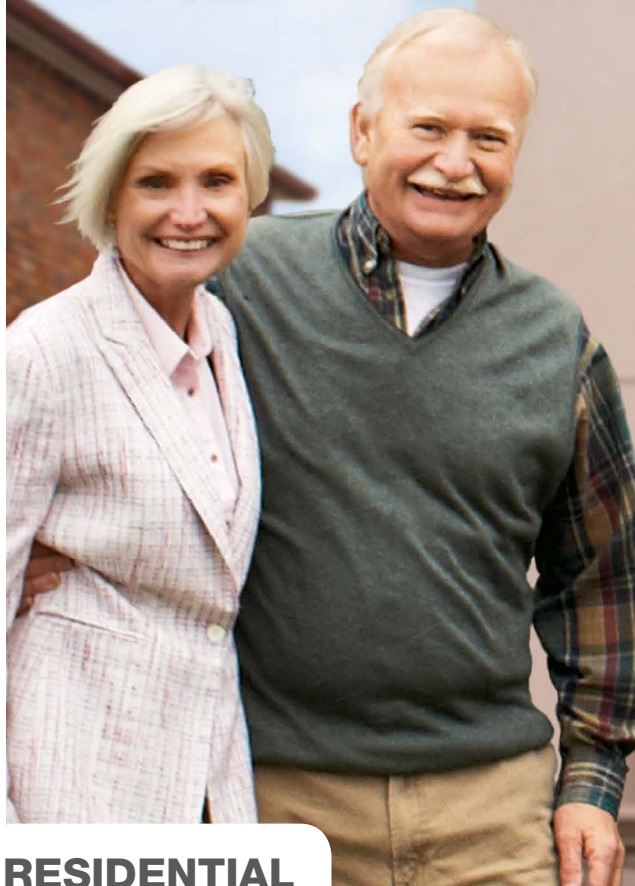


2013 CONSERVATION RESULTS

December 2014



RESIDENTIAL



BUSINESS



INDUSTRIAL

“When it comes to saving money and growing our economy, energy efficiency isn’t just low hanging fruit; it’s fruit laying on the ground. The most prosperous, competitive economies of the 21st century will be those that use energy efficiently.”

Steven Chu

U.S. Energy Secretary

June 2009

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Message from the Vice-President, Conservation

We are pleased to provide the 2013 conservation results report and to share some of our success stories from this past year.

When I started my journey with the Ontario Power Authority (OPA) just over four years ago, I wanted to drive change in our industry with increased focus on customers while still providing good system value. This would be created by a strong conservation brand that represented trusted and valuable savings for all electricity consumers in Ontario.

The **saveONenergy^{OM}** brand, created in 2010, is now recognized by over 70 percent of Ontarians. The **saveONenergy** programs include many incentives to motivate residents and businesses to make smart energy management decisions while reducing their overall energy consumption. Since the programs launched in January 2011, our local distribution company (LDC) partners have cumulatively **saved 5,139 gigawatt-hours (GWh) of energy and realized 639 MW¹ of demand reduction** toward their regulated conservation targets and in support of the provincial conservation goals. This is great success for ambitious targets.

In 2013 alone, conservation programs in Ontario achieved **733 million kilowatt-hours (kWh) of verified annual energy savings and reduced 667 megawatts (MW) of demand across the province**. This includes savings from energy-efficiency and demand-response initiatives funded by the OPA and offered directly through our channel partners and by LDCs. I am proud to say that we consistently deliver verified conservation at a cost of 4¢ per kilowatt-hour. For each dollar we invest in our customers being more efficient, we save two dollars in avoided generation.

Between 2005 and 2013, Ontarians have conserved more than 8.7 billion kWh of electricity from programs as well as through changes to codes and standards — enough to power a city about the size of Mississauga for a year. We also continue to pilot new technologies and programs through the Conservation Fund, which supports innovative electricity conservation projects and programs.

Conservation remains Ontario's first priority. As we embark on the next six-year commitment, Ontario's conservation programs will be **investing \$500 million dollars a year toward our customers' energy-savings needs** and in turn creating **a system value of close to \$1 billion**.

Congratulations to all residents, businesses and industries of Ontario for your commitment to conservation. Keep up the great work to make Ontario a North American leader in conservation!

Sincerely,

Andrew Pride
Vice-President Conservation, Ontario Power Authority



¹ LDC savings reported at the household or business consumption level rather than at the system level.

“The new Conservation First Framework will enable the achievement of all cost-effective conservation and foster innovation through information sharing and the adoption of new technologies and approaches, including innovative performance management structures to drive greater energy savings.”

Minister of Energy

Ministerial direction to the OPA

March 31, 2014

Introduction

The Ontario Power Authority guides the province's electricity conservation efforts and works collaboratively with LDCs and other industries to ensure Ontarians have **reliable, clean** and **cost-effective** sources of **energy** today and in the future. We are committed to providing all sectors across the province with effective conservation programs to help customers save on energy and the province reduce its demand for electricity.

Conservation programs are available to residents and businesses across Ontario and include energy- and demand-saving initiatives that cost-effectively reduce 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 OPA reports on the energy savings and demand reduction achieved across the province. This report provides insight into conservation programs and activities, including Ontario's **saveONenergy** programs. These programs help increase energy conservation awareness and enable our partners to effectively deliver conservation to customers. In 2013 alone, **saveONenergy** programs and other initiatives saved 733 GWh and 667 MW. Information on the energy- and demand-savings results and participation can be found in Appendix A. **Ontarians have conserved more than 8.7 TWh of electricity** from programs as well as through changes to codes and standards from 2005 to the end 2013 – **enough to power a city about the size of Mississauga for a year**. There are many success stories from 2013, including the launch of the **ABORIGINAL CONSERVATION PROGRAM**. The first year of the program will provide retrofits to 12 First Nation communities, including two remote communities.

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 conservation initiatives. All of these activities contribute to the overall energy and demand savings for the province's energy target set out in the Long-Term Energy Plan. The 2013 plan includes a target of 30 TWh in electricity consumption reduction in 2032. The government forecasts that to remain on track to achieve this target, 8.7 TWh, of savings need to be achieved between 2015 and 2020 through programs enabled by its **Conservation First Framework** beginning in 2015. The province is also aiming to use demand response to meet 10 percent of peak demand by 2025, equivalent to approximately 2,400 MW under forecasted conditions.

All programs funded through the OPA in 2013 were evaluated using the OPA's evaluation, measurement and verification (EM&V) process and the results and key findings will help shape the future of conservation. The EM&V process involves assessing the resource savings, cost-effectiveness and market impacts of each program. The detailed EM&V reports are produced by independent 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 www.powerauthority.on.ca.

“Conservation is our first priority. And for good reason. It’s less costly than building new generation, it helps businesses and residents better manage their energy costs, it provides a favourable return on investment for customers (15-30 percent return on investment) and it reduces greenhouse gases.”

Andrew Pride

OPA Vice-President, Conservation

Energy Summit 2014



Conservation Program Highlights

733 GWh and **667 MW**

saved through **saveONenergy** programs and other initiatives

Verified **saveONenergy** program savings increased by **20 PERCENT** in 2013 over 2012



17,800

upgrades were completed through the **SMALL BUSINESS LIGHTING** program



OVER 1.2 MILLION
ENERGY-EFFICIENT PRODUCTS

were purchased through the **COUPON** program in collaboration with over **900** retail partners and stores



NEARLY
20,000

inefficient appliances were collected and recycled through the **FRIDGE & FREEZER** program



OVER

5,300

energy-inefficient appliances were collected at retail locations across the province through the **EXCHANGE EVENT**

OVER
90,000 ➔

upgrades were completed through the **HEATING & COOLING INCENTIVE** — over **HALF** of all Ontarians who replaced their furnace or central air conditioning used the incentive

HOME ASSISTANCE PROGRAM

— PARTICIPATION INCREASED BY OVER —

430% TO ABOUT **27,000**

12

FIRST NATION COMMUNITIES

were selected for retrofits through the **ABORIGINAL CONSERVATION PROGRAM**



8,800

energy-efficient projects were completed through the **RETROFIT PROGRAM**, which account for **80 percent** of **BUSINESS PROGRAM** savings

OVER 8 MILLION kWh OF ELECTRICITY

saved from energy-efficiency projects with large transmission-connected customers.



