



2011 Conservation Results

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Message from Vice President, Conservation



To our valued customers and partners,

The Ontario Power Authority (OPA) is pleased to provide the 2011 Conservation Results Report. This report provides insight into 2011 conservation programs and information on new innovative projects and technologies supported through the Conservation Fund.

From 2006 to 2011, conservation programs have seen an investment of \$2.0 billion and have saved customers \$4.0 billion in avoided costs. **Overall, 2011 conservation programs in Ontario influenced 717 million kWh of verified and sustainable annual energy savings yielding a program cost to consumers of 3 cents per kWh.** The most cost effective year to date.

In 2011, centrally coordinated and collaboratively delivered **saveONenergy** suite of conservation programs with our local distribution partners exceeded our 2011 forecasts and generated 216 MW of demand reduction and 606 GWh of energy savings for the province. This includes savings from energy efficiency and demand response initiatives offered province-wide through the suite of **saveONenergy** programs.

Ontario's conservation efforts are helping families and businesses across the province become more active in reducing their energy consumption. **Ontarians have conserved more than 1,900 MW of electricity since 2005, the equivalent of removing over 600,000 homes from the grid.** Ontario is continuously investing in and piloting new innovative technologies and programs that are cost-effective and reduce greenhouse gas emissions – ensuring that both Ontarians and the electricity system benefit from energy saving initiatives.

We hope you enjoy reviewing our progress through this report. Our conservation results demonstrate how the OPA's conservation team and its partners, including all local distribution companies, are innovating for the future and providing value to our customers and the province. The results have also helped inform our suite of **saveONenergy** programs, which help customers better manage their energy consumption. Please visit saveonenergy.ca for more information on how we are helping Ontarians conserve.

Sincerely,

A handwritten signature in dark ink, appearing to read 'APride'.

Andrew Pride, P.Eng.

Vice-President, Conservation

The OPA has a leadership role in helping Ontario meet its long-term energy targets. Ontario has an aggressive long-term energy target of achieving 7,100 MW of peak electricity demand reductions and 28 billion kWh in annual energy use by the year 2030. Interim provincial energy targets are also included for the 2015, 2020, and 2025 periods.

Conservation

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

Conservation programs are a group of initiatives offered under the **saveONenergy** brand which are collaboratively delivered with LDCs or offered directly by the OPA to consumers. Conservation programs encourage homeowners and businesses to reduce their energy use, support the province in meeting its provincial energy targets and reduce greenhouse gas emissions. Initiatives within the **residential and business streams** span across all customer segments and include incentives for energy and demand saving activities. Energy-efficiency initiatives are a group of incentive programs designed to help residents and businesses better manage their electricity consumption. Demand response is a program that rewards customers for reducing their consumption during times of critical peak in electricity. **Provincially, programs offered by both the OPA directly and through the LDCs, we achieved 645 MW of demand reduction and 717 GWh of energy savings.**

This report highlights conservation results from all programs and provides information on other conservation initiatives such as the achievements of the Conservation Fund, which supports innovative projects and technologies across every sector within the province. This report also includes information on codes and standards, time-of-use rates and other influenced conservation, which contributes to the overall energy and demand savings for the province's long-term energy target.

All programs implemented by the OPA in 2011 were subject to the independent evaluation, measurement and verification (EM&V) process. The EM&V process involves undertaking activities aimed at assessing the resource savings, cost-effectiveness and market impacts of each program. Assessing performance through the EM&V process allows the OPA to transparently report on the energy savings and demand reduction achieved. This report provides a summary of the detailed EM&V reports which can be viewed on the OPA website at powerauthority.on.ca.

Residential Programs



Initiatives available to Ontario residents achieved **53 MW** of peak demand reductions and saved **143 GWh** of energy in 2011.

Savings were achieved through residents participating in the **FRIDGE & FREEZER PICKUP**, having their older, inefficient appliances removed from their homes; redeeming **COUPONS** for energy-efficient products at thousands of retailers across the province; using incentives to upgrade their **HEATING & COOLING** systems; and the **HOME ASSISTANCE** program offering energy-efficient product upgrades. Residents also participated in the **peaksaver®** initiative - reducing the demand for electricity during peak hours throughout the day by using load control devices on certain appliances such as air conditioners to adjust the temperature within their home.

