND FREEZER PICKUP

This initiative facilitates the removal of older inefficient appliances from customers in Ontario. This is an energy efficiency initiative that offers free pick up and decommissioning of large secondary refrigerators, freezers, window air conditioners and portable dehumidifiers. The OPA centrally contracts for province-wide marketing, call centre, appliance pick up and decommissioning. LDCs provide local marketing and coordination with municipal pick up where available.

Key Findings from Evaluation Report

- Decrease in 2012 participation by 39% compared to 2011
- On-site metering provided updated per unit assumptions:
 - o Small decrease (3.5%) in savings for refrigerators; and
 - o Sizeable increase (17.5%) in savings for freezers



Appendix F – Residential Programs

HEATING AND COOLING INCENTIVE

This initiative encourages the replacement of existing heating systems with high efficiency furnaces equipped with electronically commutated motors (ECM), and of existing central air conditioners with ENERGY STAR® qualified systems and products. The replacement systems are installed by approved Heating, Refrigeration, and Air Conditioning Institute (HRAI) qualified contractors. The OPA contracts centrally for delivery of this program and LDCs encourage local contractors to participate in the initiative.

Key Findings from Evaluation Report

- *Small decrease (10%) in per unit savings assumptions for furnace with ECM due to change in 2012 customer mix and furnace fan usage.*
- *Small increase (10%) in free-ridership related to the furnace with ECM measure.*

peaksaver PLUS

This initiative serves as a demand response initiative designed to help residential customers reduce their demand during peak times throughout the year. Load control devices are installed and can be remotely activated when demand is high to help manage electricity consumption. This is done by making small adjustments to the appliance(s) that the customer enrolls in the program (including central air conditioner, electric water heater and/or in-ground pool pump) for short periods of time. This initiative is delivered by LDCs recruiting customers and procuring technology.

Key Findings from Evaluation Report

- *Province-wide per-unit estimates for an extreme peak August day were determined to be 0.50 kW for residential Central Air Conditioning (CACs) and 0.64 kW for small commercial CACs.*
- *The energy display offer had a positive influence on enrollment and re-enrollment with between 20 to 35% of new participants saying they wouldn't have enrolled without the IHD offer.*



Appendix G – Business Programs

SMALL BUSINESS LIGHTING

This initiative helps businesses achieve savings through the free installation of more energy-efficient lighting and water heating measures to eligible owners and tenants of commercial, institutional and agricultural facilities and multi-family buildings. The initiative targets customers in the general service <50kW account category and offers turnkey lighting and electric hot water heater measures. This initiative is delivered through LDCs, participants enroll directly with an LDC, or would be contacted by the LDC/LDC designated representative.

Key Findings from Evaluation Report

- *The saturation of eligible customers, preferred business types and increased participation from buildings that operate less during the summer peak period contributed to lower realization rates for demand savings in 2012.*
- *It is expected that participation in the initiative will increase in 2013 due to the incentive cap change from \$1,000 to \$1,500.*

RETROFIT

This initiative offers incentives to customers to upgrade to more energy-efficient equipment for lighting, space cooling, ventilation and other measures. Upgrade projects can be classified into either: 1) prescriptive projects where prescribed measures replace associated required base case equipment; 2) engineered projects where energy and demand savings and incentives are calculated for associated measures; or 3) custom projects for other energy-efficiency upgrades. This initiative is delivered by the LDCs.

Key Findings from Evaluation Report

- *Verified savings for prescriptive lighting projects were 15% higher than reported; and verified operating hours were 11% higher than assumed.*
- *A lower realization rate in the engineered measure track can be partially explained by overstated lighting operation hour assumptions reported on the application.*
- *Net-to-gross ratios for the initiatives were above 75% in 2012, which is about 5% higher than in 2011.*

Industrial Accelerator

Industrial Accelerator is designed to assist eligible large transmission-connected companies to fast track capital investment in major energy efficiency projects. Participants will contractually commit to delivering specific conservation targets within a set period of time and to maintaining them over the expected life of the project.