Residential Program Success

A special thanks to ARCA Canada for eight years of fridge and freezer pickups.

After almost eight years in market, the **FRIDGE AND FREEZER PICKUP** program is coming to an end on December 31, 2014. The program is ending on a positive note, as almost all of the available fridges and freezers in Ontario have been picked up. That's more than 365,000 fridges and freezers between 2006 and 2013, saving enough electricity to power 19,000 homes for one year. Each appliance that is retired through the program is stripped of copper, plastic and aluminum (recycled whenever possible), drained of oil and ozone-depleting CFCs, and the steel is recycled and reused to help build things such as bridges and roads. A special thanks to our partner ARCA Canada for its years of service, facilitating the needs of customers and the OPA and promoting the culture of conservation in Ontario.

“ARCA Canada is humbled and feels privileged to have worked with the Ontario Power Authority and local distribution companies throughout this great province to reduce energy usage in a cost-effective and environmentally responsible manner.”

Joe Berta

Managing Director, ARCA Canada



“ The **saveONenergy** program helped us implement energy savings projects across 129 of our retail stores in order to reduce our energy consumption and carbon footprint. ”

Rob Simpson
Manager of Design and Sustainability, Canadian Tire

PROJECT DETAILS

ENERGY SAVINGS
2,500,000 kWh per year

DEMAND SAVINGS > **1,000** kW

ANNUAL NATURAL GAS SAVED
2,000,000 m³

CARBON REDUCTION
5,000 tonnes



Business Program Success

Canadian Tire is saving energy and reducing electricity costs thanks to **saveONenergy** incentives.

Through the OPA's **saveONenergy RETROFIT PROGRAM**, Canadian Tire was able to implement energy-efficiency upgrades in 129 of its retail stores across Ontario.

Canadian Tire had already carried out a number of energy-efficiency initiatives in its existing stores – from lighting retrofits and building automation to the way it heats and cools its buildings – and was eager to learn more about how the **saveONenergy** program could support projects such as demand control ventilation to reduce energy consumption.

Demand control ventilation uses sensors to monitor the levels of carbon dioxide in the air on a continual basis. When more people are in a building, oxygen consumption and carbon dioxide production increases. The monitors detect this and increase the supply of outdoor air. When fewer people are in a building, the controller reduces the volume of ventilation air to reduce energy consumption while still maintaining the indoor air quality. This is in contrast to the traditional approach that maintains a constant air flow volume based on the size and occupancy of a space – and can often result in a significant waste of energy and money when fewer people are in a building.

Enbridge Gas Distribution, the OPA, Toronto Hydro and Canadian Tire's business partner, Inviro Engineering, worked together to complete the demand control ventilation retrofit at 129 Ontario stores in just four months.

Due to the ease of the **saveONenergy RETROFIT PROGRAM** and the benefits it gained from this project, Canadian Tire is continuing to look at the latest energy-saving technologies, including advances in lighting, and opportunities to improve its efficiency in heating and cooling.



Production line from hot mill rehear furnace

“

We need minimum capital investment because we are funding the projects from a combination of incentives and the energy savings from the projects themselves.

”

Keith Smith

Manager, Capital Planning, ArcelorMittal Dofasco

Five energy-efficiency projects under way including:

- Installation of a turbo generator that converts existing by-product fuels into electricity (estimated savings: 34,400 MWh annually)
 - A compressed air system upgrade (estimated savings: 2,434 MWh annually)
 - Installation of high efficiency belt presses (estimated savings: 2,895 MWh annually)
 - Installation of variable speed drives on a series of large pumps and fans (estimated savings: 4,865 MWh annually)
 - And the installation of new efficient compressors (estimated savings: 2,753 MWh annually)
- Estimated electricity cost savings: **\$6.8 million annually**
 - Estimated total project costs: **\$14.5 million**
 - Estimated incentive: **\$7.4 million**



Industrial Program Success

At Hamilton's ArcelorMittal Dofasco steel plant, one of the pillars of its business is controlling energy costs.

Energy accounts for 20 to 25 percent of the cost of a finished steel coil and is the second-largest input cost after raw materials, says Mike Cortese, Senior Energy Specialist, Utilities, for ArcelorMittal Dofasco. "Raw material costs can't be compressed. Energy has a degree of efficiency and flexibility that you're always working on. You can control energy costs."

"While non-capital energy-efficiency initiatives, including training and education and efficient operating procedures, are important in controlling costs, multi-million-dollar capital investments produce the greatest cost reductions, particularly when replacing older, inefficient equipment," Cortese says.

To meet the financial challenge, ArcelorMittal Dofasco used the OPA Industrial Accelerator program. The program is critical for advancing energy objectives, says Smith. "Through the Industrial Accelerator program, we can demonstrate that our portfolio of energy projects is cash neutral to Arcelor Mittal, because project spending is offset by Industrial Accelerator incentives plus project savings."

Five energy-efficiency projects are under way at the Hamilton steel plant, with a total cost of \$14.5 million. These may be receiving approximately \$7.4 million in incentives. When fully operational, the projects could reduce electricity demand by 8.4 MW, a \$6.8 million annual cost saving. Incentive payments are distributed as each project is being built (with 25 percent on signing), rather than being paid on completion.

"The advantage of the Industrial Accelerator program is that the company can run a portfolio of energy-efficiency projects simultaneously. By the time the final project in the energy portfolio needs cash, the first project is generating electricity savings that can be used for financing," Smith says. "ArcelorMittal Dofasco is looking to the Industrial Accelerator program as the key enabler in getting more projects under way to cut its energy use and reduce waste."

“We are investing in new approaches to conservation and using new technologies to further our efforts, while also investing in people who have the knowledge and vision to take conservation measures from theory into practice, from concept to reality.”

Andrew Pride

OPA Vice-President, Conservation

World Energy Engineering Congress, 2013



Beyond Equipment:

Growing Energy Skills in the Energy-Efficiency Marketplace

In 2013, capability-building activities ramped up with the continued delivery of technical training and industry-recognized training and certification for LDCs, customers and channel partners. These capability-building initiatives are key drivers to achieving deeper savings beyond direct equipment investments by embedding the skills, tools and expertise necessary for individuals to undertake energy-efficiency projects.

The OPA provides incentives for training and certification initiatives to encourage companies to invest in training as a means to managing their energy use.

In 2013, over 1,800 energy-efficiency professionals, including building operators; energy managers; heating, ventilation and air conditioning (HVAC) technicians; residential homebuilders; commissioning agents; evaluation professionals and LDCs, participated in these capability-building initiatives:

- Building Operator Certification (BOC®)
- Energy Manager Training
- HVAC Installation Optimization
- Residential Homebuilder Training
- Certified Energy Manager (CEM®)
- Certified Measurement and Verification Professional (CMVP®)
- Commissioning Agent Certification
- NRCAN “Dollars to \$ense” energy-efficiency workshops.

