

Electricity Conservation Program Results

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Abstract: 2015 Electricity Conservation Program Results

The 2015-2020 Conservation First Framework (CFF) was established by the March 31, 2014 Directive to the then Ontario Power Authority (OPA) by the Minister of Energy. The framework mandates Local Distribution Companies (LDCs) to offer conservation programs that reduce electricity consumption “as far as is appropriate and reasonable” to its individual customer segment. This was expected to give LDCs more flexibility to align their program offerings to local needs and provide more customer choice while remaining cost-effective in the delivery of their CDM programs.

The Directive also established that energy savings would be counted on the basis of persistence throughout the course of the framework (i.e., only conservation measures still delivering savings at the end of 2020 will count towards targets). In essence, this placed more importance on conservation programs which have a longer life and result in deeper savings for the province. While this change in savings calculation means that the province will see measures that lead to savings for longer periods of time, it will discourage the implementation of any programs that see short-term savings as those will not be counted in the LDCs’ targets. This makes sense as reducing energy use is less critical in the next few years, given the province’s strong short-term supply position. Longer-lasting conservation projects put in place today have more value, as they will help avoid new generation in future years.

Previously, utility conservation programs focused on both overall electricity savings and reducing electricity use specifically at times of system peak. However, reducing peak electricity demand through targeted demand response initiatives is now solely the Independent Electricity System Operator’s (IESO)

responsibility, and was moved to a market-based auction system starting in late 2015. Therefore, LDCs are no longer accountable for the more difficult and more critical peak reduction targets.

The Value of Conservation

The province is currently about halfway through its second full multi-year CDM framework, and conservation still remains the cheapest form of energy. The cost of conservation is 3.5 cents/kWh compared to hydro generation at 5.8 cents/kWh, nuclear generation at 6.6 cents/kWh, 17.3 cents/kWh for gas generation and between 15-50 cents/kWh for renewable generation (solar, wind and bio energy). In 2015, a total of \$429 million was recovered from Ontario's ratepayers through the Global Adjustment Mechanism (GAM). This represents about 4.3% of the total GAM charged on electricity bills in 2015 and about 2% of the total electricity cost for the province. These percentages are in line with previous years and conservation still amounts to a very small part of the electricity bill for Ontario's ratepayers. Therefore, conservation is still adding significant value at a much cheaper price for Ontario and will become more critical to the system as the province's nuclear refurbishments and Pickering shutdown get underway.

Overall Performance

In 2015, considered a transition year, the province's LDCs achieved 1117 GWh of net energy savings, which represents 16% of the 6-year target. As such, LDCs collectively are on pace to meet their 2020 target. Of these savings, 95% can be attributed to CDM programs from the 2011-2014 CDM framework that were started in 2014 but completed in 2015 and the energy savings being counted in the new framework's results. There was a 15% increase in results from the performance in the last year of the 2011-2014 results, which indicates that the transition between frameworks went smoothly.

Performance by Sector

The Business Programs contributed close to 65% of the year's savings, with the Retrofit Program leading the way. Other programs that performed well are the Coupon Program, the HVAC Program, the Energy Manager Program and the Project Incentive Initiative. Some programs such as the Small Business Lighting Initiative and the Home Assistance Program saw a decrease in results but policy and program changes have been made to encourage participation in subsequent years. One issue that needs to be addressed is the role of combined heat and power. Many utilities are counting on combined heat and power projects to help meet their 2020 conservation targets, but there is uncertainty about whether combined heat and power increases or reduces greenhouse gas emissions, and whether it should continue to be supported by conservation funding.

Spending in CFF

In total, the province spent \$432 million in the delivery of CDM programs. Of this, only \$22 million was from the LDC CDM plan budgets and about \$3 million was from the IESO's central budget; the rest was rolled over from the previous framework. Of the \$1.8 billion budgeted under the CFF CDM plans over the 2015-2020 period, only 1.2% was used in 2015. This means that LDCs now have almost 6 years' worth of

budget left to deliver 5 years' worth of programs, which undoubtedly should help LDCs in achieving their targets.

Cost-Effectiveness in CFF

The cost-effectiveness numbers for the first year of the Conservation First Framework were positive, with each dollar of spending yielding \$1.29 in benefits from a societal perspective, using the Total Resource Cost (TRC) test. The TRC number has improved slightly from last year, given the Ministerial Directive in December 2014 to add a 15% adder to the TRC calculation to account for non-energy environmental benefits. Therefore, while the numbers may look better, we cannot directly attribute this improvement to a reduction in costs or an increase in benefits to the province. The levelized cost of conservation for 2015 is 3.5 cents/kWh, which is slightly lower than the 2011-2014 figure of 3.7 cents/kWh, and far more cost-effective than any other form of generation, as mentioned earlier.

Local/Regional Programs

Unlike the last framework, this has seen a proliferation of innovation in conservation programming, with 17 local programs and 20 pilots approved to date. Another 15 pilots have been approved under the IESO's Conservation Fund which is separate from the CFF budget. During the last framework, the ECO had pointed out the lack of local/regional programs in the framework. The change in the approvals process and the establishment of clearer rules has made it much easier for LDCs to develop and test program ideas, which the ECO commends.

IESO-only Programs

The IESO has several programs that it administers directly for large customers. The Industrial Accelerator Program has seen dismal results to date (only 2% of target) and has had several changes made to it to increase participation through to 2020. The IESO is now also responsible for the demand reduction targets for the province. The Capacity Based Demand Response program, launched at the end of 2015, has seen an increase in participation from the DR 3 program. Ontario is aiming to use DR (including price-based initiatives such as ICI) to meet 10% of peak demand by 2025, equivalent to approximately 2,400 MW under forecast conditions. However, the future of peaksaver PLUS, which saw over 300,000 participants in the last framework, is still uncertain as the IESO has not moved forward with incorporating the program into its DR framework.

Next Steps in the Framework

Since the CFF has been launched, the Minister has given direction to amend some of the requirements for the framework. In December 2015, LDC were directed LDCs to include all province-wide programs in their CDM delivery, which is a change from the original directive that gave LDCs the flexibility to offer the programs they saw appropriate for their customer base. Following another Ministerial Directive, the IESO developed and launched a pay-for-performance multi-utility program in late 2016 and a whole home pilot in 2017. Both those programs are being delivered by other parties and not the LDCs- the pay-for-performance program by the IESO and the whole home pilot by the gas utilities.

In the next steps in the CFF, the IESO has completed its Achievable Potential Study which has concluded that the current funding and programs are sufficient for LDCs to meet the 7 TWH target. The results of this study will feed into the IESO's Mid-Term Review of the CFF, which is required to be completed by June 1, 2018.

6.1 Introduction

2015 was the first year of electricity conservation program operation under the new 2015-2020 Conservation First Framework (CFF) that was established by the March 31, 2014 Directive to the then Ontario Power Authority (OPA) by the Minister of Energy. This Directive instructed the OPA, now part of the Independent Electricity System Operator (IESO) to *“coordinate, support and fund the delivery of CDM {conservation and demand management} programs through the Distributors to achieve a total of 7 TWh reductions in electricity consumption between January 1 2015 and December 31 2020...”*¹ The new framework mandates each local distribution company (LDC) to offer conservation programs that reduce electricity consumption to its individual customer segments, *“as far as is appropriate and reasonable”*.

While conservation may also reduce peak electricity demand, there is no longer a peak demand reduction target for LDCs. Reducing peak demand through targeted demand response initiatives is now solely the IESO’s responsibility, and has been moved to a market-based auction system starting in late 2015.² As the ECO has stated in its last report, peak demand savings are more important than total energy savings in terms of power reliability and affordability.³ This separation of target responsibility creates a troublesome gap for the province as LDCs will have little incentive in the CFF to focus their energy savings during the peak hours of the day when conservation would displace gas-fired generation or reduce the need for new generation.⁴

The Directive also established that energy savings would be counted on the basis of persistence throughout the course of the framework (i.e., only conservation measures still delivering savings at the end of 2020 will count towards targets). This is a change from the 2011-2014 framework. The new framework therefore places more importance on conservation programs which have a longer life and result in deeper savings for the province. This makes sense as reducing energy use is less critical in the next few years, given the province’s strong short-term supply position. Longer-lasting conservation projects put in place today have more value, as they will help avoid new generation in future years. While LDCs are only responsible for energy savings and not peak demand savings anymore (see Table 6.1 for more details), it is generally understood that the 2015-2020 Conservation First framework targets are more aggressive and will require a higher level of energy savings for LDCs to achieve their targets.

A corresponding Directive was issued to the Ontario Energy Board (OEB) to amend distributor licenses to add a condition for each LDC to make Conservation and Demand Management (CDM) programs available in its service territory based on its individual customer segment compositions.⁵ This was expected to give LDCs more flexibility to align their program offerings to local needs and provide more customer choice while remaining cost-effective in the delivery of their CDM programs.

2015 was also considered as a transition year for the 2011-2014 Conservation and Demand Management Framework to allow for CDM programs that were not completed during the 4-year framework to be completed in 2015 and be counted towards the results of the new framework.

In 2015, the province’s LDCs achieved 1117 GWh of net energy savings, which represents 16% of the 6-year CFF target.⁶ In other words, LDCs collectively are on track to meet their 2020 target. As shown later,

almost 95% of those results can be attributed to CDM programs from the 2011-2014 CDM framework that were completed in 2015. The IESO indicated that the first year results have set a strong foundation for LDCs to achieve the target of 7 TWh by the end of the framework.⁷ The total expenditure on CDM programs, specifically the source of the funding, also reflects the fact that a significant portion of the results in 2015 came from the previous framework, as analyzed in Section 6.6 of this report.

6.1.1 The Value of Conservation

The province is currently about halfway through its second full multi-year CDM framework, and conservation still remains the cheapest form of energy. Ontario ratepayers pay more for any form of generation than conservation. The cost of conservation comes in at 3.5 cents/ kWh compared to hydro generation at 5.8 cents/kwh, nuclear generation at 6.6 cents/kwh, 17.3 cents/kwh for gas generation and between 15-50 cents/kwh for renewable generation (solar, wind and bio energy).⁸ In 2015, a total of \$429 million was recovered from Ontario's ratepayers through the Global Adjustment Mechanism (GAM). This represents about 4.3% of the total GAM charged on electricity bills in 2015 and about 2% of the total electricity cost for the province. These percentages are in line with previous years and conservation still amounts to a very small part of the electricity bill for Ontario's ratepayers. Therefore, conservation is still adding significant value at a much cheaper price for Ontario and will increase in importance as province's nuclear refurbishments and Pickering shutdown get underway, starting in late 2017-early 2018.