Key Findings from Evaluation Report

- *Projects have long lead times and in 2012 only one was put into service*
- *There were 16 engineering studies completed during 2012, 8 preliminary engineering studies and 9 detailed engineering studies*



Appendix G – Business Programs

DEMAND RESPONSE 2

This initiative is a contractual load shifting program in which participants specify the load shift window and amount of load shifting.

Key Findings from Evaluation Report

- *The DR2 program led to distinct changes in customer loads and reduced the volatility of use during peak hours, however the demand reductions were not fully matched by shifting to off peak hours.*
- *A significant portion of reductions occurred outside of customers contracted windows.*

DEMAND RESPONSE 3

This initiative is for commercial and industrial customers, of 50 kW or greater to reduce the amount of power being used during certain periods of the year. The Demand Response 3 (DR3) Initiative is a contractual resource that is an economic alternative to procurement of new peak generation capacity. DR3 comes with specific contractual obligations requiring participants to reduce their use of electricity relative to a baseline when called upon. This Initiative makes payments for participants to be on standby and energy payments for the actual energy reduction provided during a demand response event. Participants are scheduled to be on standby approximately 1,600 hours per calendar year for possible dispatch of up to 100 hours or 200 hours within that year depending on the contract. DR3 is delivered by Demand Response Providers (DRP), under contract to the OPA. The OPA administers contracts with all DRPs and Direct Participants that provide in excess of 5 MW of demand response capacity. OPA provides administration including settlement, measurement and verification, and dispatch. LDCs provide outreach and marketing efforts.

Key Findings from Evaluation Report

- *2012 saw improvements in the performance of DR-3 participants resulting in higher ex ante realization rates, particularly for industrial participants.*
- *The program diversified but still remains highly concentrated.*
- *The largest 20 contributors account for 60% of the contractual demand reduction.*

HIGH PERFORMANCE NEW CONSTRUCTION (HPNC)

This initiative encourages builders to construct more energy-efficient homes. It provides builders and their project decision makers with incentives for offsetting the cost of energy-efficiency measures, resulting in lower long-term operating costs, greatly improved marketability and enhanced occupant comfort. This initiative is delivered by LDCs.

Key Findings from Evaluation Report

- *Custom projects account for 66% of program savings, with the remainder coming from the prescriptive track.*



Appendix G – Business Programs

EXISTING BUILDING COMMISSIONING

This initiative offers incentives for optimizing (but not replacing) existing chilled water systems for space cooling in non-residential facilities. Incentives are offered to customers for the following project phases; scoping study phase, investigation phase, implementation phase, and hand off/completion phase. This initiative is delivered by LDCs.

Key Findings from Evaluation Report

- *Initiative was not evaluated in 2012*

NEW HOME CONSTRUCTION

Working with participating home builders and renovators across Ontario, this initiative provides incentives to builders for the purpose of promoting the construction of energy-efficient residential homes. It encourages home builders to construct new homes that are efficient, smart, and integrated (applicable to new single family dwellings). Incentives are provided in two key categories as follows; incentives for home builders who install energy-efficient measures as determined by a prescriptive list or via a custom option; and incentives for home builders who meet or exceed aggressive efficiency standards using the EnerGuide performance rating system. LDCs engage local builders, supported by the OPA air coverage driving builders to their LDC for additional information.

Key Findings from Evaluation Report

- *All projects are opting for the prescriptive or performance path – there have been no custom project applications to date*

PROCESS AND SYSTEMS

The process and systems upgrade program is designed to help facilities find and hold onto major energy savings. It includes valuable financial incentives and technical expertise needed to upgrade key systems and make improved energy management a part of how Ontarians do business. The program is made up of two complementary streams; energy efficiency upgrades, which includes a three-step feasibility and upgrade process (preliminary engineering study, detailed engineering study and capital incentives); and energy management and monitoring (embedded energy manager and monitoring and targeting), which provides long-term support to grow savings.

Key Findings from Evaluation Report

- *Energy managers are seen as important drivers of program enables savings projects*
- *Additional support (training and guides) to energy managers may further influence the adoption of energy efficient measures by participants*