To build a culture of conservation and energy management, the OPA established an Energy Managers Forum to provide a venue for sharing of best practices, expertise and support. It consists of more than 90 energy management professionals, including Embedded Energy Managers (EEMs) working for large businesses, Roving Energy Managers (REMs) providing support to multiple smaller facilities and Energy Efficiency Services Providers (EESPs) who work with specific sectors.



We are 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. The Conservation Fund supports innovative electricity conservation projects that:

- build marketplace capacity for conservation actions
- test new or unique conservation program elements
- verify the energy savings potential and cost-effectiveness of novel demand-side management technologies and processes
- can be scaled up to achieve significant energy savings in Ontario.

From 2005 to the end of 2013, the fund has committed \$48.7 million in support to 190 projects. These projects leveraged an additional \$125.8 million in partner support.

In 2013, the fund committed over \$9 million to 17 new projects. The new projects are contributing to overall energy savings, informing policies and programs, and promoting awareness of innovative conservation activities. [Click here for more information about the fund.](#)



Conservation Fund

2013 Year in Review

—17—
NEW PROJECT
COMMITMENTS

\$9.5 million
AWARDED

35 **ACTIVE
PORTFOLIO
PROJECTS**

58
APPLICATIONS

LDC PROGRAM INNOVATION STREAM LAUNCHED

ONE HUNDRED THOUSAND
SOCIAL BENCHMARKING PILOT PARTICIPANTS

\$11,000,000
PARTNER LEVERAGED

"Our Conservation Fund is a test bed for innovative ideas to advance energy efficiency and conservation. The OPA provides seed money and additional support is provided by others to help commercialize ground breaking new processes and technologies—projects like Temporal Power and ENBALA Power Networks, and Fifth Light Technology and REGEN Energy. We are proud to support the next generation of energy-efficiency technologies and the great talent in Ontario."

Colin Andersen, CEO of the OPA



Left to right: Jeff Veltri, founder and Chief Technology Officer, Temporal Power; Cam Carver, CEO, Temporal Power



Conservation Fund - Supporting Innovative Projects and Technologies

It's all about balance: supporting innovation and business growth while building Ontario's energy storage capability

Two Ontario-based startup companies are proving that, with a little ingenuity, even variable energy sources like wind and solar can be successfully stored and used to balance out fluctuations in Ontario's energy grid. Temporal Power Ltd. and ENBALA Power Networks recognized the need for finding efficient ways to effectively manage and store energy. Easily balancing power flows will become increasingly critical over time. Each received grants of \$300,000 from the OPA's Conservation Fund, and began pilot projects in 2010 using two very different technologies – a flywheel for **Temporal Power** and a smart grid platform for **ENBALA**.

Temporal's flywheel is a mechanical battery that can convert electrical energy into kinetic energy, store it, then change it back to electrical energy as needed. OPA funding allowed the company to scale up and begin to work toward a utility-level, grid-scale device.

ENBALA's smart grid platform allows for efficient regulation of the electricity demanded by large industrial consumers at any given time. Its technology works by connecting its customers' critical energy-consuming equipment into a smart grid platform that can then respond to signals ENBALA receives from Ontario's electricity system operator, the Independent Electricity System Operator (IESO). When there is too much demand on the energy grid, the platform tells the connected equipment to use less power; when the grid has more electricity than it needs, the platform tells the machines they may use more – without causing a noticeable change or disruption at the facility.

Support from the Conservation Fund helped boost the credibility of the technology and its use in Ontario. "At that early stage," says Temporal's CEO Cam Carver, "the OPA's funding was absolutely critical. We had some Ontario utilities interested in the technology, but they were wary. The OPA's support was an important reference point for investors and gave us credibility with utilities."



ENBALA's grid-balancing platform

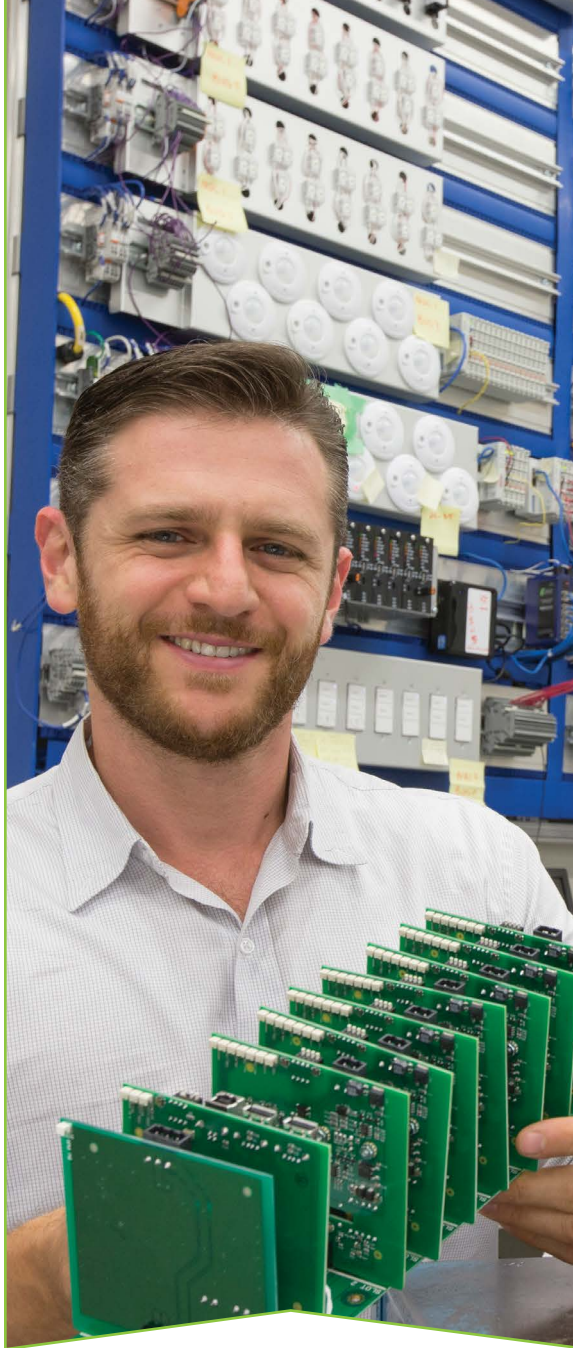


Conservation Fund - Supporting Innovative Projects and Technologies

(continued)

ENBALA's President and CEO Arthur Vos agrees. "When you're trying something new and different, the money's nice – there can be a long gap between investing in an idea and getting paid – but it's also the credibility that you need. The OPA funding has helped us commercialize our idea, to get it to market and grow significantly."

Energy storage was integrated into Ontario's latest Long-Term Energy Plan (LTEP), and the Minister of Energy has asked the OPA and IESO to procure 50 megawatts of energy storage by the end of 2014. Now, in the small town of Minto, Ontario, 10 underground flywheels can provide two MW of energy storage to the power grid. This is the first commercial grid-connected energy storage facility in the province.



Conservation Fund - Supporting Innovative Projects and Technologies

Two Ontario energy startups take on the world, and win. All it took was a little support at the right time.

The OPA's Conservation Fund saw a lot of promise in the technology of two Ontario-based startups when it supported pilot projects for **Fifth Light Technology** and **REGEN Energy Inc.** Since receiving the OPA funding, each company has gone on to develop a burgeoning list of customers for its energy-efficiency technology while attracting significant investment from the private sector.