6.2 Comparing the two frameworks

As mentioned earlier, one of the major differences between the 2011-2014 CDM Framework and the 2015-2020 Conservation First Framework is that the current framework requires LDCs to achieve energy savings only, while the previous one included both energy savings and peak demand targets. Some of the major differences between the two frameworks are highlighted in the Table 6.1

Table 6.1. Comparing the 2011-2014 CDM Framework and the 2015-2020 Conservation First Framework

Key framework elements	2011-2014 Conservation and Demand Management Framework	2015-2020 Conservation First Framework
Duration	4 years +1 year transition (2015) to next framework	6 years (2015 is a transition year between the two frameworks)
Oversight	OPA and OEB	IESO
Target	Energy Savings: 6000 GWH of cumulative energy savings Peak Demand: 1330 MW reduction in 2014	Energy Savings: 7000 GWH (7 TWH) of persistent energy savings in 2020 Peak Demand: Not an LDC target anymore
Energy savings calculation	Cumulative Savings: sum of savings delivered in 2011, 2012, 2013, and 2014 combined, from	Persistent Savings: savings occurring in 2020, from

	measures installed at any time between 2011 and 2014 (rewards conservation activity in early years, which will deliver more years of savings that count towards target)	measures installed at any time between 2015 and 2020.
Budget	\$1.4 billion for LDCs +\$0.2 billion for IESO central services ⁹	\$1.8 billion for LDCs +\$0.4 billion for IESO central services ¹⁰
Funding to LDCs	LDCs provided with separate Program Administration Budget and Participant Incentive funding. Participant Incentives were paid after LDC had paid the customer and invoiced the OPA ¹¹	LDCs have one budget for 6 years and can allocate funding between program portfolios as needed as long as LDCs remain cost-effective ¹²
CDM License Requirement	Performance Requirement: LDCs are required to “achieve reductions in electricity consumption and reductions in peak provincial demand through the delivery of CDM Programs...” ¹³	Activity Requirement: The LDC shall “make CDM programs available to customers in its licensed service area and shall, as far as is appropriate and reasonable having regard to the composition of the Distributor’s customer base, do so in relation to each customer segment in its service area” ¹⁴
Target allocation	LDC targets based on division of provincial target, according to LDC’s portion of provincial energy consumption and peak demand	Energy target based on achievable potential for each region and LDC territory ¹⁵
Program Composition	LDCs required to deliver SaveONenergy province-wide programs. While there were opportunities to get a local program approved by the OEB, the regulator’s “duplication test” and approvals process proved to be too onerous for any successful applications except one	LDCs can offer a mix of provincial, regional and local programs, including joint programs with gas companies. Programs are approved by the IESO and the “duplication test” rules have been amended to encourage collaboration and local/regional program applications
Incentives	Eligible for a performance incentive at 80% or over of each target. Also eligible for a cost-effectiveness incentive if LDC does not use full budget	LDCs are eligible for a Mid-Term Incentive (MTI), an Achieving Target Incentive (ATI) and an Exceeding Target Incentive (ETI), all of which increase if the

		LDC is part of a joint plan. Also eligible for a Cost-Efficiency Incentive. LDC can also opt for a pay-for-performance model. ¹⁶
Underperformance	LDCs that did not meet 80% of their energy savings targets were at risk of “disciplinary action”, although no formal action was eventually taken against LDCs who underperformed ¹⁷	IESO will track performance annually and take remedial steps of various degrees to help improve the LDC’s situation. If performance and cost-effectiveness falls below a certain threshold, the LDC will face financial remedies ¹⁸
Mid-Term Review	None	IESO has to complete a Mid-Term Review by June 1, 2018

Note: The definition of “cumulative savings” used for electricity conservation is different than that used for natural gas conservation in chapter 6.

Source: 2011-2014 CDM Master Agreement; 2015-2020 Energy Conservation Agreement, various Ministerial Directives between 2010 and 2014.

6.3 2015 Program Results

6.3.1 Understanding the Numbers: Legacy Programs vs. Conservation First Programs

2015 was a unique year for the province’s LDCs in terms of delivering CDM programs and achieving results. Given that there were CDM projects from the 2011-2014 CDM framework that were in the project pipeline but would not be completed by December 31, 2014, the Minister of Energy issued a Directive to the IESO in 2012 to extend the 2011-2014 framework for one year to December 31, 2015 and to provide the necessary funding for those projects to be completed.¹⁹ This allowed LDCs to engage customers for more long-term CDM projects as it assured customers of the continuity of programs and corresponding incentives past the original framework completion date of December 31, 2014.

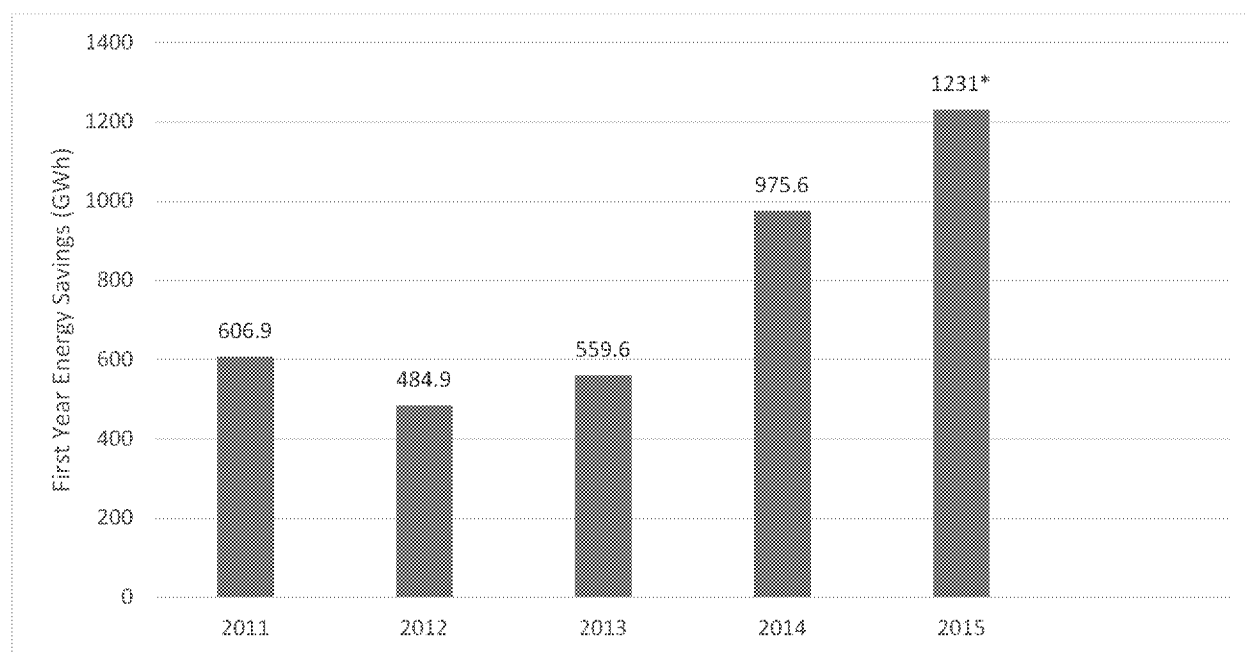
Under the new 2015-2020 Conservation First Framework, LDCs had until May 1 of 2015 to file their CDM plans to the IESO for review and approval. The framework also gave LDCs the option to launch the CFF framework on any date prior to January 1, 2016. From a customer point of view, the IESO indicated that participants hardly saw any differences in program availability or how the programs were delivered. Some programs such as the Fridge and Freezer Pick Up Program were discontinued in 2015, but that news had already been communicated to the market, independent of CFF. Given the strong results of 2015 (see Section 1.2.2 below), it can be deduced that customers did not experience any issues with different LDCs working on different timelines to transition to the new framework.

As a result of this “bridge” between framework, 2015 turned out to be a transition year for the province in terms of conservation frameworks as the 2011-2014 CDM Framework wrapped up, with two-thirds of LDCs deciding to launch the Conservation First Framework on January 1, 2016 and therefore delivering

only legacy programs from the 2011-2014 framework throughout 2015.²⁰ The budget for the 2015 legacy programs came from the 2011-2014 CDM framework's funds.²¹ The 2015 energy savings from the legacy programs, however, were attributed to the 2015-2020 Conservation First targets which undoubtedly will help LDCs with their target achievement by the end of the framework.

6.3.2 First Year of Conservation First Framework- How Did the Province do?

Net verified persistent energy savings from 2015 program activity was 1117 GWH, which represents 16% of the 7 TWH target under the Conservation First Framework. The results from 2015 are the strongest for the province to date, as can be seen from Figure 6.1 below. Results were 15% higher than in 2014 (the last year of the 2011-2014 results), which indicates that the transition between frameworks went smoothly. Another reason for the strong performance was that projects that were started in 2014 under the 2011-2014 framework but were completed in 2015 were counted towards the LDC's 2015-2020 CFF target, which undoubtedly bolstered the savings numbers. It will be important to track how LDCs perform in the next years of the framework when there are no carry-over projects from a previous framework to add to the savings numbers.



**Note: For an equivalent comparison with other years, the 2015 results are the incremental first year energy savings and not the energy savings that will persist into 2020*

Figure 6.1. First year Energy Savings from new conservation program activity for distribution-connected customers

Source: IESO

Almost 95% of the results (1048 out of 1117 GWH) were attributable to the 2011-2014 legacy programs as a majority of LDCs chose to start the new framework on January 1, 2016.²² For LDCs that did

transition to the CFF framework in 2015, the savings came from those initiatives that had been successful in terms of participation and savings in the last framework, such as the Coupon Program and the Retrofit Program. A more detailed breakdown of how the different suites of programs and individual programs performed is in Section 6.4 of the report.

6.3.3 The latest performance of the province

The final verified 2016 results were released by the IESO on June 30 2017. The ECO has not had the opportunity to analyze the assumptions behind this report and plans to do so in its next conservation report. The IESO reported that in 2016, LDCs achieved 1.2 GWh of incremental energy savings that will persist to 2020. When combined with 2015 results, the LDCs have achieved 2.6 TWh in the first two years of the 2015-2020 CFF, or approximately 38% of the province's 7 TWh target. The IESO has indicated that the LDCs continue to show progress towards achieving the CFF target by the end of the framework. Total CDM expenditure in 2016 was \$205 million. Together with the spending of 2015, LDCs have collectively spent 13% of their \$1.8 billion budget.²³

6.3.4 Defining the different types of conservation programs in the province

- Province-wide CFF Programs: CDM programs that have been developed by the IESO and the LDCs and available across the province currently under the Conservation First Framework (CFF).
- Legacy Programs: Province-wide programs that were part of the 2011-2014 CDM Framework and were delivered or completed in 2015 as LDCs transitioned between the two frameworks
- IESO-only CDM programs: CDM programs administered directly by the IESO for large transmission-connected customers, and demand response programs for distribution- and transmission-connected customers that are designed to deliver peak demand reduction, not energy savings. Results from IESO-only programs do not contribute to LDC targets.
- Regional/local CDM programs: CDM programs developed by one LDC (local) or a group of LDCs in one region (regional) that are approved by the IESO and delivered by those LDC(s) alongside the province-wide programs.
- Pilot Programs: Small-scale launch of a local/regional CDM program by an LDC to test the delivery mechanisms and savings realizations of an innovative initiative. These programs, approved by the IESO, are funded outside the CDM Plan funding to minimize budgetary risks for the LDC.
- Conservation Fund Programs: Innovative conservation technologies that have the potential to deliver significant energy savings have been funded by the IESO's Conservation Fund since 2005. Recipients of the Conservation Fund can be LDCs, technology companies, consultations, educational institutions etc. Unlike pilot programs, the goal of a Conservation Fund project is not always to test an initiative with the intent of transitioning it to a full-scale LDC program.