Program Highlights:

- Over **56,000** inefficient fridges, freezers, and window air conditioners and dehumidifiers were picked up and recycled
- Over **550,000** coupons were redeemed by Ontarians purchasing energy-efficient products
- Over **300** retail stores participated in the **EXCHANGE EVENT**
- Over **111,000** energy-efficient air conditioners or furnaces were installed through the heating and cooling initiative – of the new heating, ventilation and air conditioning (HVAC) systems installed in Ontario, over 50% used the **HEATING & COOLING INCENTIVE**
- Over **19,000** new load control devices were installed through **peaksaver**

Business Programs



Initiatives available to Ontario businesses achieved **591 MW** of peak demand reductions and saved **574 GWh** of energy in 2011.

Initiatives for businesses include small businesses, commercial, industrial, institutional and agricultural facilities. Savings were achieved through businesses implementing energy-efficient products and systems into new and existing buildings. A variety of upgrades were undertaken, such as lighting and heating and cooling systems. Businesses also participated in **DEMAND RESPONSE** by reducing electricity use during peak. This was done by businesses shifting their electricity use to off peak times or reducing their electricity consumption by a specific amount over a one year period.

Program Highlights:

- Over **20,000** upgrades were completed through **SMALL BUSINESS LIGHTING**
- Over **2,000** energy-efficient projects were completed through the **RETROFIT PROGRAM**
- Over **40** applications for **Embedded Energy Managers** have been approved for funding.
Embedded Energy Managers are hired to identify energy saving opportunities within commercial and industrial facilities
- The OPA offers a variety of **saveonenergy TRAINING & SUPPORT** initiatives. These initiatives provide businesses with the opportunity to save money and become more energy efficient in their daily operations. More information on these initiatives can be found at **saveonenergy.ca/business**

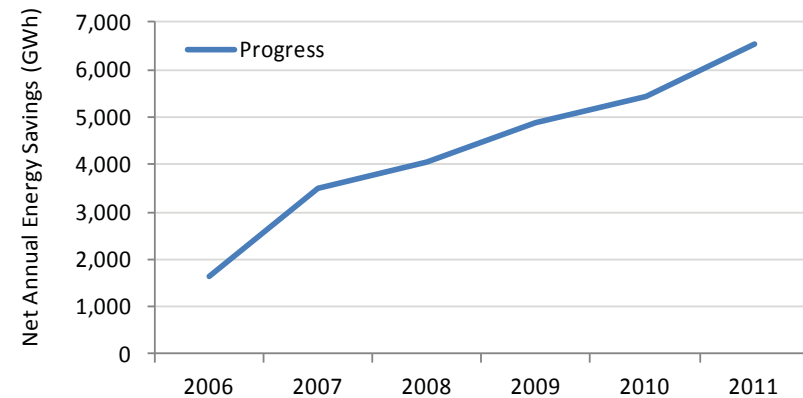
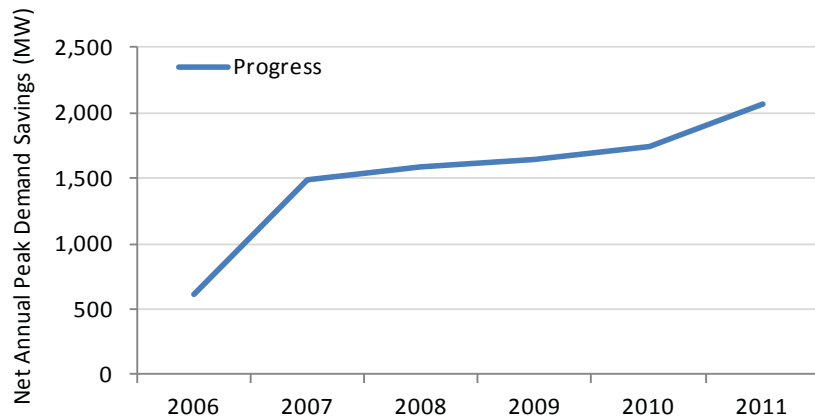
Conservation Program Savings

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; 7,100 MW by in demand reduction and 28 TWh in energy savings by 2030, with interim energy targets set for 2015, 2020 and 2025. The table and graph below indicate the province's 2011 savings and progress towards the Long Term Energy Plan.