FIFTH LIGHT TECHNOLOGY

In 2009, Fifth Light Technology received \$250,000 from the Conservation Fund to help pilot its web-based dimming and lighting management system at the new Sault Area Hospital in Sault Ste. Marie. Just three years later, in 2012, the company was purchased by Cooper Industries, a global leader in lighting systems. Cooper has since been acquired by Eaton, a leading power management company. Fifth Light makes up the company's digital addressable brand and all of Cooper's lighting fixtures now come with Fifth Light's software controls, giving it global exposure.

"The hardest phase in developing any company is to go from bench top to commercial. You might have proof of concept, but without early adopters, who's going to know about it? We needed a commercial site, and the OPA's funding meant we were able to get the Sault Area Hospital pilot project. Now, Infrastructure Ontario requires our technology in all of the province's new construction. We set the standard."

Tony Dableh, Fifth Light Technology co-founder and now Director of Sales and Services for Eaton's Cooper Control Group

Tony Dableh, co-founder of Fifth Light Technology Ltd., now Director, Sales and Services, Eaton's Cooper Control Group



Left to right: Steve Pataki, Facilities Manager, Toronto Cricket Skating & Curling Club (REGEN client); Mark Kerbel, Executive Vice-President, Business Development, REGEN



Conservation Fund - Supporting Innovative Projects and Technologies

(continued)

REGEN ENERGY INC.

Electric utilities need a solution that enables them to reach small- to mid-size customer loads, which can prove to be challenging. This problem is not unique to North America – it's faced by utilities around the world. REGEN's solution, developed in part with the \$240,000 it received from the OPA in 2008, allows small- to mid-sized commercial, industrial and institutional buildings, and the utilities that supply them, to benefit from demand management and automated demand response. REGEN places controllers on electrical cooling, heating and discretionary loads. The controllers then send simple messages to each other to reduce peak demand. The OPA funding allowed REGEN to test its idea at three very different facilities. The pilots proved that REGEN's devices could cost-effectively balance electrical loads and reduce peak electrical demand while maintaining the comfort of building occupants. This led to investment by the Business Development Bank of Canada (BDC), and also to investments from California-based NGEN Partners.

"At the time of our first investment, REGEN had already developed significant intellectual property and was well-positioned to lead the evolution of the demand management and demand response markets. REGEN had produced a channel-friendly solution and a unique value proposition that were already attracting attention from important industry stakeholders. BDC Venture Capital realized that, with the right support, REGEN could aggressively scale its business and achieve great success."

Larry Lam, a Partner in BDC Venture Capital's Energy/Cleantech Fund



Culture of Conservation

The OPA conducts market research to monitor the culture of conservation in Ontario in the consumer and business sectors and to measure progress over time.

Monitoring the culture of conservation helps inform the OPA's strategies for engaging people and businesses. By evaluating the experience of residential and business customers who participate in a **saveONenergy** program, we can identify areas of strength in program design and customer service and determine where there are opportunities for improvement.

RESIDENTIAL SECTOR

Most consumers (90 percent) agree that using energy wisely is expected of people in Ontario. They also feel they can control their home electricity use through everyday actions (79 percent).

In recent years, we have seen conservation decline as a high priority for individuals – to 77 percent in 2013 from 92 percent in 2008. This may be because up to 90 percent feel they are already at least as energy efficient as other Ontarians.

Research to identify what drives engagement reveals a lack of a consistent public profile and dialogue about energy efficiency. While awareness and the reputation of **saveONenergy** programs is good, an opportunity exists to keep day-to-day energy efficiency top of mind.

BUSINESS SECTOR

The majority of businesses and property management organizations (68 percent) believe it is very important to reduce the amount of electricity they consume. And this number is growing – compared to a year ago, nearly half of all organizations surveyed place a greater priority on managing their consumption. This is primarily to save money and achieve more efficient business operations. Environmental responsibility and creating an organizational culture of using energy wisely are also strong motivating factors.

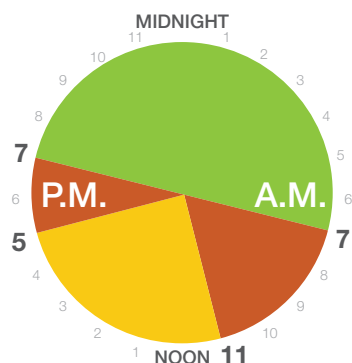
While many businesses are taking action, there is still a great deal of opportunity. A minority (41 percent) have a plan to manage the amount of electricity their organization consumes. The majority of those plans (62 percent) are part of broader organizational efficiency strategies, indicating the extent to which energy efficiency is becoming integrated into core business planning.

saveONenergy PROGRAM

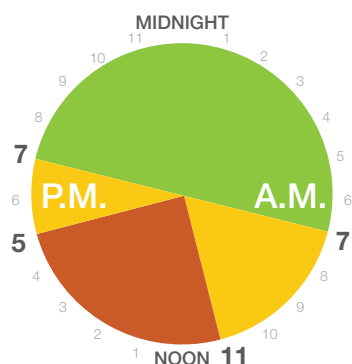
The experience of participating in a **saveONenergy** program is very positive for both consumer and business customers:

- Participating in the **saveONenergy COUPON EVENT, HEATING & COOLING or FRIDGE & FREEZER PICKUP** met or exceeded the expectations of over 90 percent of consumers.
- In the final quarter of 2013, most business customers (87 percent) said they would recommend a **saveONenergy** business program to others, and a strong majority (76 percent) said the experience of participating was so positive it made them more likely to participate again.
- Most customers (81 percent) were very satisfied with the helpfulness of their contact and a similar number felt the amount of effort involved in participating was reasonable.

Winter Weekdays (November 1-April 30)



Summer Weekdays (May 1-October 31)



OFF-PEAK
7.2 ¢/kWh

MID-PEAK
10.9 ¢/kWh

ON-PEAK
12.9 ¢/kWh
CURRENT PRICE

Ontario Energy Board
www.ontarioenergyboard.ca/OEB/Consumers/Electricity/Electricity+Prices



Time-of-Use Rates

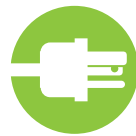
Time-of-use (TOU) rates provide customers with a new way to manage their energy costs. TOU rates take into account when, as well as how much, electricity is used by each consumer. The goal of TOU rates is to provide an incentive for consumers to shift some of their consumption away from periods of high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

TOU rates were developed by the Ontario Energy Board (OEB) for low-volume electricity consumers (households and small businesses) with smart meters as part of the Regulated Price Plan (RPP). Unlike conventional (analog) meters, smart meters not only track how much electricity customers use but also when they use it, providing key information to help consumers manage electricity costs. Over 4.8 million customers in Ontario have smart meters and over 97 percent are on TOU rates.

There are three different TOU rate periods as shown on the left. The OEB evaluates rates twice a year, and, if necessary, the appropriate adjustments are made effective May 1 and November 1 of each year. The OEB adjusts rates based on a number of factors, such as the amount of power it expects consumers to use, the price of different sources of electricity over that time, the types of power that will be available and the accuracy of previous projections. Adjustments are due to differences between what was paid to generators and the actual electricity supply costs for the previous season. TOU rates are also adjusted to reflect winter and summer seasons.

In 2012, at the request of the OEB and in collaboration with LDCs, the OPA launched a third-party independent evaluation of the impact of TOU rates in Ontario. First-year results from the study indicated that TOU rates had started to shift demand during peak periods by approximately two to five percent for residential customers. There were no statistically significant impacts for small business customers.

Results for the second year of the study, covering the year 2013, showed evidence of load shifting among residential customers, with an average summer peak demand reduction of up to three percent. The provincial average was a 0.7 percent reduction – approximately 40 MW – to the provincial residential summer peak demand. There was no evidence of energy savings in any regions. Small business customers showed some evidence of load shifting in central and northern regions of Ontario. Results from the second-year analysis will be published by the end of 2014. A third study will be completed to determine the provincial peak demand impact of TOU rates in 2015.