6.4 Individual Program Results by Sector²⁴

The 2015 results by initiative is presented in Table 6.2, along with the number of measures/projects completed for each initiative. For comparison purposes, the savings from the initiatives are divided between the 2011-2014 legacy programs delivered in 2015 and programs that are from the 2015-2020 Conservation First Framework. The table also presents the net energy savings from 2014, the last year of the CDM Framework, to track how programs have transitioned between frameworks.

Table 6.2. 2015 Conservation Results by Program for Distribution Connected Customers

Initiatives	Incremental Energy Savings (Net) (GWH)			Incremental Demand Reduction (MW)			Participation		
	2014	2015		2014	2015		2014	2015	
		From 2011-2014 Legacy Programs*	From Conservation First Framework programs		From 2011-2014 Legacy Programs*	From Conservation First Framework programs		From 2011-2014 Legacy Programs*	From Conservation First Framework programs
Residential									
Appliance Retirement	9.5	0	0	1.61	1.03		22563 appliances	14733 appliances	0
Bi-Annual Retailer Event	122.9	73.0	0		5		4824751 measures	3178024 measures	0
Coupon Program (Save On Energy Coupon Program)	32.8	49.8	31	2.4	3.3	2.02	1208108 measures	2075200 measures	1207533 measures
HVAC Incentives (Save on Energy Heating and Cooling Program)	42.9	45.97	10	23.1	24	5.3	113002 equipment	102154 equipment	20235 equipment
Residential New Construction	2.3	6.3		0.37	1.1		2367 homes	4012 homes	0
All Residential Initiatives	210.4	175.1	41	27.48	34.5				
Business									
Energy Audit (Save On Energy Audit Funding Program)		-	-	6.3	5.6	0	473 audits	356 audits	2 audits
Efficiency: ERII (Save on Energy Retrofit Program)	462.9	648.3	19	70.7	94	2.8	10925 projects	12547 projects	811 projects
Direct Install Lighting	84.5	32.3		23.4	11.9		23784 projects	18643 projects	0

EVERY JOULE COUNTS: ONTARIO ENERGY USE AND CONSERVATION YEAR IN REVIEW (DRAFT)

New Construction	20.4	21.8		6.4	5.2		226 buildings	168 buildings	0
Existing Building Commissioning	1.5	-		0.9	0.4		5 buildings	11 buildings	0
All Business Initiatives	569.3	702	19	107.79	117.1				
Industrial									
PSU- Project Incentive Initiative	72.1	122.7		9.7	13.6		10 projects	12 projects	
PSU- Energy Manager	40.4	25.18		5.2	7.6		379 projects	424 projects	
PSU- Monitoring and Targeting	0.5	-		0.1	-		5 projects	2 audits	
All Industrial Initiatives	113	148		15	21				
Other									
Low Income Program (Save on Energy Home Assistance Program)	19.58	11.75	0.975	2.5	2.2	0.21	25424 homes	15494 homes	1032 homes
Aboriginal Programs	3.1	3.24		0.8	0.6		1125 homes	1586 homes	
Program Enabled Savings		7.27			1.1			14 projects	
Sub-total for 2015 by Framework		1,047.67	61.51		176.6	10.4			
Total	915.38	1,117.5		153.57	187				

Figure 6.2 also illustrates the percentage contribution of each program portfolio to the energy savings achieved in 2015.

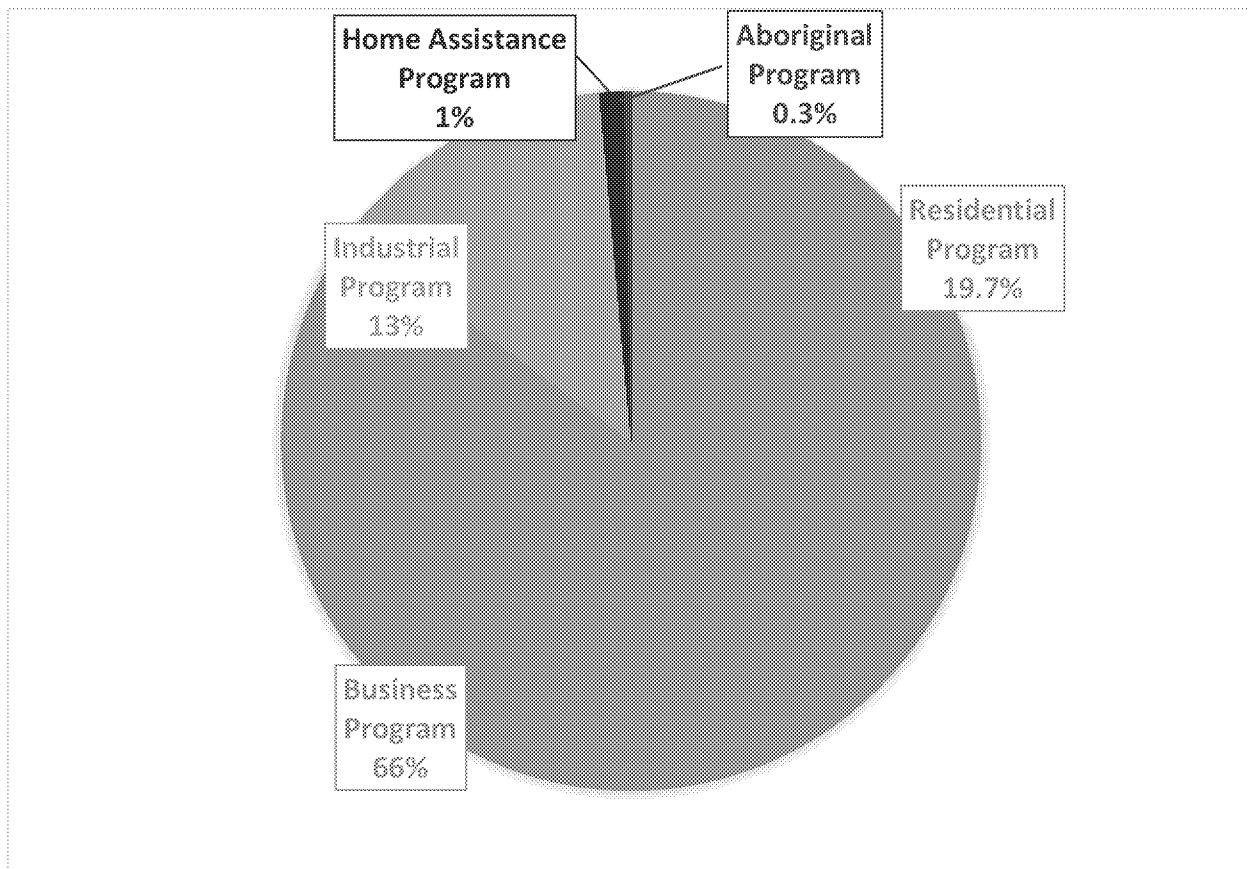


Figure 6.2. Percentage contributions of program portfolios to 2015 energy savings

Source: IESO

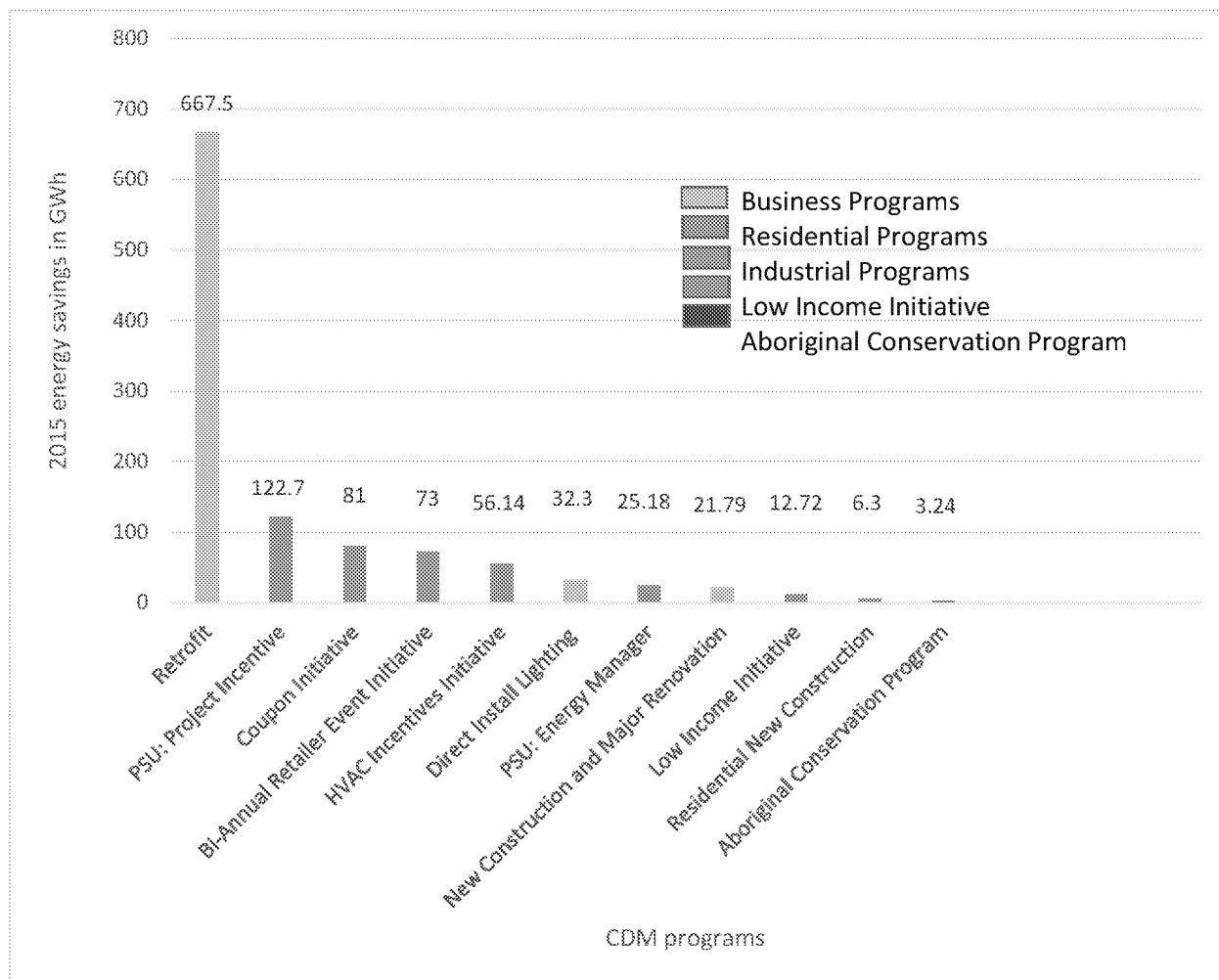


Figure 6.3 Persistent Energy Savings from leading conservation initiatives under the 2015-2020 Conservation Framework

Source: IESO

6.4.1 Residential Programs

The Residential Programs saw a strong year of program delivery in 2015, with the legacy programs delivering 80% of the savings for the year. The Coupon program resulted in the largest amount of savings (156 GWh) in the residential portfolio and was mainly due to the widespread redemption of LED coupons.²⁵ The HVAC program also saw a 10% increase in participation from 2014. Figure 6.3 indicates that the Coupon Initiative and the Retailer Initiative were the highest performers in the residential sector in 2015. Building on the success of the Coupon Program, the CDM Residential Working Group and the IESO have made several changes to the program, including offering higher incentives on certain lighting coupons and on clotheslines as well.²⁶ As of Fall 2017, the Coupon Program will be transformed into the Instant Discount Program and offered seasonally.