Table 1 - 2011 OPA Province-wide savings

Savings	Gross Peak Demand Savings (MW)	Gross Energy Savings (GWh)	Net Peak Demand Savings (MW)	Net Energy Savings (GWh)
Demand Response	639	71	498	71
Energy Efficiency	229	1,015	147	646
Grand Total	868	1,086	645	717

Graph 1 - Progress to Long Term Energy Plan



Conservation Initiatives

Ontario's conservation programs benefit customers by providing tools and information to help them reduce energy costs and better manage their energy consumption. Below is a full list of initiatives, available to all Ontarians, which includes information on delivery method, energy and demand savings, and participation.

Table 2 - 2011 Province-wide initiative savings

Programs	Initiatives	Delivery	Net Demand Savings (MW)	Net Energy Savings GWh	Participation	Metric
Residential	FRIDGE & FREEZER PICKUP	Contractors	4	25	56,110	Appliances
	HEATING & COOLING INCENTIVE	Contractors	34	64	111,587	Installations
	<i>peaksaver</i> (Residential Demand Response)	LDCs	11	0 •	19,550	Devices
	COUPONS	Retailers	1	23	559,462	Products
	EXCHANGE EVENT	Retailers	0	0	3,688	Appliances
	SPRING & FALL EVENT	Retailers	2	31	870,332	Products
Business (Commercial & institutional, industrial, and agricultural facilities)	DEMAND RESPONSE 2	Aggregators	69	56	2	Facilities
	DEMAND RESPONSE 3	Aggregators	315	15	476	Facilities
	SMALL BUSINESS LIGHTING	LDCs	25	65	20,297	Projects
	<i>peaksaver</i> (Small Commercial Demand Response)	LDCs	0	0	132	Devices
	RETROFIT PROGRAM	LDCs	31	177	2,949	Projects
	AUDIT FUNDING	LDCs	0	0	103	Audits
	HIGH PERFORMANCE NEW CONSTRUCTION	LDCs	6	29	155	Projects
	NEW HOME CONSTRUCTION	LDCs	0	0	7	Projects
	Industrial Accelerator	OPA	0	1	2	Projects
	Pre-2011 Projects*	LDCs & service providers	42	231	-	-
	Pre-2011 <i>peaksaver</i> Residential		100	0	167,770	Devices
	Pre-2011 <i>peaksaver</i> Business		3	0	4,657	Devices
	TOTAL		645	717		

* Includes LDC custom programs (Data Centre Incentive program and EnWin Green Suites), Electricity Retrofit Incentive Program, Multi-family Energy Efficiency Rebates and Toronto Comprehensive (Toronto Hydro Business Incentive Program, The City of Toronto Better Buildings Partnership Program, and Building Owners and Managers Association Conservation and Demand Management Program).

• A savings result of "0" represents a result of less than .5 MW/GWh.

Evaluating Conservation's Cost Effectiveness

Table 3 - Cost Effectiveness Tests

Total Resource Cost Test	2011
Benefit (\$million)	623
Cost (\$million)	521
Net Benefit (\$million)	102
Net Benefit Ratio	1.2

Program Administrator Cost Test	2011
Benefit (\$million)	569
Cost (\$million)	269
Net Benefit (\$million)	300
Net Benefit Ratio	2.1

2011 Levelized Delivery Cost (DR)
\$12,430/MW month
2011 Levelized Delivery Cost (EE)
\$30.68/MWh (3 cents /kWh)

The Ontario Power Authority's 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.