Other-Influenced Conservation

Other-influenced conservation is the result of conservation activities by organizations and programs not funded by the OPA that result in electricity savings. Note that the OPA has not performed a formal evaluation of these data. The numbers and the level of accuracy will vary with each organization's evaluation methodology.

	Energy Savings (GWh)	Demand Savings (MW)
Federal Government²	89.0	N/A
Gas Utilities	35.7	N/A
Industrial Conservation Initiative/Global Adjustment Mechanism (GAM) High-5	N/A	850

The savings reported are ancillary electricity savings resulting from some of the actions promoted by natural gas demand-side management (DSM) programs run by natural gas utilities, and federal conservation programs that generate electricity savings. Savings estimates are directly from the implementing organizations.

The Industrial Conservation Initiative program³ (ICI) was introduced by the Ontario government in 2010. For customers with a peak demand greater than 5 MW (known as Class A customers), their global adjustment charges are based on the percentage that their peak demand contributes to overall system demand during the peak hour of the five highest system load days in a year. As of May 1, 2014, Ontario customers with a peak demand greater than 3 MW will also be able to participate by opting in to the program.

Although ICI charges are based on the five highest hours of peak demand, customers do not know in advance which days or hours will be used to determine the charges. Therefore, ICI customers tend to reduce their loads whenever system load is expected to be high, typically on summer afternoons.

²Includes energy-efficiency training in the buildings sector (Dollars to \$ense training); impacts from programming in the industrial sector, including training and the Canadian Industry Program for Energy Conservation; ENERGY STAR® and R-2000 home labeling. It does not include code impacts.

³Formerly referred to as the Global Adjustment Mechanism (GAM) High-5, 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*.



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.

Several changes to codes and standards occurred in 2013.

- In December 2013, following a public review period, the Ontario government amended the province's energy-efficiency regulation to include new or enhanced minimum efficiency standards for 25 products, such as clothes washers and dryers, refrigerators, dishwashers, water heaters, boilers, televisions, fluorescent lamps and small motors. Based on available energy-saving data from Natural Resources Canada and the United States Department of Energy (US DOE), this amendment is estimated to save 4.9 TWh per year of electricity by 2030. It is also estimated to save 9.1 petajoules per year of gas and oil by 2030, equivalent to the total energy used by 80,000 homes.
- Effective December 31, 2013, an amendment to the federal Energy Efficiency Regulations revised Canada's minimum energy performance standards for general service incandescent light bulbs, and aligned the standards with those in the United States.⁴
- While there were no changes in 2013, Ontario's 2012 Building Code came into effect on January 1, 2014, with certain energy efficiency related provisions to come into force on January 1, 2014, 2015 and 2017. A brief overview of the over 700 changes is available online.⁵ The building code is a forward-looking document, updated approximately every five years, and an important policy tool in implementing key priorities of the Ontario government.
 - By January 1, 2017, the new building code will require commercial buildings to be 13 percent more energy efficient and houses to be 15 percent more energy efficient than if built to the standards in the 2006 building code. Taking a longer-term perspective, by adhering to the new edition of the building code, new houses will consume only 50 percent of the energy consumed by houses built according to pre-2006 building codes, and large buildings will consume only 65 percent of pre-2006 level buildings.
 - Ontario is the first jurisdiction in Canada to include limiting greenhouse gas emissions and peak demand on the energy infrastructure as formal sub-objectives in its building code. 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.

⁴More information about Canada's Energy Efficiency Regulations for lighting products can be found at <http://www.nrcan.gc.ca/energy/products/whats-new/13583>.

⁵A presentation outlining the updates in the 2012 Building Code are available at <http://www.mah.gov.on.ca/AssetFactory.aspx?did=10201>.



Conclusion

Ontario continues to be a North American energy conservation leader. The **saveONenergy** suite of programs is evolving and continues to gain momentum as customers and businesses become more familiar with the tools and incentives available to help reduce their energy consumption. In 2013, verified **saveONenergy** program savings exceeded 600 GWh, which represents an increase of 20 percent over 2012. This was achieved as a result of success stories from homeowners, small businesses, industry and many others.

Business programs continued to perform very well in 2013, contributing to over 71 percent of total program energy savings. The already strong **RETROFIT PROGRAM** realized further gains, providing 80 percent of total business program savings. **SMALL BUSINESS LIGHTING** contractors played an important role, encouraging customers to apply to the **RETROFIT PROGRAM** to increase savings with access to additional incentives and resources.

Consumer programs also made conservation gains. The **HEATING & COOLING INCENTIVE** remained the greatest source of program savings, followed by the **COUPON** initiatives. The measures that provided the greatest savings in the programs were LED and CFL lights, and furnace fans with electronically commutated motors (ECMs). Participation in the **HOME ASSISTANCE PROGRAM** increased fourfold in 2013, as more LDCs offered the program to their customers.

On the demand side, the **peaksaver PLUS®** program and **DEMAND RESPONSE 3** proved to be reliable demand-response resources. These provincial resources were used for the first time in 2013 to address local needs.

Industrial program projects also started to generate verified savings, with most projects delivering at or above the level of energy savings expected at the time of application.

LDCs continued to make progress on peak demand savings through energy-efficiency measures. Energy-efficiency measures that contribute to peak demand savings (e.g., heating and cooling measures, compressed air units, etc.) continued to be a focus of LDC efforts.



Conclusion

(continued)

Program enhancements remained a high priority in 2013, with many significant operational advancements focused on creating a better customer and LDC experience. The programs continued to make it easier for customers and LDCs to participate, through enhanced incentives, new measures, streamlined and reduced application and documentation requirements, and faster processes for undertaking program updates. These changes help ensure that the **saveONenergy** programs stay ahead of changing market conditions. Technical program tools that facilitate and improve access to enhanced information also played a significant role in the success achieved this year.

Key market sectors were engaged in 2013 through capability-building programs targeted at home builders and HVAC installers. Thousands of Ontarians attended workshops to increase their conservation knowledge and develop the skills they need to identify areas of potential energy savings for businesses throughout the province.

The experience of participating in **saveONenergy** programs remains very positive for both consumer and business customers. The OPA will work closely with the LDCs and other partners to ensure a smooth transition to the next phase of conservation in Ontario. In 2015, Ontario will launch the Conservation First Framework for the next six years. Most of the existing programs will continue and the OPA will support market creativity for innovative program design and delivery, creating new opportunities for customers across all sectors to access conservation.

As the conservation landscape in the province evolves, the OPA remains committed to engaging with communities across Ontario and to strengthening relationships with all of our partners to ensure that conservation in our province is delivered as cost-effectively and efficiently as possible – now and in the future.

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

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 fulfills a unique and vital role in Ontario's electricity sector – coordinating province-wide conservation efforts, planning the electricity system for the long term and contracting for electricity resources. We work closely with our industry partners and a broad range of stakeholders across the province to carry out these activities.



About the Ontario Power Authority

ABOUT THIS REPORT

This report highlights the conservation results of OPA-funded energy-efficiency and demand response initiatives implemented in Ontario in 2013. It includes verified savings from LDC- and OPA-delivered programs, as well as saving estimates from building codes, appliance and equipment standards, 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 not included. Renewable resources associated with these programs are separately metered for the purpose of injecting electricity into the grid.



APPENDIX A

Conservation Initiatives

The tables below outline the net energy and demand savings for the residential and business programs.