It is important to point out that there was no peaksaver PLUS program in 2015 since peak demand reductions are no longer the responsibility of the LDCs. The ECO had noted in its Let's Get Serious report (that reviewed the 2014 results) that the peakSaver Plus program had seen strong growth with over 300,000 installations across the province by the end of 2011-2014 framework.²⁷ The IESO has received Ministerial Direction to transition these devices, which are used to temporarily control air-conditioning fan cycles to reduce electricity use during high peak hours in the summer, to its capacity based demand response programs.²⁸ A detailed update on the peakSaver Plus program is available in text box 6.8.4.

6.4.2 Business Program

The business portfolio of the Save On Energy Programs remained the strongest performer of all the portfolios in terms of energy savings, as it has in previous years. It contributed close to 65% of the energy savings for the year. The Retrofit Program led the way in terms of energy savings, contributing close to 90% of the savings for the business sector and also increasing by 41% from 2014. Net energy savings for individual projects ranged from 2 kWh to over 6.2 GWh.²⁹ The IESO attributes the increase in energy savings to a higher number of projects (from 10,925 projects in 2014 to 13,358 projects in 2015) and to an increase in average project savings, which went up by 26% from 2014.³⁰ Figure 6.3 shows the savings contribution of the individual business programs, with the Retrofit Program leading the way. To further the continued success of the Retrofit Program, the Business Working Group and the IESO worked together to put make several changes to the program in 2016. The changes include a streamlined approvals process for projects under a certain incentive level; clarifying the eligibility for a custom track application; creation of a multi-site application model; and introducing more prescriptive measures to meet customer demand.³¹

On the other hand, the Direct Install Lighting Program (called the Small Business Lighting Program under the CFF) saw a 22% drop in the number of projects and a 40% drop in energy savings in 2015.³² The IESO attributes this decrease to the program reaching a saturation point in the small business sector with LEDs becoming standard installations, a concern that has been expressed by LDCs in the past years and recognized by the ECO's previous reports.³³ The average savings per project also decreased because only 60% of the energy savings will persist to 2020 due to baseline shifts.³⁴ The change in baseline is due to the upcoming changes in Canada's energy regulations and Canada's lighting market which will mean that a number of measures in the lighting initiative would have occurred anyway within the measure's expected useful life, even without the influence of the program. Therefore, the measure does not receive the full credit for achieving its energy and demand savings over the lifetime of the measure.³⁵

The Small Business Lighting Program was completely redesigned by the IESO and the Business Working Group in early 2016 and amended to encourage more participation for the rest of the framework. Those changes include on focusing on LED measure incentives, expanding the facility eligibility size from 50 kW to 100 kW of average demand and the maximum incentive that a customer can receive has also increased from \$1500 to \$2000.³⁶

6.4.3 Industrial Programs

The Industrial Programs also performed better in 2014 than in 2015, with both the Project Incentive Initiative and the Energy Manager Initiative under Process and Systems Upgrade experiencing an increase in savings from 2014, as shown in Table 6.2. However, these initiatives are multi-year initiatives and the increase in numbers could be attributed to the completion of projects that started earlier in the framework and not because of new customers signing up to participate in the initiatives. Of the 12 Project Incentive Initiatives completed in 2015, 4 of them were Behind-The-Meter Generation (BMG) projects that accounted for 73% of the program's savings.³⁷ Table 6.3 lists the BMG projects completed in 2015.

Table 6.3. BMG projects completed in 2015

LDC	Participant	Fuel Source	Contracted Savings MWh/Yr	EM&V Results MWh/Yr
Entegrus Powerlines (Chatham-Kent Hydro)	GreenField Ethanol Inc.	Natural Gas	25,630	28,291
Guelph Hydro Electric System Inc.	Magna	Natural Gas	50,760	42,148
Hydro One Networks Inc.	Erie Meats	Natural Gas	8,410	0
Hydro One Networks Inc.	Terra International Inc.	Natural Gas	22,355	16,649
Total			107,155	87,088

Source: IESO

There were also several BMG projects that were completed in 2015 but did not get included in the 2015 results because delays in measurement and reporting. Table 6.4 lists those BMG projects, the results of which will be counted in the 2016 EM&V process.

Table 6.4. BMG projects completed in 2015 but not included in 2015 savings results

LDC	Participant	Fuel Source	Contracted Savings MWh/Yr
Oshawa PUC Networks Inc.	Lakeridge Health	Natural Gas	12,880
Cambridge and North Dumfries Hydro Inc.	Toyota Motors Manufacturing Canada Inc.	Natural Gas	72,510
North Bay Hydro Distribution Limited	North Bay RHC	Natural Gas	12,900

Toronto Hydro	Campbells	Natural Gas	25,730
Hydro One Networks Inc.	Invista	Natural Gas	35,760
Thunder Bay Hydro	TBRHSC	Natural Gas	16,191
Hydro One Networks Inc.	3M Canada	Natural Gas	13,840
Total			189,811

Source: IESO

6.4.4. Is Combined Heat and Power a Form of Conservation?

Combined heat and power (CHP) or cogeneration refers to the concurrent production of electricity or mechanical power and useful thermal energy from a single source. In CHP, the heat that would normally be lost in the generation of electricity is recovered to provide useful heat or cooling, usually as hot water or steam.³⁸ Given that the water will cool down the longer it travels from the generation plant, CHP often works best if the thermal energy can be used by the same facility the CHP unit is located in, or the nearby community.

If the same energy source (e.g., natural gas) is being used to produce both heat and electricity, CHP is almost always more efficient than separately burning gas to generate electricity and to provide heat. From the grid operator's point of view, CHP behaves similarly to conservation, as the facility generates and consumes its own electricity, reducing pressure on the grid.

For these reasons, in the Conservation First Framework, CHP behind the meter generation (BMG) projects (under 10 MW) are considered to be part of the definition of CDM.³⁹ CHPs are currently eligible to receive funding and incentives under the Process and Systems Upgrade Initiative as part of the Industrial Programs. BMG CHP projects are integral to LDCs' CDM plans and their ability to meet targets (73% of electricity savings from the industrial programs in 2015 came from BMG projects, see Section 6.4.3 for more details).

There are other benefits to facilities and communities that install CHP units. CHP plants increase power reliability of facilities and/or can provide backup power during power failures. Several communities are now considering CHP as part of their community energy hubs. At least one CHP project in the northern part of the province that is currently in the pipeline is part of an energy hub, integrated with renewable generation such as solar panels and battery storage into a distributed energy network.

As most CHP units are fuelled by natural gas, the government's Climate Change Action Plan has raised uncertainty about the potential carbon policy treatment of CHP. LDCs have advised that many large customers are hesitant to undertake engineering studies to assess the feasibility of installing a CHP unit in their facility as there are concerns that CHPs may no longer be eligible to receive funding from the CFF

in the future. The Ministry of Energy' and the IESO's lack of any concrete direction in this matter has left customers and LDCs in limbo.

The actual impact of CHP in reducing or increasing greenhouse gas emissions in Ontario is ambiguous. Unlike most jurisdictions where CHP always displaces fossil-fuelled generation and reduces emissions, in Ontario, CHP may currently be displacing low-emission generation (nuclear or renewables) much of the time. This could change as the province moves away from relying on nuclear generation with the upcoming refurbishments, which could lead to an increased demand for more gas-fired generation. At that time, electricity generation from CHP could pose a lower emissions option for the province. More work is needed by the Ministry of Energy and the IESO to assess the impact of CHP on the province's overall emissions, both given Ontario's existing electricity supply, and its projected supply mix in the future.

6.4.5 Home Assistance Program and Aboriginal Program

The Save On Energy Home Assistance Program (the province's low income program) saw a 35% drop in participation. This may be attributed to the amendment in the CDM requirement in LDC licenses between the 2011-14 framework and the 2015-2020 Conservation First Framework. As mentioned earlier, the new CDM requirement mandates LDCs to deliver conservation programs in its territory "in relation to each customer segment in its service area".⁴⁰ This may mean that some LDCs did not include the Home Assistance Program in their CDM plans as one of the programs that they intended to deliver given the customer segmentation in its jurisdiction. However, results for the Home Assistance Program are expected to change in the coming years given the Minister's December 2016 Directive, which is discussed in Section 1.10.1 of this report.

The Aboriginal Program that was delivered by the IESO ended on December 31, 2015, but Hydro One is currently offering a First Nations Conservation Program that has already had over 3400 eligible homes participate in the program.⁴¹ Savings results from that program will be analyzed by the ECO in its next annual conservation report when it reviews the 2016 results.

6.5 Individual LDC performance

Table 6.5 outlines the performance of LDCs in the first year of the 2015-2020 CFF. As with the aggregate provincial results, savings from both legacy program activity and new CFF programs are included. In terms of their progress towards meeting their individual 2020 energy savings targets, the LDCs as a whole achieved 16% of their 7 TWH 2020 target. One medium-sized LDC has managed to achieve close to 70% of its 2020 target in the first year of the framework, and several others are close to the halfway mark of their targets. Several medium and small LDCs have only managed single digit progress on their targets.