- **The Total Resource Cost Test** looks at cost-effectiveness from a **societal perspective** that includes all incremental customer equipment costs and program costs. TRC benefits include net verified electricity and other associated savings (i.e. natural gas).
- **The Program Administrator Cost Test** considers cost effectiveness from the **perspective of a program administration agency**. It includes the incentive costs, program costs and the verified net electricity savings (benefits) of the initiative.
- **The Levelized Delivery Cost Metric** provides a basis for **comparing energy-efficiency programs with other electricity supply resources**. The metric expresses delivery costs (all costs associated with designing, delivering and evaluating a program) per unit of energy saved on an annualized basis in terms of \$/MWh. It accounts for the energy savings that persist over the minimum expected useful life of all technologies and initiatives associated with the implementation of a conservation program. Demand response costs similar to peak generation resources is expressed in \$/MW-month.

Cost-effectiveness tests take a conservative approach to comparing the costs and benefits to customers. Gross costs are calculations of all the delivery costs associated with delivering programs and incentives, while benefits are the net savings resulting from conservation actions undertaken by a customer who was directly influenced by a conservation program. The benefits also consider the minimum expected lifetime of conservation projects and technologies. A more detailed explanation of these tests can be found in appendix B.

A conservation program is considered to be cost-effective if the net benefit (benefits - costs) is greater than zero and the net benefit ratio (benefits/costs) is greater than one. The ability to demonstrate cost-effectiveness reinforces that conservation is a valuable resource for Ontario as it defers the need to invest in more expensive forms of electricity infrastructure. In 2011 it was demonstrated that the portfolio of province-wide conservation programs were cost-effective from both a societal and a program administrator perspective.

Supporting Innovation Through The Conservation Fund



Fund Highlights

Results and findings from Conservation Fund projects directly influenced 14 **saveONenergy** initiatives

Increased efficiencies and improved customer service – intake processes were revised and a dedicated support toll free number was implemented to better direct customer questions

The fund currently has 55 active projects valued at \$14M

Pilot projects supported through the Conservation Fund drive the implementation of energy-saving measures and support innovative systems and technologies across the province. The fund is also helping transform the market by enabling customers to adopt conservation activities into their daily routine.

Since 2005, the Conservation Fund has committed **\$28.8M of support to 167 projects**. These projects have **leveraged an additional \$101.5M** in partner support. In 2011, the fund committed \$3.96M to 15 new projects. These 15 new projects are contributing to overall energy savings, informing policies and programs, and promoting awareness of innovative conservation activities.

2011 was a year of transformation for the fund. The conservation and technology development funds were merged to create an expanded Conservation Fund. Intake processes were revised and streamlined and a new model of engagement was instituted. These changes are maximizing resources and bolstering the decision-making process, while accelerating the innovative concepts captured in the projects.

2011 was also an exciting year as many projects moved from the pilot stage to full deployment, generating more energy savings for the province. Many of these pilot projects also influenced initiatives within the suite of **saveONenergy** programs, which help home and business owners better manage their energy consumption.

The Conservation Fund demonstrates value for Ontario by providing innovative tools and information to influence long-term behavioural change, and ultimately helping customers make informed decisions when it comes to conserving energy.

CONSERVATIONFUND

Conservation Fund Projects

The Conservation Fund supports innovative electricity conservation projects that: build marketplace capacity, test new or unique program elements, verify the energy savings potential and cost-effectiveness of novel demand side technologies and processes, and can be scaled-up to achieve significant energy savings in Ontario. Conservation Fund projects have one of two areas of focus: they are either large projects focused on piloting and verifying well-conceived conservation initiatives, or are smaller initiatives focused on the development of very specific tools or approaches. Here are just a few examples of the fund at work.

The Greater Toronto CivicAction Alliances's Race to Reduce is a four-year challenge aimed at reducing total energy use in participating office buildings by at least 10 percent. The challenge reflects collaboration between commercial landlords and tenants to promote smart energy use.



The Living Planet @ Work (LP@W) program provides strategic guidance, green business ideas, free tools and support to empower companies in rethinking their operations and finding more sustainable ways of doing business. But most importantly, Living Planet @ Work helps companies engage employees on conservation.



Green Light on a Better Environment (GLOBE) is developing a utilities management program tool for the low-income social housing sector. This tool will enable energy performance benchmarking and assist housing providers in improving insight on building performance.