Initiative	Delivery	Metric	Participation (see Metrics)			Net Demand Savings (MW)			Net Energy Savings (GWh)		
RESIDENTIAL PROGRAMS			2011	2012	2013	2011	2012	2013	2011	2012	2013
FRIDGE & FREEZER PICKUP	Contractors	Appliances	56,110	34,146	20,952	4	2	2	25	14	9
HEATING & COOLING INCENTIVE	Contractors	Installations	92,743	87,427	91,581	34	15	21	64	25	37
peaksaver PLUS	LDCs	Devices	19,550	98,388	171,733	11	53	100	0	0	0
peaksaver PLUS - Energy Display	LDCs	Devices	-	49,689	133,657	-	-	-	-	-	-
COUPONS	Retailers	Products	567,678	30,891	346,896	1	0	1	23	2	8
EXCHANGE EVENT	Retailers	Appliances	3,688	3,836	5,337	0	1	1	0	1	2
SPRING & FALL EVENT	Retailers	Products	952,149	1,060,901	944,772	2	2	1	31	31	18
2013 Residential Program Total								126			74



APPENDIX A

Conservation Initiatives

(continued)

Initiative	Delivery	Metric	Participation (see Metrics)			Net Demand Savings (MW)			Net Energy Savings (GWh)		
BUSINESS PROGRAMS			2011	2012	2013	2011	2012	2013	2011	2012	2013
DEMAND RESPONSE 2	Aggregators	Facilities	2	2	2	69	56	55	56	78	76
DEMAND RESPONSE 3	Aggregators	Facilities	476	531	520	315	367	335	15	10	7
SMALL BUSINESS LIGHTING	LDCs	Projects	20,741	18,691	17,782	25	17	20	65	63	70
peaksaver PLUS (small commercial)	LDCs	Devices	132	294	1,211	0	0	1	0	0	0
peaksaver PLUS – Energy Display (small commercial)	LDCs	Devices	-	0	378	-	-	-	-	-	-
RETROFIT PROGRAM	LDCs	Projects	2,819	6,134	8,785	31	69	69	177	355	401
AUDIT FUNDING	LDCs	Audits	198	345	319	0	2	3	0	10	18
HIGH PERFORMANCE NEW CONSTRUCTION	LDCs	Projects	22	69	86	0	2	2	0	6	5
NEW HOME CONSTRUCTION	LDCs	Projects	26	19	86	0	0	0	0	0	0
PROCESS & SYSTEMS	LDCs	Projects	-	-	3	-	-	0	-	-	3
Industrial Accelerator Program	OPA	Projects	2	3	3	0	5	1	1	46	8
Pre-2011 Projects	LDCs and service providers	-	-	-	-	48	5	1	259	16	4
2013 Business Program Total								487			592



APPENDIX A

Conservation Initiatives

(continued)

Initiative	Delivery	Metric	Participation (see Metrics)			Net Demand Savings (MW)			Net Energy Savings (GWh)		
OTHER INITIATIVES			2011	2012	2013	2011	2012	2013	2011	2012	2013
Pre-2011 <i>peaksaver</i> Residential	-	Devices	167,770	77,671	69,976	100	41	40	0	0	0
Pre-2011 <i>peaksaver</i> Business	-	Devices	4,657	4,350	4,445	3	3	3	0	0	0
Energy Manager	-	Projects	-	42	205	-	1	4	-	8	24
HOME ASSISTANCE PROGRAM	LDCs	Homes	46	5,033	26,756	0	1	3	0	6	22
ABORIGINAL CONSERVATION PROGRAM	LDCs	Homes	-	-	584	-	-	0	-	-	2
Program-Enabled Savings	-	Projects	14	56	13	-	2	6	-	1	17
2013 Total Savings - All Programs and Initiatives	-	-	-	-	-	645	643	667	717	671	733

Notes:

- All results with a value of 0 represent a result of less than .5 MW/GWh.
- Pre-2011 projects include LDC Custom Programs, Electricity Retrofit Incentive Program, Multi-Family Energy Efficiency Rebates and Toronto Comprehensive. These programs are no longer offered.
- Adjustments to previous years' results are captured in the year in which the measure was installed.



APPENDIX B

Cost-Effectiveness Evaluation

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

2012 Total Resource Cost Test	2013	2011-2013
Benefit (\$ millions)	563	1420
Cost (\$ millions)	461	1182
Net Benefit (\$ millions)	102	238
Net Benefit Ratio	1.22	1.20
2012 Program Administrator Cost Test		
Benefit (\$ millions)	568	1452
Cost (\$ millions)	334	711
Net Benefit (\$ millions)	234	741
Net Benefit Ratio	1.70	2.04
Levelized Delivery Cost (Demand Response)	9,368 \$/MW-Month	12,024 \$/MW-Month
Levelized Delivery Cost (Energy Efficiency)	44 \$/MWh (4.4¢/kWh)	37 \$/MWh (3.7¢/kWh)



APPENDIX C

Cost-Effectiveness Tests

Cost-effectiveness tests are 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. Consequently, they 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

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 D

Conservation Program Savings

The conservation savings achieved from energy efficiency and demand-response initiatives* contribute to the overall energy target of 30 TWh in energy savings by 2032 as set out in Ontario's 2013 Long-Term Energy Plan. The province is aiming to use demand response to meet 10 percent of peak demand by 2025, equivalent to approximately 2,400 MW under forecasted conditions. The table and graphs below show the province's 2013 savings and progress towards the targets.

Savings	Net Persisting Peak Demand Savings (MW)							
	2006	2007	2008	2009	2010	2011	2012	2013
Demand Response	319	710	678	641	545	546	906	1,469
Energy Efficiency	289	780	905	1,010	1,201	1,568	1,602	1,794
Total	608	1,490	1,583	1,650	1,746	2,113	2,507	3,264

Savings	Net Persisting Energy Savings (GWh)							
	2006	2007	2008	2009	2010	2011	2012	2013
Demand Response	0	0	1	89	148	71	88	84
Energy Efficiency	1,621	3,501	4,037	4,770	5,291	6,621	7,736	8,632
Total	1,621	3,501	4,037	4,859	5,439	6,692	7,824	8,716

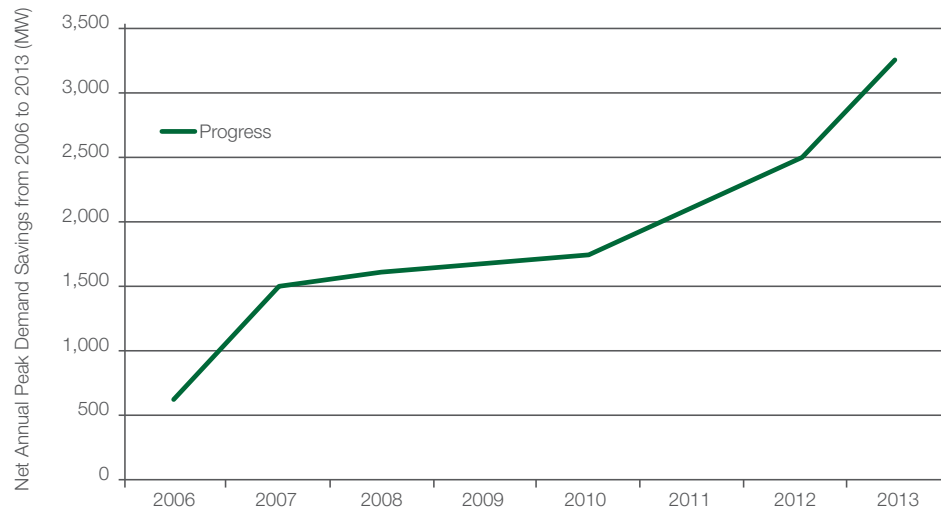
*Initiatives include 2006-2010 OPA-funded conservation programs, [saveonenergy](#) programs, Industrial Accelerator, other-influenced conservation, and savings from codes and standards and pricing programs.