According to the IESO, the LDCs that performed exceptionally well experienced far greater savings than they had projected due to a ramp up of activity prior to the end of the Legacy framework. Other factors that contributed to higher than expected savings were the strong uptake of the Coupon Program, and large Behind the Meter Generation (BMG) projects being completed in 2015 (See Section 1.3 on

program results).deciding not to update their CDM plans after the original submission on May 1, 2015,meaning that their planned CDM forecasts were not an accurate reflection of expected program activity.⁴² For LDCs that did not fare well in 2015, the IESO advised that it continues to monitor LDC performance on a monthly basis and has several remedial tools available in the Energy Conservation Agreement to help the LDC improve its performance.⁴³

Table 6.5. Individual LDC performance in 2015 under the 2015-2020 Conservation First Framework

#	LDC	Net Verified 2020 Annual Energy Savings (kWh)	Allocated 2015 - 2020 CFF LDC CDM Plan Target (kWh)	Progress Towards Allocated 2015 - 2020 CFF LDC CDM Plan Target (%) (17% = approximately on pace to meet target)
1	Algoma Power Inc.	1,031,011	7,510,000	14
2	Atikokan Hydro Inc.	109,769	1,140,000	10
3	Attawapiskat Power Corporation	35,822	510,000	7
4	Bluewater Power Distribution Corporation	7,755,327	62,370,000	12
5	Brant County Power Inc.	1,810,109	15,950,000	11
6	Brantford Power Inc.	7,457,011	54,320,000	14
7	Burlington Hydro Inc.	12,632,309	99,040,000	13
8	Cambridge and North Dumfries Hydro Inc.	15,435,132	85,000,000	18
9	Canadian Niagara Power Inc.	3,502,396	28,480,000	12
10	Centre Wellington Hydro Ltd.	1,581,029	8,730,000	18
11	Chapleau Public Utilities Corporation	275,333	1,050,000	26
12	COLLUS PowerStream Corp.	1,637,947	16,860,000	10
13	Cooperative Hydro Embrun Inc.	120,443	1,790,000	7
14	E.L.K. Energy Inc.	1,662,553	16,200,000	10
15	Enersource Hydro Mississauga Inc.	59,582,917	483,270,000	12
16	Entegrus Powerlines Inc.	38,558,192	56,830,000	68
17	EnWin Utilities Ltd.	14,809,440	151,300,000	10
18	Erie Thames Powerlines Corporation	5,180,177	27,630,000	19
19	Espanola Regional Hydro Distribution Corporation	502,006	2,410,000	21
20	Essex Powerlines Corporation	3,819,710	31,430,000	12
21	Festival Hydro Inc.	4,822,853	34,650,000	14
22	Fort Albany Power Corporation	29,906	340,000	9
23	Fort Frances Power Corporation	254,688	4,000,000	6
24	Greater Sudbury Hydro Inc.	6,959,582	34,740,000	20
25	Grimsby Power Incorporated	2,804,724	10,850,000	26
26	Guelph Hydro Electric Systems Inc.	58,594,547	99,040,000	59

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27	Haldimand County Hydro Inc.	8,342,090	19,850,000	42
28	Halton Hills Hydro Inc.	5,500,566	30,940,000	18
29	Hearst Power Distribution Company Limited	1,510,384	3,180,000	47
30	Horizon Utilities Corporation	70,835,688	330,680,000	21
31	Hydro 2000 Inc.	80,683	1,360,000	6
32	Hydro Hawkesbury Inc.	1,162,440	7,920,000	15
33	Hydro One Brampton Networks Inc.	29,578,103	255,160,000	12
34	Hydro One Networks Inc.	200,176,997	1,159,020,000	17
35	Hydro Ottawa Limited	57,247,836	394,540,000	15
36	InnPower Corporation	1,850,172	13,010,000	14
37	Kashechewan Power Corporation	40,200	520,000	8
38	Kenora Hydro Electric Corporation Ltd.	1,606,080	5,270,000	30
39	Kingston Hydro Corporation	4,445,966	34,500,000	13
40	Kitchener-Wilmot Hydro Inc.	21,865,242	105,710,000	21
41	Lakefront Utilities Inc.	2,239,136	12,170,000	18
42	Lakeland Power Distribution Ltd.	4,432,710	15,770,000	28
43	London Hydro Inc.	28,534,591	196,660,000	15
44	Midland Power Utility Corporation	2,860,953	10,830,000	26
45	Milton Hydro Distribution Inc.	9,889,501	45,360,000	22
46	Newmarket-Tay Power Distribution Ltd.	8,218,024	36,240,000	23
47	Niagara Peninsula Energy Inc.	12,742,252	74,440,000	17
48	Niagara-on-the-Lake Hydro Inc.	2,598,018	11,680,000	22
49	Norfolk Power Distribution Inc.	7,655,950	18,850,000	41
50	North Bay Hydro Distribution Limited	4,245,690	20,260,000	21
51	Northern Ontario Wires Inc.	509,731	4,310,000	12
52	Oakville Hydro Electricity Distribution Inc.	21,252,248	92,390,000	23
53	Orangeville Hydro Limited	3,398,117	14,150,000	24
54	Orillia Power Distribution Corporation	1,662,040	16,580,000	10
55	Oshawa PUC Networks Inc.	5,046,074	73,010,000	7
56	Ottawa River Power Corporation	2,779,858	8,720,000	32
57	Peterborough Distribution Incorporated	4,979,980	37,880,000	13
58	PowerStream Inc.	76,511,169	535,440,000	14
59	PUC Distribution Inc.	4,538,096	26,410,000	17
60	Renfrew Hydro Inc.	351,383	4,170,000	8
61	Rideau St. Lawrence Distribution Inc.	1,353,836	5,020,000	27
62	Sioux Lookout Hydro Inc.	537,110	3,700,000	15
63	St. Thomas Energy Inc.	2,146,544	17,510,000	12
64	Thunder Bay Hydro Electricity Distribution Inc.	5,286,985	48,420,000	11
65	Tillsonburg Hydro Inc.	1,886,420	11,310,000	17
66	Toronto Hydro-Electric System Limited	197,146,346	1,576,050,000	13
67	Veridian Connections Inc.	16,332,332	152,970,000	11
68	Wasaga Distribution Inc.	2,385,191	6,320,000	38
69	Waterloo North Hydro Inc.	12,799,897	82,380,000	16
70	Welland Hydro-Electric System Corp.	1,729,306	25,500,000	7
71	Wellington North Power Inc.	709,927	5,890,000	12
72	West Coast Huron Energy Inc.	438,855	8,080,000	5

73	Westario Power Inc.	4,282,957	23,010,000	19
74	Whitby Hydro Electric Corporation	6,210,809	58,440,000	11
75	Woodstock Hydro Services Inc.	4,312,063	22,970,000	19
Total		1,117,489,826	7,000,000,000	16

Source: IESO report to the OEB

6.6 Electricity Conservation Spending in 2015

Given that most of the energy savings for 2015 came from the 2011-2014 legacy programs, it is not surprising that the majority of the year's spending also came from the 2011-2014 budget. In total, the province spent \$432 million in the delivery of CDM programs, of which only \$25 million was from the CFF: \$22 million from the LDC CDM plan budgets and about \$3 million from the IESO's central budget. The rest of the spending for 2015 came from the 2011-2014 CDM framework budget.

Of the \$1.8 billion budgeted under the CFF CDM Plans over the 2015-2020 period, only 1.2% of that funding was used in 2015. The OEB notes that this has put the province's LDCs in an advantageous position of having a larger than anticipated budget available over the remainder of the term to use towards achieving their conservation targets.⁴⁴ The bulk of the spending in 2015 from the legacy program budget went to the Business and Consumer Programs, which is broken down in Figure 6.4.

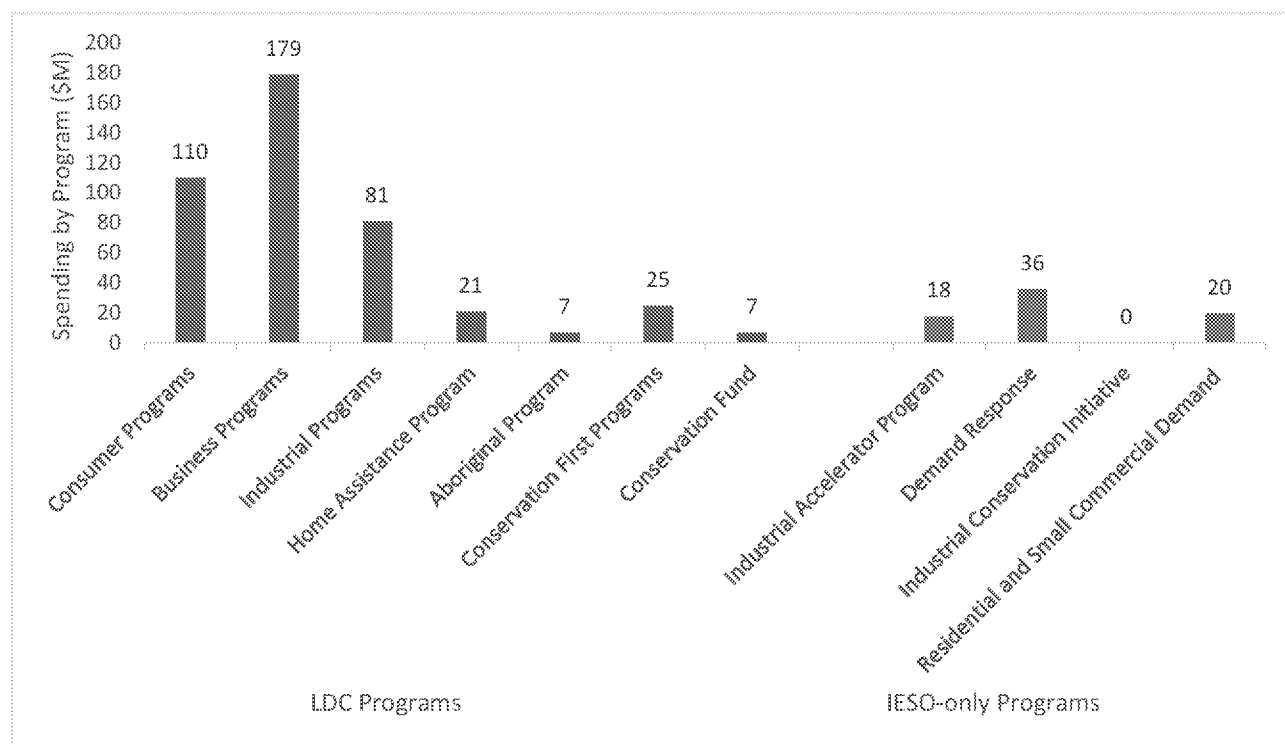


Figure 6.4. 2015 Conservation Spending by Program Portfolio

Note: Since Conservation First Framework expenditure only represented 5% of the total spending in 2015, spending from the framework's budget is shown as a program category in the chart (based on the information received from the IESO). The ECO will be providing more in-depth analysis of CFF spending in subsequent years.

Source: IESO

While the total conservation costs reported by the IESO was \$432 million, a total of \$429 million was recovered from Ontario's ratepayers through the Global Adjustment Mechanism (GAM). The reason for the variance of approximately \$3 million was because of budget reconciliations from the 2011-2014 CDM framework, changes in reporting methodology between frameworks, pre-funding provided to LDCs under the CFF and other items missed within the reporting timelines.⁴⁵ The \$429 million represents about 4.3% of the total GAM charged on electricity bills in 2015 and about 2% of the total electricity cost for the province.⁴⁶ These percentages are in line with previous years and conservation still amounts to a very small part of the electricity bill for Ontario's ratepayers.

Spending by type of expense is shown in Figure 6.5. As has been the trend in previous years, close to three-quarters of the expenses went towards customer incentives. The rest of the expenses went towards the IESO and the LDCs' respective administrative expenses. Under the CFF, the IESO remains responsible for the program evaluation, tracking of results, and province-wide marketing. The IESO's expenses will also include Central Services that are not program-specific and Value-Added Services towards specific initiatives, such as the administration of the coupon program. Either the IESO or the LDCs may be responsible for technical assistance, customer support, and other program delivery functions (this varies depending on the specific conservation program), and both groups have a role in program design.