CONSERVATIONFUND

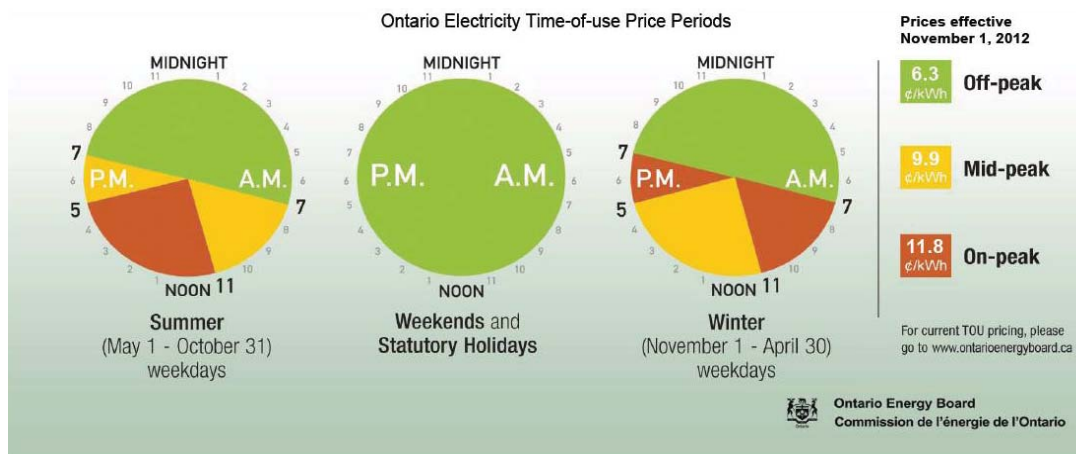
About Time-of-Use Pricing

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. These prices were developed by the Ontario Energy Board (OEB) for low-volume electricity consumer (households and small businesses) as part of the Regulated Price Plan (RPP) for customers with smart meters. 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”).

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 August 31st, 2012 99% of RPP customers have smart meters, and 91% of them are on TOU rates.

There are three different TOU prices as shown on the chart below. 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.

Local distribution companies are working with the Ontario Power Authority to test approaches and implement a savings reporting regimen for 2014. Some initiatives include energy displays that are already helping to inform consumers about time of use pricing.



(Ontario Energy Board)

http://www.ontarioenergyboard.ca/OEB/_Documents/B-2012-0003/CDM_Guidelines_Electricity_Distributor.pdf

About Other Influenced Conservation

Other influenced conservation is the result of conservation activities by organizations and programs not funded by the Ontario Power Authority which result in electricity savings. The purpose of reporting other influenced conservation is to provide information on overall provincial conservation savings and conservation savings achieved from other agencies and utilities.

Results represent the conservation efforts of the federal government and the gas utilities in Ontario. The results exclude OPA funded programs, Ontario Building Code, federal and provincial minimum energy performance regulations and rate structures, all of which are evaluated and reported separately. It should be noted that these results are reported as provided by each organization with no adjustments or changes. There has not been a formal verification by the OPA with these numbers and the level of accuracy will vary with each organization's evaluation methodology.

Table 4 - 2011 Other Influenced Program Results

Organization		Incremental Energy Savings (GWh)
Gas Utility	Enbridge Gas	52.2
Gas Utility	Union Gas	32.8
Federal Government	NRCan	52.3
Total		137.3

NRCan's ecoENERGY Efficiency for Buildings Program provides a large amount of resources on energy efficiency in buildings, including training, information tools, and design validation.

Many of Enbridge's and Union's energy efficiency programs generate both natural gas and electricity savings – for example, Enbridge's Energy Solution Consultants and Trade Allies work together with customers to promote the installation of advanced building control systems leading to energy savings.

About Codes and Standards

Codes and standards include building codes that mandate energy-efficiency requirements, set standards for new building construction and major renovations, and set minimum energy performance standards for equipment and appliances.

Amendment 11 to the **Federal Energy Efficiency Regulations** was published in October 2011 and came into force in 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.