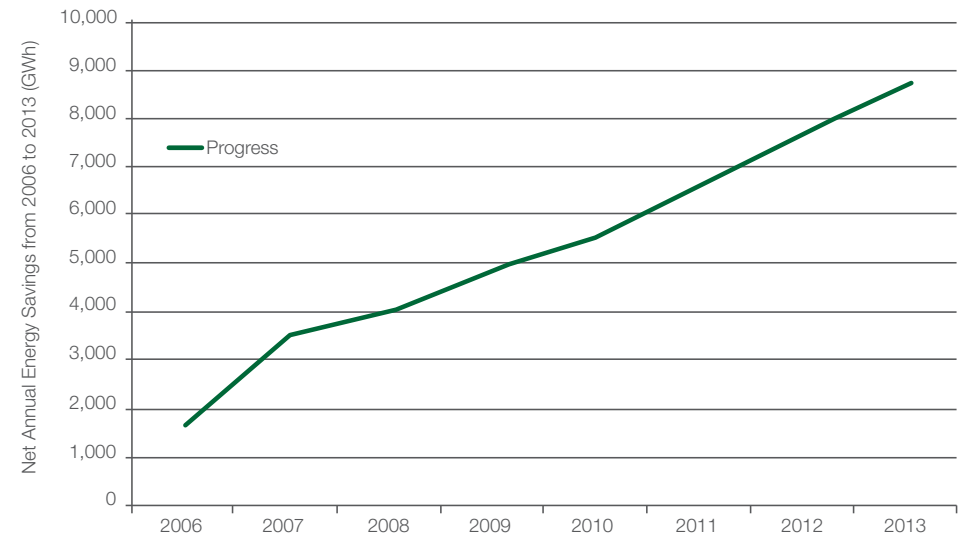
APPENDIX D

Conservation Program Savings

NET ANNUAL PEAK DEMAND SAVINGS (2006-2013)



NET ANNUAL ENERGY SAVINGS (2006-2013)





APPENDIX E

Glossary of Terms

1-in-10 weather conditions

Weather conditions that are expected to occur 1 out of every 10 years.

Gross 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.

Energy conservation measure

A single technology, operational change, or action implemented by a customer at the customer's site.

Ex Ante load impacts

Load reduction capability of a demand-response initiative under a set of predefined 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.

Free ridership

A measure of program participants who would have implemented the program measure or practice even in the absence of the program.

Incremental savings

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

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.

Net savings

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

Net-to-gross ratio

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

Program-enabled savings

Energy and demand savings resulting from additional energy-efficiency actions that program participants or non-participants might have undertaken because of program influence, but for which they received no financial incentives.

Realization rate:

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

Simple cycling

An appliance cycling algorithm that controls the duty cycle to limit the appliance to running no more than 50 percent of the time.



APPENDIX E

Glossary of Terms

Spillover

Occurs when the presence of an energy-efficiency program influences customers to reduce energy consumption or demand, but the incremental savings are not directly a result of the program.

Unit conversions

A kilowatt is a unit of electrical power that indicates how much demand an electrical device puts on the supply of electricity for one second of time. The conversion rates are as follows:

Kilowatt	1,000 watts
Megawatt	1,000 kilowatts
Gigawatt	1,000 megawatts
Terawatt	1,000 gigawatts

A kilowatt hour is a unit of energy that indicates how much energy is used over a specific period of time. For example, a kilowatt-hour is the amount of energy equivalent to a power of one kilowatt running for one hour. The conversion rates are as follows:

Kilowatt hour	1,000 watt-hours
Megawatt hour	1,000 kilowatt-hours
Gigawatt hour	1,000 megawatt-hours
Terawatt hour	1,000 gigawatt-hours



APPENDIX F

Residential Programs

COUPONS – ANNUAL

This initiative encourages customers to purchase energy-efficient products with coupons available throughout the year. 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 honour the coupons.

Key Findings from Evaluation Report

- Customers redeemed more than 10 times, from 30,891 to 346,896, as many annual coupons in 2013 as in 2012 because of new LED coupons and full-year availability of all coupons. Customers redeemed 13 percent more annual coupons in 2013 than in 2011, the first full year of annual coupons, for the same reasons.
- There was a significant reduction in savings from specialty CFL-related measures. About 30 percent of participants replaced incandescent bulbs in 2013, compared to 60 percent 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 percent of coupons redeemed in 2013 were for general-purpose LEDs and specialty CFLs and LEDs, contributing 89 percent of the net annual energy savings and 84 percent of the net demand savings.
- The net-to-gross ratio was approximately eight percent higher in 2013 than in 2012, due to the inclusion of spillover, i.e., the purchase of additional coupon initiative measures without using coupons because of program influence.

COUPONS – 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 (in the 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

- The number of coupons redeemed during the spring and fall events in 2013 increased by 19 percent compared to 2012 because of a substantial increase in LED purchases with event coupons.
- Net annual savings were 36 percent lower in 2013 compared to 2012 primarily because of significant reductions in per-unit savings estimates for standard and specialty CFLs. There was a decrease in the replacement rate of incandescent bulbs, with only 30 percent of 2013 participants estimated to have replaced incandescent bulbs compared to 60 percent in 2012. This led to a change in the base measure used to calculate savings.
- 87 percent of coupons redeemed were for general-purpose and specialty CFLs and LEDs, contributing 80 percent of the net annual energy savings and 73 percent of the net demand savings.
- The net-to-gross ratio was approximately eight percent higher in 2013 than in 2012 due to the inclusion of spillover, i.e., the purchase of additional coupon initiative measures without using coupons because of program influence.



APPENDIX F

Residential Programs

EXCHANGE EVENT

This initiative permanently decommissions older, inefficient 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 dehumidifiers in exchange for 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

- 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 by 36.6 percent
- Of the participants surveyed who reported they had replaced the dehumidifiers they exchanged, 100 percent reported purchasing ENERGY STAR models.
- The number of eligible dehumidifiers collected in the program increased by 28 percent. In 2013, 5,337 dehumidifier units were collected compared to 3,617 dehumidifier units in 2012.
- The net-to-gross ratio was 52.6 percent, a slight increase from 51.5 percent in 2012.

FRIDGE & 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 pickup and decommissioning. LDCs provide local marketing and coordination with municipal pick up where available.

Key Findings from Evaluation Report

- Per-unit savings increased for both energy (+15.4 percent) and demand (+4.0 percent) between 2012 and 2013, due to a greater proportion of refrigerators and freezers with large volumes and a manufacturer date before the National Appliance Energy Conservation Act was implemented in 1987. Dehumidifiers also showed a higher per-unit savings related to the change in ENERGY STAR definitions.
- The success of the program meant that overall participation continued to decline, due to fewer eligible appliances remaining in Ontario, with 20,952 appliances recycled in 2013, compared to 34,146 in 2012 and 56,110 in 2011. The program has experienced close to a 40 percent reduction (39.1 percent 2011 to 2012, 41.1 percent 2012 to 2013) in recycled appliances in each subsequent year of operation.
- The net-to-gross ratio stayed constant at 43 percent between 2012 and 2013.