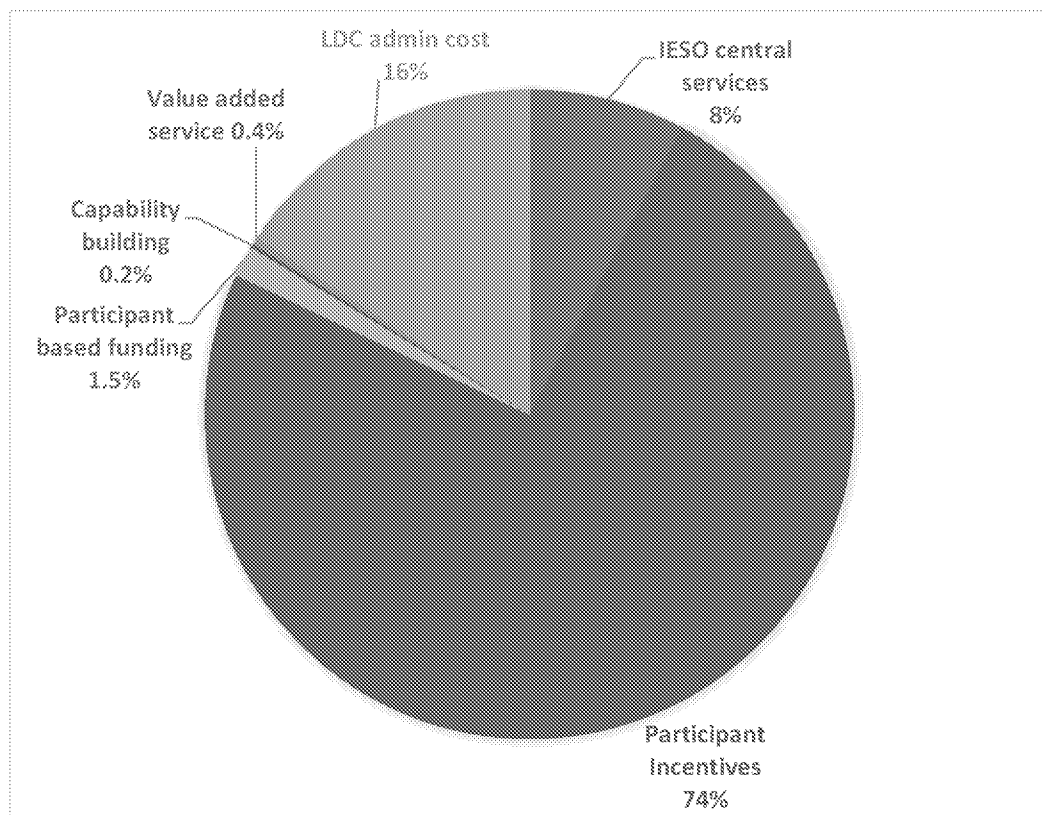


Figure 6.5. 2015 conservation spending by type of expense

Source: IESO

No local or regional LDC programs made it to market by December 31, 2015 and therefore the results and spending numbers above do not include energy savings from local programs or spending on those programs.⁴⁷ The IESO approved 5 local programs in 2015 but those were launched in 2016, so their spending and results can be expected from the IESO's 2016 results report later this year. More information on local programs and pilots under the CFF is in Section 1.8 of this report.

6.7 Cost-Effectiveness in 2015

The cost-effectiveness of programs in the first year of the CFF is shown in table 6.6. The cost-effectiveness of CDM programs during the entire 2011-2014 framework has also been added to compare the two frameworks. As has been done in previous years, two cost-effectiveness tests are used which compare lifetime costs and benefits, but from different perspectives. The Program Administrator Cost (PAC) reviews the costs and benefits from the view point of the program administrator while the Total Resource Cost (TRC) looks at the costs and benefits that accrue to all parties, such as the ratepayer and the participant.

A ratio of greater than 1 for both those tests generally indicates that the benefits outweigh the costs and therefore the conservation program has been beneficial for the province. In the CFF, the LDC's

whole portfolio of programs in each year of its CDM plan had to be greater than 1 for the IESO to approve the plan, with the caveat that if the proposed plan had a ratio of less than 1.3 then it would be subject to further review before approval.⁴⁸ Another change from the last framework is that the TRC now includes a 15% adder for non- energy benefits of conservation (including greenhouse gas emissions reductions) which will improve the benefit to cost ratios. This change was made under a Ministerial Directive issued in late 2014.⁴⁹ The modified test is known as the “TRC-plus” test and 2015 is the first year in which the adder is being used in cost-effectiveness reporting.

Table 6.6. Cost Effectiveness: 2015 Program Activity vs. 2011-2014 Program Activity

Program	Total Resource Cost Test Benefit: Cost Ratio		Program Administrator Cost Test Benefit:Cost Ratio		Levelized Cost of Delivery (c/kWh)	
	2015	2011-2014	2015	2011-2014	2015	2011-2014
Consumer	3.59	1.3	2.2	1.6	3.63	4.8
Business	1.05	1.3	2.28	2.8	2.9	3.1
Industrial	0.82	0.9	1.23	1.3	5.2	4
Home Assistance	1.01	0.6	0.88	0.6	8.9	11.4
Aboriginal	0.86	1.1	0.75	1.1	10.5	7.7
Total all Distribution-Connected Programs	1.29	1.2	1.99	2.2	3.5	3.6
IESO only Demand Response		1.6		1.1	Not applicable	
IESO only Industrial Accelerator	0.8	0.6	1.26	0.5	4.7	11.2
All Distribution- and Transmission-Connected Programs	1.27	1.2	1.96	2.1	3.54	3.7

Source: IESO, ECO Let's Get Serious Report

The cost-effectiveness numbers for the first year of the Conservation First Framework were positive for both the TRC and the PAC at 1.29 and 1.99 respectively. The corresponding numbers for the entire 2011-2014 CDM Framework were 1.2 and 2.2, which shows that the TRC has improved between the two frameworks while the PAC is seeing a slight drop. The TRC number has improved slightly given the Ministerial Directive in December 2014 to add a 15% adder to the TRC calculation to account for non-

energy environmental benefits, as mentioned earlier.⁵⁰ While the overall numbers have very small changes between the last framework and the first year of the new one, different program portfolios saw significant shifts. The residential programs, for example, went from a TRC and PAC of 1.3 and 1.6 to 3.59 and 2.2 respectively and the Coupon Program actually saw TRC numbers in the double digits at 11.21. The IESO indicated that the reason for such a high TRC is the fact that LED light bulbs, which contribute to a majority of the savings in the Coupon Program, have a much longer effective useful life than CFLs. The useful life of an LED is equal to that of 3-4 CFLs and therefore creates significant operational and maintenance savings along with sustained energy savings. The combination of a long useful life with declining equipment costs results in a high TRC.

Several Business Initiatives such as the Small Business Lighting and the Building Commissioning also scored low on both ratios but the overall program numbers were improved by the TRC and PAC numbers from the Retrofit and New Construction Initiatives. The IESO reported that the business programs saw lower cost-effectiveness numbers because of new avoided cost figures as well changes to the lighting measure baselines. The lower baseline measure has led to lower lifetime savings between the “conventional” lighting measure and the more “efficient” one. Given that incentive levels haven’t changed in 2015, the combination of lower lifetime savings and static incentives meant lower cost-effectiveness numbers for the business programs.⁵¹ The Industrial Programs portfolio was not cost-effective on the TRC but scored above 1 on the PAC. The numbers were similar to 2014. As the CFF programs ramp up, the TRC and PAC ratios can be expected to improve in the Industrial Programs if participation increases.

The other measurement that is used to understand the positive impact of conservation on the province is the levelized cost of delivering conservation. This compares the cost of delivering conservation to save a unit of power with the cost of generating the same unit of power. The levelized cost of conservation for 2015 is at 3.5 cents/ kwh, which is slightly lower than the 2011-2014 figure of 3.7, but still far more cost-effective than any other form of generation. As highlighted in Text Box 6.1.1., the cost of conservation is still less than conventional and renewable generation and therefore continues to be of good value to the province.

6.8 Results of IESO-only programs

In addition to the 2015-2020 Conservation First Framework, the IESO also delivers the Industrial Accelerator program directly to the province’s large transmission-connected customers, and also has responsibility for demand response programs. Since those programs are delivered directly by the IESO, they naturally don’t get counted towards LDC targets. These programs include the Industrial Accelerator Program (IAP), the Industrial Conservation Initiative (ICI) and the Capacity Based Demand Response Program. Table 6.7 details the performance of each of those IESO-only CDM programs in 2015.

Table 6.7. IESO-only CDM Program Performance in 2015

Program	Participation	Net 2020 Annual Energy Savings (MWh)	Net incremental Peak Demand Savings (MW)
Industrial Accelerator Program	16 projects	47,630	5.72
Industrial Conservation Initiative*	No. of participants not available	0	1,075
Capacity Based Demand Response	3 Aggregators	0	513
Residential and Small Commercial Demand Response**	290,053 Load Control Devices	290	172

Source: IESO

*Note: the Industrial Conservation Initiative is an initiative that allows participating customers to manage their global adjustment costs by reducing demand during peak periods

**Note: the current status on this program's future is detailed in text box 1.8.4.

6.8.1 Industrial Accelerator Program

The IAP provides financial incentives to large transmission-connected customers to invest in energy saving innovative processes and retrofits that will allow the facilities to save electricity and/or switch consumption from peak hours. The IAP now includes four different initiatives that companies can participate in, all of which are similar to initiatives delivered by LDCs to distribution-connected customers:

- Retrofit
- Process and Systems
- High Performance New Construction
- Energy Managers (recently introduced)

The IAP doubled the number of projects in 2015 to 16 projects compared to the 2014 participation.⁵² The increase in the number of projects also led to an increase in energy savings in 2015 to 49 GWh and peak demand savings of 5.7 MW. However, that number remains dismally short of the government's target of 300 MW (only 2%).

Results could grow if BMG projects in the pipeline proceed to completion. The IESO's initial forecast is that BMG projects under the IAP will lead to energy savings of 0.66 TWh, which includes 0.29 TWh of natural gas combined heat and power projects and 0.37 TWh from waste-energy recovery projects.⁵³

In the last 18 months, two major announcements have been made in an effort to increase participation in the IAP. The program has now been extended to December 31, 2020 to give customers the opportunity to participate in longer-term projects, matching the CFF timeframe.⁵⁴ Also, on December 16, 2016, the Minister issued a Directive that allowed transmission-connected customers with LDC-connected sites to participate in the IAP through the IESO. Any electricity savings accrued at the LDC level will be counted towards the LDC's CFF targets. The IESO will also undertake a pay-for-performance

pilot for customers who are eligible for the IAP similar to the centrally-delivered multi-distributor CDM program, discussed later in Text Box 1.10.3.⁵⁵

6.8.2 Capacity Based Demand Response (CBDR)

As mentioned earlier, the IESO is now responsible for demand response (DR) targets in the province and has already transitioned the Demand Response 2 and Demand Response 3 programs to the Capacity Based Demand Response (CBDR) Program in March 2015. The peaksaver PLUS program is also in the process of transitioning into an IESO administered market based structure. More information on the PeakSaver Plus Program is detailed in Text Box 6.8.3.