According to analysis conducted by Natural Resources Canada, these regulations are expected to save Canadian consumers 4.9 petajoules (PJ) of energy annually by 2015, increasing to annual savings of 11 PJ in 2030. In Ontario, the regulations should reduce energy consumption in 2015 by approximately 1.5 PJ, or the equivalent of 420 GWh/year in gas and electricity savings.

Enhanced energy-efficiency benchmarks were established in **Ontario's 2006 Building Code**, which set out a "roadmap" for energy efficiency to be implemented from Jan. 1, 2006 through to Dec. 31, 2011. In 2011, the Ontario Ministry of Municipal Affairs and Housing updated Supplementary Standards to the Ontario Building Code which described compliance paths for enhanced energy-efficiency requirements for both houses and large buildings.

Public and stakeholder consultations took place on potential future changes to the Code for the next round of Code changes. The government has been reviewing this input and recommendations from the Building Code Technical Advisory Committees, and the development of the next edition of the Building Code is underway.

At the federal level, the **National Energy Code for Buildings** 2011 was published and succeeds the 1997 edition of the Model National Energy Code of Canada for Buildings. The National Energy Code for Buildings sets out minimum requirements for the design and construction of energy-efficient buildings. It does not have legal standing on its own, but may be referenced in future editions of Ontario's Building Code or in energy-efficiency programs.

In 2011, **ENERGY STAR®** was active in both product and building labeling. Specifications were created or revised for a number of product categories, and the ENERGY STAR for New Homes program published technical specifications for the Ontario market. To encourage energy benchmarking in commercial buildings, Natural Resources Canada signed an agreement with the U.S. Environmental Protection Agency to harmonize and enhance the EPA's existing ENERGY STAR Portfolio Manager software tool to track and rate the energy performance of Canadian commercial buildings, in addition to buildings in the U.S. It is scheduled to be launched in 2013.

“Codes and standards are a powerful, cost effective tool for achieving energy savings and building a culture of conservation in Ontario.”

Culture of Conservation



The Ontario Power Authority's culture of conservation metric identifies customers attitude towards energy conservation by identifying the key influences driving the culture and establishing a measurable goal for progress.

In 2009, the OPA began measuring the culture of conservation in Ontario to benchmark and assess its progress over time. It has become a unique research project in North America that goes beyond simply reporting attitudes toward energy conservation, by identifying the key influences driving the culture of conservation and establishing a measurable goal for progress. The project was meant to complement measurement of resource acquisition initiatives and marketing strategies and to provide a holistic measure of market transformation in Ontario. It can also serve as a leading indicator of public acceptance of energy-related codes, standards and policies.

In 2011, the OPA continued to measure the culture of conservation in Ontario. Results are positive: the score representing overall engagement with energy conservation among Ontarians remains higher than in 2009. Of particular note people are increasingly concerned with the environmental impacts of consuming energy. This market research also identified ways to accelerate the culture of energy conservation in the province, notably by ensuring a strong, sustained and consistent public profile. The OPA conservation messaging (as measured through the OPA's research) has been effective, but requires support by increasing the public profile for energy conservation across a broad spectrum of platforms. A highly visible conservation message is likely to create momentum and accelerate growth of a culture of energy conservation in Ontario.

Ontario Culture of Energy Conservation Metric



saveONenergy



The **saveONenergy** brand was introduced in 2011 in support of the province-wide conservation programs. By the end of 2011, the brand reached significant market recognition with 5 out of 10 Ontarians being aware of the brand and the information it provides to customers. The **saveONenergy** website attracted 700,000 visitors and many LDCs leveraged the customizable options for their own use on corporate websites to help further increase awareness with customers.



In 2011, the Ontario Power Authority conducted its fourth annual Energy Conservation Attitude & Behaviour public opinion survey. It shows that **Ontarians are more knowledgeable and sophisticated about managing home electricity use than in the past**. The market research suggested that a messaging strategy surrounding “we’ve done a lot and we can DO MORE” would be effective in recharging customers motivation.