APPENDIX F

Residential Programs

HEATING & COOLING INITIATIVE

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

- Total participation (equipment) increased 7.5 percent from 2012 to 91,581.
- Per-unit furnace savings decreased from 1,139 kWh per year in 2012 to 1,090 kWh per year. This is due to a slight shift in the number of participants who used their furnace fan non-continuously both before and after the retrofit rather than changing from continuous to non-continuous operation.
- Per-unit energy and demand-savings assumptions for central air conditioners did not change from 2012. The per-unit savings for air conditioners are as follows:
 - 14.5 seasonal energy efficiency ratio (SEER) central air conditioners:
 - gross energy 0.165 kW
 - gross demand 147.297 kWh
 - 15 SEER central air conditioners:
 - gross energy 0.234 kW
 - gross demand 208.898 kWh

HOME ASSISTANCE PROGRAM

This initiative is for income-qualified customers, and offers free installation of energy-efficient measures that improve the comfort of their home, increase efficiency and help them better manage their electricity bills. 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.

Key Findings from Evaluation Report

- Participation increased by more than 430 percent – 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.
- The realization rate for demand savings remained low as the program audit tool calculated high demand savings for certain insulation measures. Recommended adjustments to demand savings factors were made after the 2013 program year.



APPENDIX F

Residential Programs

peaksaver PLUS

This initiative is a demand-response initiative to help residential customers reduce their demand during peak times. Load-control devices are installed and can be remotely activated when demand is high to help manage electricity consumption throughout the province. Small adjustments are made 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. The initiative is delivered by LDCs procuring technology and recruiting customers). Energy displays are also available to participants to help monitor and manage their electricity use.

Key Findings from Evaluation Report

- The cycling strategy for the central air conditioning load control was changed from 50 percent simple cycling to 60 percent.
- 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 percent 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 2012 analysis.
- This year's energy display analysis yielded no statistically significant energy savings; however, the displays continue to be a key driver of program participation.

Note:

The key evaluation findings are derived from the OPA's 2013 evaluations of the **saveONenergy** programs. These findings were developed by third party evaluation contractors. Complete findings are detailed in the contractors' full evaluation reports, which will be available publicly in Q4 2014.



APPENDIX G

Business Programs

AUDIT FUNDING

This initiative provides participants with incentives for the completion of energy audits of electricity consuming equipment located in their facility. Energy audits include development of energy baselines, use assessments and performance monitoring and reporting.

Key Findings from Evaluation Report

- 319 audits were completed in 2013.
- More recommended measures were implemented without incentives in 2013 (33 percent in 2013 compared to 13 percent in 2012).
- The average per-audit summer peak-demand savings is estimated to be 13 kW.

DEMAND RESPONSE 2

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

Key Findings from Evaluation Report

- There was no evaluation of this initiative in 2013. The evaluation was completed in 2012 and there were no new participants in 2013.

DEMAND RESPONSE 3

This initiative is for commercial and industrial customers 50 kW or greater to reduce the amount of power used during certain periods of the year. It is a contractual resource that provides an economic alternative to procuring new peak generation capacity. DR3 comes with specific contractual obligations requiring participants to reduce their use of electricity relative to a baseline when they are requested to do so. Participants are paid to be on standby and receive 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 in that year, depending on their contract. DR3 is delivered by demand response providers (DRP) under contract to the OPA. The OPA administers contracts with all DRPs and contracts directly with participants that provide more than 5 MW of demand-response capacity. The OPA also provides administration including settlement, measurement and verification, and dispatch. LDCs provide outreach and marketing efforts.

Key Findings from Evaluation Report

- The largest 20 contributors account for 60 percent of the contractual demand reduction – that is, less than five percent of contributors account for the majority of the load reductions.
- In 2013, DR3 was successfully dispatched locally for the first time to provide assistance in restoring power after a prolonged power outage due to substation flooding.



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

- There were 29 unique participants in 2013.
- No commissioning projects completed the hand-off/completion phase in 2013.
- Improvements to the chilled water system controls were the most commonly targeted measure.
- There was a large variation in the estimated savings results between the preliminary investigation phase and the actual implementation phase.

HIGH PERFORMANCE NEW CONSTRUCTION (HPNC)

This initiative provides incentives for new buildings to exceed existing codes and standards for energy efficiency. It uses both a prescriptive and custom approach.

Key Findings from Evaluation Report

- Energy and demand savings for this initiative increased by 300 percent compared to the combined 2011 and 2012 results. The 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 and 2012
- A realization rate of 72 percent for energy savings is low due to the low realization rate of the agribusiness high-ventilation, low-speed fans which comprised 15 percent of the program's prescriptive project energy savings.
- The net-to-gross ratio for the initiative increased by 14 percent – from 49 percent in 2012 to 63 percent in 2013. This is related to the increase in the number of custom projects which have a higher net-to-gross ratio.



APPENDIX G

Business Programs

INDUSTRIAL ACCELERATOR

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

Key Findings from Evaluation Report

- There was no process evaluation of INDUSTRIAL ACCELERATOR in 2013; impact evaluation was completed. The impact evaluation determined that high realization rates were very high, such that projects delivered the savings expected.

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 single-family homes that are efficient, smart and integrated. Incentives are provided in two categories: incentives for home builders who install energy-efficient measures as determined by a prescriptive list or through 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's province-wide marketing driving builders to their LDC for additional information.

Key Findings from Evaluation Report

- The number of projects increased by 25 percent, from 69 in 2012 to 86 in 2013.
- Custom projects, representing only about eight percent of the total number of projects, accounted for 67 percent of the verified demand savings and 54 percent of the verified energy savings.
- The net-to-gross ratio for the initiative increased by 5 percent – from 49 percent in 2012 to 54 percent in 2013



APPENDIX G

Business Programs

PROCESS & SYSTEMS UPGRADE INITIATIVE (PSUI)

The PSUI is designed to help facilities identify and realize major energy savings. It includes financial incentives and technical expertise needed to upgrade key systems and make improved energy management a part of how Ontarians do business. The program has two complementary streams: energy-efficiency upgrades, which include 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

- In 2013, three PSUI projects came into service. Projects were very well documented and technical reviews were thorough. Most projects were delivering the level of energy savings expected or more, with realization rates of 87 percent for energy savings and 86 percent for summer demand savings.
- The measurement and verification conducted in each project is rigorous. The level of free-ridership was found to be very low, at only seven percent for energy savings and six percent for demand savings. No spillover was identified.
- Energy managers were seen as important drivers of program-enabled savings projects. The amount of energy savings from program-enabled savings projects increased by nearly 300 percent from 2012.

RETROFIT PROGRAM

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 as 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 LDCs.

Key Findings from Evaluation Report

- A total of 8,785 projects were completed in 2013. Reported energy savings for individual projects ranged from 1 kWh to over 5,000,000 kWh.
- The net-to-gross ratio was 72.8 percent for energy and 72 percent for demand. Both are consistent with prior years and are comparable to similar programs across North America.



APPENDIX G

Business Programs

SMALL BUSINESS LIGHTING

This initiative helps businesses achieve savings through the provision and 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 <50 kW account category and offers turn-key lighting and electric hot-water heater measures. This initiative is delivered through LDCs.

Key Findings from Evaluation Report

- In 2013, the initiative introduced an increase in the incentive to \$1,500 from \$1,000, and added new LED measures and agribusiness eligibility.
- 17,782 projects were completed in 2013 (a 3.8 percent decrease from 2012).
- There was a 2.2 percent increase in the net verified energy savings compared to 2012.
- The average incentive per project and savings per project both increased from 2012 to 2013.
- The net-to-gross ratio for 2013 remained unchanged at 94 percent.

Note:

The key evaluation findings are derived from the 2013 evaluations of the **saveONenergy** programs. These findings were developed by third-party evaluation contractors. Complete findings are detailed in the contractors' full evaluation reports, which will be available publicly on the OPA website in Q4 2014.

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