The IESO launched its first DR auction in December 2015, with a commitment period starting May 1 2016. A subsequent auction was held in December of 2016. The clearing price for the 2015 auction was 11% less than the historical contract cost from the DR 3 program, and the 2016 auction saw the clearing price drop to 24% less than historical prices. Since the auction has been introduced, participation has also increased from 6 to 21, which is a commendable effort from the IESO in garnering participation. The DR auction market has also allowed the IESO to conduct two pilots, one for large customers which explores capabilities to vary consumption throughout the day to meet changing demand conditions; and the other a residential pilot where the IESO worked with residential DR companies to understand residential load characteristics better.

As of December 2016, The IESO maintains 393 MW of DR response acquired through the auction, and 159 MW of DR response capacity that remains contracted through the CBDR, both of which it can dispatch during times of peak demand.⁵⁶ The IESO activated the CBDR once in 2016 which lasted for 4 hours. Its current capacity of 159 MW is set to expire in several pieces over the course of 2018-2019. The current CBDR program is considered a transitional program as it moves to incorporate these participants into its existing DR auction to compete against other providers of DR capacity and other types of resources such as generators and importers to meet Ontario's capacity.

Ontario is aiming to use DR (including price-based initiatives such as ICI) to meet 10% of peak demand by 2025, equivalent to approximately 2,400 MW under forecast conditions. Table 6.8 details the peak demand savings from DR activities in 2015. The 711 MW savings in 2015 represents 30% of the 2,400 MW forecasted peak demand savings in 2025 target. There were no CBDR activations in 2015 – peak demand savings are based on an evaluation of what level of demand reduction would be provided if called upon.

Table 6.8. Demand Response Savings in 2015

Demand Response Program in 2015	Net 2015 Annual Peak Demand Savings at the Generator Level (MW)
IESO Capacity Based Demand Response Program	526.2
LDC Delivered Residential and Small Commercial Demand Response Program	184.4
Total	710.6

Source: IESO

B-3 peaksaver PLUS: the latest

In the March 31, 2014 Directive from the Minister of Energy, the IESO was directed to transition all DR activities, including the peaksaver PLUS program, to an IESO-administered DR program. Until the transition was completed, the IESO's mandate was to continue to make the program available to LDCs and their interested customers. The IESO conducted a public stakeholder engagement process throughout 2016 to assess the future role and treatment of the program. After conducting a stakeholder engagement to consider the future role and treatment of the peaksaver PLUS program in January 2016, the IESO confirmed through a formal communication in March of that year that it will not be funding any new installations of the devices past the deadline of December 31, 2015 as per the Master CDM Program Agreement and section 3.3(a) of the Initiative Schedule (B-3). The communication, however, confirmed that the IESO will continue to maintain the program for existing devices and LDCs will continue to receive funding for maintenance of currently enrolled devices.

The IESO is currently working with the Conservation Residential Working Group to wind down the program by the end of 2017. Another IESO working group, the Demand Response Working Group, continues to work to transition residential DR to the IESO-administered market. No timelines have been provided for that transition.

The peaksaver PLUS Program had seen moderate success throughout the 2011-2014 CDM Framework, with over 300,000 installed devices by the end of the framework.⁵⁸ With the LDCs no longer responsible for DR targets and the IESO still undecided on the future of this initiative, the 300,000 devices are currently sitting idle in customers' homes and turning into stranded assets for the LDCs. In the ECO's view, the IESO should begin consultations shortly to include Residential DR into the CBDR market so that the work that has been done by the province, specifically the LDCs, to enroll Ontarians into this program does not go to waste.

6.9 Local/Regional Programs under the Conservation First Framework

Under the 2011-2014 CDM Framework, only one LDC, Powerstream (now Alectra) was able to receive approval from the OEB for a single local program. The Business Refrigeration Incentive Program, launched in late 2013, saw over a thousand businesses participate in the program. However, no other LDC applied for a local program to the OEB, citing the difficult approvals process established by the regulator. Both Hydro One and Toronto Hydro had applied separately for a suite of local CDM programs, but the OEB's rigorous hearing process led to Hydro One withdrawing its application and to Toronto Hydro not moving forward with the local CDM programs as the OEB did not approve sufficient funding.⁵⁹

The 2015-2020 Conservation First Framework put the responsibility of approving local and regional programs with the IESO, and LDCs can bring forward applications and business cases for local programs as part of their CDM plans or on an on-going basis. The IESO has developed guidelines for avoiding duplication with provincial programs, program innovation guidelines and an established timeline for program approvals.⁶⁰ Tables 6.9 and 6.10 list the local/regional programs and pilots that were approved by the IESO in 2015, 2016 and the first part of 2017.

Table 6.9. LDC Local Programs under the Conservation First Framework

Program Name	LDC(s)
Adaptive Thermostat Rebate Program	Toronto Hydro-Electric System Limited, Enbridge Gas Distribution
Business Refrigeration Incentive Program	PowerStream Inc, Enersource Hydro Mississauga Inc., Toronto Hydro-Electric System Limited; Hydro One Brampton Networks Inc.; Horizon Utilities Corporation
Instant Savings Program	Canadian Niagara Power Inc., Algoma Power Inc.; Bluewater Power Distribution Corporation
Social Benchmarking Program	Hydro One Networks Inc.; Horizon Utilities Corporation
Home Energy Report (HER) Program	PowerStream Inc.
First Nation Conservation Program	Hydro One Networks Inc.
Small Business Refrigeration Program	
Pumpsaver	Toronto Hydro-Electric System Limited; Oakville Hydro Electricity Distribution Inc.
Home Energy Savings Program	Hydro Ottawa Limited
Swimming Pool Efficiency Program	Toronto Hydro-Electric System Limited, Oakville Hydro Electricity Distribution Inc.; Hydro Ottawa Limited, Renfrew Hydro Inc.; Burlington Hydro, Milton Hydro Distribution, Halton Hills Hydro Inc.
High Efficiency Agricultural Pumping Program	Niagara Peninsula Energy Inc., Hydro One Networks Inc.

Home Assistance Program & Small Business Lighting Program	Five Nations Energy Inc.
Clothesline Instant Savings Program	Entegrus Powerlines Inc.; Essex Powerlines Corporation
Clotheslines Program	Westario Power Inc.
OPsaver	Toronto Hydro-Electric System Limited; Oakville Hydro Electricity Distribution Inc.
Residential Engagement Platform	Toronto Hydro-Electric System Limited
Smart RT for Small and Mid-Size Business	Toronto Hydro-Electric System Limited

Source: IESO

Table 6.10. LDC Pilots under the Conservation First Framework

Pilot Name	LDC(s)
Residential Direct Mail Pilot Program	Canadian Niagara Power Inc., Algoma Power Inc.
Home Energy Assessment & Retrofit Pilot Program	Customer First
Small & Medium Business Energy Management System Innovation Pilot	Kitchener-Wilmot Hydro Inc.; Energy+ Inc.
Truckload Events	Enersource Hydro Mississauga Inc.
Intelligent Air Technology	EnWin Utilities Ltd.
Residential Ductless Heat Pump/Financing	EnWin Utilities Ltd.
ECM Furnace Fan Residential Upstream Pilot	Horizon Utilities Corporation, Toronto Hydro-Electric System Limited, Kitchener-Wilmot Hydro Inc.
Solar Powered Attic Ventilation Research Oriented Pilot	Hydro One Brampton
Integration of Smart Thermostat with Dynamic Electricity Pricing and Customer Feedback	Hydro One Networks Inc.
Air Source Heat Pump - For Residential Water Heating	Hydro One Networks Inc.
Air Source Heat Pump - For Residential Space Heating	Hydro One Networks Inc.
Low-Income Air Source Heat Pump Pilot	Hydro One Networks Inc.
Hotel/Motel in suite A/C upgrades	Niagara Peninsula Energy Inc.
Advanced Roof Top Unit (RTU) Control Pilot	Toronto Hydro-Electric System Limited
Toronto Hydro - Enbridge Joint Low-Income Program Pilot	Toronto Hydro-Electric System Limited, Enbridge Gas Distribution

Electronics Take Back Pilot	Toronto Hydro-Electric System Limited
Data centre pilot	Toronto Hydro-Electric System Limited
P4P for Class B Office (Op saver)	Toronto Hydro-Electric System Limited
Hydronic Balancing (Pumpsaver)	Toronto Hydro-Electric System Limited
Residential Direct Install	Westario Power Inc.

Source: IESO

6.10 IESO Conservation Fund Programs

The IESO's Conservation Fund has an annual budget of \$9.5 million. Since 2005, this fund has supported over 200 innovative energy projects across Ontario. Funding is available for a three-year period proportional to the total investment needs of the project and is offered to LDCs, technology companies, consulting firms, universities and colleges, and the public sector. The fund considers initiatives that are developing or piloting innovative conservation programs and practices to bring about market transformation on a large-scale basis.⁶¹ Recipients of the Conservation Fund do not have to be LDCs. Table 6.11 lists the Conservation Fund Pilots that were delivered in 2015, listing their performance and funds allocated.

Table 6.11. Conservation Fund Pilots delivered in 2015

Program	Participation	Funding (\$)	Net 2020 Annual Energy Savings (MWh)	Peak Demand Savings (MW)	Program Administrator Cost (PAC)	Total Resource Cost (TRC)
EnerNOC Pilot	12 Projects	214,000	0	0	0.02	0.02
Loblaws P4P Pilot	18 Projects	561,333	8311	0.73	2.91	1.02
Strategic Energy Group Pilot	10 Projects	153,044	0	1.06	0.66	0.76
Social Benchmarking Pilot	150,258 Participants	1,007,425	0	1.65	n/a	n/a
Other Conservation Fund Pilots	Not Available	4,850,560	not available	not available		

In terms of cost-effectiveness, the EnerNOC and Strategic Energy Group pilots did not meet the cost-effectiveness threshold of 1. The IESO's evaluator indicated that the main reasons for the low figures is due to the fact that the programs are new and so participation was low and savings achieved were minimal.⁶² The Loblaws P4P Pilot, on the other hand, had strong results for both the PAC and the TRC,

with the PAC test even surpassing the province-wide Retrofit Program, which is the province's most successful program.⁶³ The model that was used for Loblaws is now being replicated in the IESO's P4P Large Customer Multi-Utility Program, so it will be interesting to see if the success of the pilot can be reproduced on a larger scale.

Table 6.12 lists the initiatives that have been approved by the IESO under the Conservation Fund in 2016.