In 2011, the OPA also updated the understanding of the types of people in Ontario, based on their engagement with electricity conservation, their motivations and the opportunity to influence each other to further the culture of energy conservation in the province. The segments were based on these dimensions: Self Empowerment, Personal Benefit, Societal Benefit, and Awareness & Action. This segmentation will be used to inform the next generation of conservation messaging and to establish a common language with LDCs and other stakeholders.



The OPA continues to conduct weekly research into the awareness, attitudes and behaviours of Ontarians toward electricity and conservation programs, building upon the results of previous years. The results of this weekly research are used to track trends, inform the refinement of existing programs, and also inform the design and development of future programs. This research showed that **saveONenergy** built a substantial level of awareness (up to 61%, greatly exceeding its 2011 target). In its first year it built a positive reputation among the Ontario public with roughly 6 in 10 agreeing it can save money and provide information that encourages customers to take responsibility for the amount of energy used in their homes.

Many supporting initiatives contributed to the awareness of **saveONenergy**. In addition to designing, delivering and marketing conservation programs, the OPA promotes energy efficiency by delivering conservation information and tips and tools to help customers save more. In 2011, the **saveONenergy** PLEDGE, developed to encourage Ontarians to take simple steps towards reducing energy, resulted in 110,000 Ontarians committing to reduce their energy consumption.

saveONenergy^{OM}

Conclusion



2011 was a successful year. Overall, conservation programs influenced 717 million kWh of verified and sustainable energy savings and yielded an overall program cost to consumers of 3 cents per kWh, our most cost-effective year. In addition, 137 million kWh were reported by gas companies and the federal government.

From 2006 to 2011, conservation programs have seen an investment of \$2.0 billion, have **saved customers \$4.0 billion in avoided costs**, and have achieved over 1,900 MW of demand savings. The 2011 conservation results indicate that LDC delivered programs exceeded OPA's 2011 forecasts and achieved 216 MW of demand savings and 606 GWh of energy savings. LDC and OPA delivered conservation programs achieved 645 MW of demand savings and 717 GWh of energy savings.

Many initiatives within the suite of **saveONenergy** programs achieved positive participation rates contributing to greater energy savings for the province. A successful component of the residential programs was **leveraging retailer and contractor networks**. Using these delivery partners in conjunction with LDC marketing and communication efforts created significant reach to consumers - over 50% of newly installed furnace and air conditioners in Ontario used the **saveONenergy** program. The commercial and institutional program had a higher degree of net savings due to **improvements in the eligibility requirements of programs**. Many of the business focused initiatives achieved an increase in participation and made a considerable contribution to the 2011 savings.

2011 also marked a successful year with the launch of **saveONenergy** - the new brand in support of the province-wide 2011-2014 conservation programs. By the end of 2011 the **saveONenergy** brand reached significant market recognition with **5 out of 10 Ontarians being aware of the brand** and the information it provides to customers. The **saveONenergy** website attracted 700,000 visitors (50,000 being business visitors) and had over **3 million page views by the end of 2011**.

The Ontario Power Authority is committed to ensuring that the electricity needs of Ontario are met both now and in the future by working with partners to design and deliver new energy saving initiatives for homes and businesses, funding new innovative projects through the Conservation Fund and engaging the public to identify the attitudes and behaviours towards electricity in the province. All of these initiatives and more contribute to a **culture of conservation** across the province and benefit all Ontarians by reducing the need to build more expensive future generation, **helping customers better understand their energy** consumption, and helping the province meet its long-term energy targets.

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 Ontario Power Authority 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 2011. It does not include savings from building codes, appliance and equipment standards, provincial and federal government programs, smart meter and time-of-use implementation, and customer-based generation, which contribute as well 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 the FIT and microFIT programs are separately metered for the purpose of injecting electricity into the grid.



Appendix A - 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 \$/MW-month, respectively, taking into account the lifetime energy savings associated with the implementation of a Conservation and Demand Management initiative.

Contracted Capacity

Megawatt capacity under contract with demand response participants.

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 B - Cost-Effectiveness

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 C - 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. In 2011, booklets were directly mailed to customers and were also available at point-of-purchase. Downloadable coupons could also be found at saveonenergy.ca. This initiative is delivered by the OPA contracting centrally for the distribution of the coupon booklets across Ontario. LDC also distribute coupons at local events. The OPA entered into agreements with specified retailers to honor the coupons.