Table 6.12. Conservation Fund Programs under the Conservation First Framework

Program	Proponent Company/ Organization	Funding Awarded
Enhancement of RETScreen Expert to further meet needs of Ontario Energy Professionals	CanmetENERGY	\$400,000
Intelligent MURB Energy Management Systems	SensorSuite	\$498,250
Pay-for-Performance Pilot	Ontario Clean Water Agency	\$1,000,000
Advantage Power Pricing Evolution	Powerstream	\$999,000
Residential Solar Storage Pilot	Powerstream	\$500,000
Hydraulic Air Compressor Demonstrator Project	Electrale Innovation Ltd	\$499,000
Bills that Save	BEworks Inc	\$450,000
Advancing Energy Efficient Water Services in Toronto	Toronto Water	\$100,000
Local Achievable Potential Study Allocation	Multiple LDCs	\$1,000,000
High Performance Buildings Program II	National Research Council Canada	\$2,000,000

6.11 2016 Policy Developments Affecting Electricity Conservation Programs

6.11.1 Minister of Energy's Direction on province-wide program availability

On December 16, 2016, the Minister of Energy issued a Directive to the IESO that included instructions regarding the availability and delivery of province-wide programs by LDCs to their customers. The Directive required LDCs that were not delivering all province-wide CDM programs to resubmit revised CDM plans by May 1 of 2017 outlining how they plan to deliver all approved programs in their service territories. Furthermore, if an LDC decided not to deliver a province-wide program, then the IESO would deliver the program in the LDC's jurisdiction and the associated electricity savings would not be counted towards the LDC's target. This directive moved away from the original direction that established the Conservation First Framework and gave LDCs the flexibility to deliver province-wide programs in their

service areas as they deemed appropriate and reasonable. It suggests that, in the Minister's view, this element of the Framework was unduly limiting customer access to some conservation programs, and required corrective action.

The IESO has informed the ECO that it received 32 revised CDM plans and notification from three others indicating which province-wide programs they plan to deliver. The other plans were exempted based on technical issues and merger activities. While most LDCs are planning to deliver all province-wide programs, some LDCs have revised their CDM plans to drop LDC delivery of some province-wide programs. The PSU- Monitoring and Targeting Program (Industrial), the Existing Building Commissioning Program (Business) and both the Business and Residential New Construction Programs (Business and Residential) were omitted from several revised CDM plans. The IESO is planning to deliver those programs in those service territories to fill in the program gaps by the end of 2017.

6.11.2 Minister's Direction on new province-wide programs

In June 2016, the Minister issued a Direction mandating the IESO to centrally design and deliver, in consultation with distributors, a province-wide pay-for-performance program for large multi-distributor consumers and a province-wide whole home pilot program for residential customers. Any electricity savings from these two programs will be counted towards LDC targets and the IESO, where appropriate, was directed to coordinate program delivery with the gas distributors. The IESO held multiple webinars and received written feedback as it developed the two programs throughout 2016 and into 2017. The two final programs are described below.

The Energy Performance Program for Multi-Distributor Customers

The program was launched in December 2016 and encourages whole building energy performance improvements for large customers who have several locations with multiple LDCs through incentives at a four cent per kilowatt-hour (kWh) of savings per year for up to four years. Participants are encouraged to make behavioural and operational changes along with capital investments to achieve and grow their energy savings over the course of the initiative. Eligible customers must have locations in two or more LDCs and have an annual consumption (single or aggregate) of at least 1,500,000 kWh, amongst other eligibility criteria.⁶⁴ To date, 1 single customer has enrolled 76 buildings across the province in the program.⁶⁵

The Whole Home Pilot for residential customers

The Whole Home Pilot program was launched in late May 2017 and is being delivered by Enbridge and Union Gas throughout the province. The pilot program is expected to integrate electricity efficiency measures into Enbridge and Union Gas' existing home retrofit offerings and offer a multi-fuel energy efficiency program. Customers will be offered incentives for retrofits/equipment upgrades through participation in home energy audits.⁶⁶ Electricity measures such as air conditioners and appliances, in

all participating homes, and additional measures including insulation and air sealing in electrically-heated homes, will be funded by the Conservation First framework. The program is expected to run until the end of 2017 and include approximately 22,000 households.

6.11.3 OEB's RPP Roadmap

As highlighted in the ECO's last energy conservation report, the OEB's roadmap to review the Regulated Price Plan (RPP) structure, announced in late 2015, is aligned with the ECO's observations regarding TOU pricing that TOU prices can be used to minimize long-term system costs.⁶⁷ In July of 2016, the OEB issued its RPP Roadmap: Guidelines for Pilot Projects on RPP Pricing and invited LDCs to apply to the OEB to develop and implement price and non-price pilots. The pilots are expected to help the OEB assess various RPP options (e.g. alternative electricity rate structures) that may eventually be made available province-wide to RPP-eligible customers. To date, the OEB has received 5 RPP pilot applications (1 is from a group of 7 LDCs represented by a consultant), and has approved 2.⁶⁸

The IESO has also received direction from the Minister of Energy in December 2016 to fund these RPP pilots through its Conservation Fund and to establish a streamlined approvals process to access funding. Apart from funding, the IESO will have no further role in these RPP pilots.

6.11.4 Mid-Term Review of the Conservation First Framework

As per the Minister's 2014 Directive that established the 2015-2020 Conservation First Framework and the 2015-2020 Energy Conservation Agreement, the IESO is required to complete a Mid-Term Review of the Framework by June 1, 2018. The IESO has established an advisory group of LDCs, vendors and customers that is expected to review various critical aspects of the framework including targets and budgets; lessons learned on LDC funding models; customer needs; program effectiveness (including LDC and IESO services); conservation integration with regional planning; CFF alignment with Climate Change Action Plan (CCAP) initiatives; post-2020 approaches to energy efficiency; and the definition of conservation. The IESO will also be undertaking a broader stakeholder engagement process which will include LDCs, customer groups and various other interested agencies and associations in late 2017.

6.11.5 The IESO's Achievable Potential Study

One of the key inputs into the Mid-Term Review process is the IESO's Achievable Potential Study (APS) that was completed in late 2016. The IESO was required to complete the first study by June 30, 2016 as per a Ministerial Directive. The purpose of the study is to provide a short-term electricity conservation potential that is achievable in the CFF, which would feed into the Mid-Term Review process; and also to conduct a more long-term conservation analysis over a 20-year horizon (2015-2035). The released APS includes an energy efficiency study and a BMG study. This APS is expected to be different from the last one completed in early 2014 since it incorporated LDC-specific information into its analysis and

produced results at an LDC level as well, i.e., the study used a bottom-up approach to assess both the short and long-term conservation potential of the province. The IESO's consultant undertook an extensive data request and survey with the province's LDCs and also reviewed OEB data to develop this study.

With respect to Ontario's short-term conservation goals, the study concluded that the achievable potential electricity savings (with both energy efficiency and BMG projects) under the 2015-2020 CFF is approximately 7.4 TWh based on the existing funding. The study also concluded that the LDCs collectively can meet and exceed the 7 TWh target that has been set by the province. The long-term study estimated that if incentive levels remain similar, the province has the potential to achieve 18 TWh of energy savings by 2035. If spending constraints and incentive caps are removed, that potential could rise to 29 TWh.

Along with influencing the Mid-Term review results, the APS will also have an impact on the LDCs' Mid-Term Incentive (MTI) payments halfway through the framework, as the MTI is based on LDCs achieving the lesser of 50% of their CFF target or 50% of their APS target.⁶⁹

Endnotes

¹ March 31 Directive to IESO

² ECO information request/ IESO website

³ ECO 2015 report

⁴ ECO 2015 report page 170

⁵ OEB directive 2014

⁶ IESO 2015 results report

⁷ IESO report to OEB on 2015 results

⁸ OEB RPP Price Report 2016

⁹ IESO email exchange

¹⁰ Ministerial 2014 Directive on CFF

¹¹ IESO-LDC Master Agreement

¹² IESO presentation on budget target allocation

¹³ OEB Directive 2010

¹⁴ OEB directive 2014

¹⁵ IESO budgets and targets presentation

¹⁶ ECA Section 4.5

¹⁷ OEB 2015 report

¹⁸ ECA Section 5.4

¹⁹ IESO 2012 directive

²⁰ https://www.oeb.ca/oeb/_Documents/CDM/IESO_2015_LDC_CDM_Program_Results_Report.pdf

²¹ IESO 2015 program results

²² IESO 2015 report

²³ <http://www.ieso.ca/sector-participants/conservation-delivery-and-tools/conservation-targets-and-results>

²⁴ https://www.oeb.ca/oeb/_Documents/CDM/IESO_2015_LDC_CDM_Program_Results_Report.pdf

- ²⁵ IESO report page 2
- ²⁶ IESO information request Question 17
- ²⁷ ECO lets get serious page 176
- ²⁸ Ministerial CFF Direction 2014
- ²⁹ IESO Business Evaluation Report, page 12
- ³⁰ IESO report page 2; IESO 2015 Business Evaluation Report Page 12
- ³¹ IESO information request Question 17
- ³² IESO report page 2; IESO business evaluation report page 12
- ³³ ECO 2013 report page 103
- ³⁴ IESO report page 2
- ³⁵ IESO Business Evaluation Report page 47-48
- ³⁶ IESO information request Question 17
- ³⁷ IESO 2015 report
- ³⁸ <https://energy.gov/eere/amo/combined-heat-and-power-basics>
- ³⁹ Minister's March 2014 direction
- ⁴⁰ OEB directive
- ⁴¹ <http://www.hydroone.com/MyHome/SaveEnergy/Pages/FNCP.aspx>
- ⁴² IESO information request, question 5
- ⁴³ Ibid
- ⁴⁴ OEB CDM results report
- ⁴⁵ IESO information request Question 1
- ⁴⁶ The GAM charged to Ontario's customers in 2015 totaled \$9963 million: <http://www.ieso.ca/sector-participants/settlements/global-adjustment-components-and-costs>; the total cost of electricity service in current dollars is \$20 billion, page 2 of the Ontario Power Outlook.
- ⁴⁷ IESO information request, question 4
- ⁴⁸ IESO CDM Plan Submission and Review Criteria Rules
- ⁴⁹ Ministerial Directive on 15% adder
- ⁵⁰ Ibid
- ⁵¹ IESO response to Q#38
- ⁵² IESO reported 8 projects in 2014 (ECO 2015 report, page 184) and 16 projects for 2015.
- ⁵³ ECO information request Q 25
- ⁵⁴ <http://www.ieso.ca/sector-participants/energy-efficiency-for-large-consumers/industrial-accelerator-program>
- ⁵⁵ Ministerial Directive Dec 16 2016
- ⁵⁶ <http://www.ieso.ca/Sector%20Participants/Market%20Operations/Markets%20and%20Related%20Programs/Capacity-Based%20Demand%20Response>
- ⁵⁷ ECO information request Question 32
- ⁵⁸ ECO 2015 report page 176
- ⁵⁹ Hydro One CDM application, Toronto Hydro CDM application
- ⁶⁰ <http://www.ieso.ca/sector-participants/conservation-delivery-and-tools/ldc-toolkit>
- ⁶¹ IESO Conservation Fund Application Guidelines
- ⁶² IESO EnerNOC and SEG Pilot 2015 Evaluation, page 7s
- ⁶³ IESO Loblaws Pilot 2015 Evaluation, page 6
- ⁶⁴ <https://www.saveonenergy.ca/Business/Program-Overviews/Energy-Performance-Program>
- ⁶⁵ IESO information request Question 14
- ⁶⁶ <https://saveonenergy.ca/Consumer/Programs/energy-efficiency-for-the-whole-home.aspx>
- ⁶⁷ ECO lets get serious page 197
- ⁶⁸ <https://www.oeb.ca/industry/policy-initiatives-and-consultations/rpp-roadmap>
- ⁶⁹ ECA Section xxx