Key Findings from EM&V Evaluations

- *Customers redeemed nearly 210,000 coupons*
 - *Majority of the coupons redeemed were for CFLs*
 - *It is believed that the market has largely been transformed to CFLs. As a result of this observation, special attention will be given to the 2012 evaluation of this initiative.*
-

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 EM&V Evaluations

- *Customers redeemed nearly 370,000 coupons, translating to over 870,000 products*
- *Majority of coupons redeemed were downloadable (40%)*
- *It is believed that the market has largely been transformed to CFLs. As a result of this observation, special attention will be given to the 2012 evaluation of this initiative.*

Appendix C - Residential Programs

EXCHANGE EVENT

This initiative permanently decommissions older, inefficient window air conditioners and portable dehumidifiers within 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 EM&V Evaluations

- *Approximately 96% of consumers reported having replaced their exchanged unit (as opposed to retiring the unit)*
 - *Participation declined 36% from 2010 and it is believed that this initiative is reaching market saturation. Special attention will be given to the 2012 evaluation*
-

FRIDGE AND FREEZER PICKUP

This initiative facilitates the removal of older inefficient appliances from customers within 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 EM&V Evaluations

- *97% of the net resource savings were achieved through the home pick-up stream (66% refrigerators, 30% freezers, 4% dehumidifiers and window air conditioners)*
 - *3% of the net resource savings were achieved through the retailer-pick up stream (90% refrigerators, and 10% freezers)*
 - *Participation declined 17% from 2010 and it is believed that this initiative is reaching market saturation. Special attention will be given to the 2012 evaluation*
-

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 EM&V Evaluations

- *Total air conditioner and furnace installations increased by 14% from 2010. With 95,800 units in 2010 to 111,500 units in 2011*
- *The Heating and Cooling incentive continues to deliver the majority of the savings in the consumer program*
- *Furnace upgrades accounted for over 91% of the energy savings for this initiative*

Appendix C - Residential Programs

Peaksaver®

The *peaksaver* 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 EM&V Evaluations

- *Over 19,000 devices were installed in 2011*
- *99% of the new devices enrolled control residential central AC units*

Appendix D - Business Programs

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 EM&V Evaluations

- *Initiative was not evaluated in 2011*
-

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 with a value up to \$1,000, at no cost to qualifying small businesses. In addition, standard prescriptive incentives are available for eligible equipment beyond the initial \$1,000 limit. This initiative is delivered through LDCs, participants enroll directly with the LDC, or would be contacted by the LDC/LDC-designated representative.

Key Findings from EM&V Evaluations

- *This initiative performed above expectations*
 - *Over 35% of the projects for 2011 included at least one CFL measure*
 - *Participation continues to decline year over year as the initiative reaches market saturation*
-

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 EM&V Evaluations

- *Strict eligibility requirements and improvements in the pre-approval process contributed to the higher net to gross ratio*
- *Gross verified savings were boosted by lighting projects in the prescriptive and custom measure tracks*

Appendix D - 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 the LDCs.

Key Findings from EM&V Evaluations

- *Initiative was not evaluated in 2011*
-

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 EM&V Evaluations

- *Initiative was not evaluated in 2011*
-

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 EM&V Evaluations

- *Initiative was not evaluated in 2011*

Appendix D - Business Programs

Industrial Accelerator

Industrial Accelerator 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 within a set period of time and to maintaining them over the expected life of the project.

Key Findings from EM&V Evaluations

- *Initiative was not evaluated in 2011*
-

DEMAND RESPONSE 2

Demand Response 2 (DR2) is a contractual load shifting program in which participants specify the load shift window and amount of load shifting.

Key Findings from EM&V Evaluations

- *In 2011, there were two contributors with a combined 67 MW of Ex Ante load reductions and 52 GWh of energy savings*
 - *Overall, electricity consumption for DR-2 participants is approximately 30% lower than their consumption prior to enrolling in DR-2*
-

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 EM&V Evaluations

- *Program performance increased with participants providing 75% of contracted MW for both sectors*