

Ontario Energy Board

**Third Tranche Conservation and Demand Management Spending
Staff Report**

December 15, 2009

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1. EXECUTIVE SUMMARY

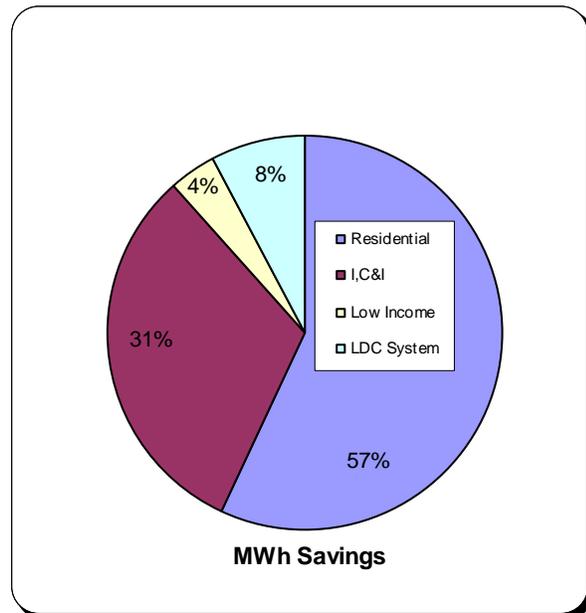
This Report summarizes the results from the third tranche Conservation and Demand Management (“CDM”) spending period.

In 2004, the Minister of Energy granted approval for all electricity distributors in Ontario to apply for an increase in their 2005 rates contingent upon their investment of an equivalent amount in CDM. In total, \$163 million dollars was approved by the Board to be spent on conservation initiatives by 85 different distributors.

Over the course of the three year third tranche period (2005-2007), distributors undertook various CDM programs in all facets of conservation. This time period acted as the first substantial venture into the field of conservation for both the distributors and the Board itself. As this was a considerable learning period, the Board provided opportunities for distributors to fully exhaust their approved CDM budgets and continue to deliver conservation programs to their customers. By way of Board-approved extensions, some distributors continued programs into 2008. All approved third tranche CDM budgets were to be exhausted by December 31, 2008.

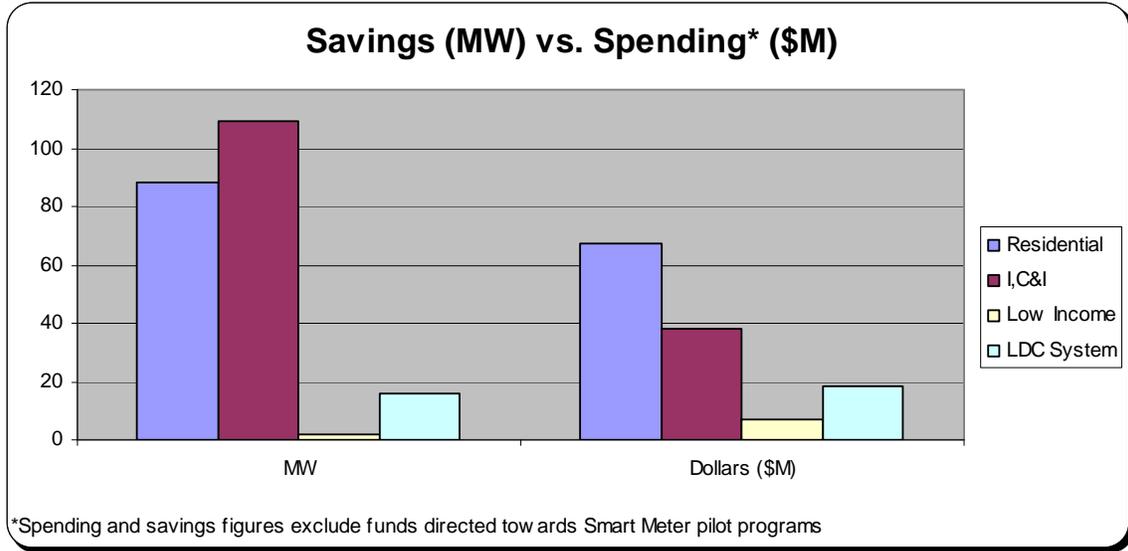
This Report has been structured to provide a summary of the results from the third tranche CDM period that have been reported by distributors. The Report outlines the areas of interest throughout distributors’ third tranche CDM portfolios and may be useful as a reference tool to be used in conjunction with distributors’ detailed annual reports, which have been filed with the Board.

Distributors offered CDM programs to the residential, municipal, industrial, commercial, institutional and low-income sectors. Within these sectors, a wide range of CDM programs were offered by distributors to help engage their customers and develop a culture of conservation across the province of Ontario.



In total, it was reported that approximately 1.358M MWh were saved by the conservation efforts which distributors undertook. Approximately 57% of the total MWh savings came from the residential sector, while the industrial, commercial

and institutional sectors combined to provide approximately 31% of the savings. CDM initiatives targeted at the distributor's system accounted for 8% of the MWh savings, while low-income sector programs resulted in approximately 4% of the savings total. In regards to avoided peak demand, approximately 220 MW were reported to be saved over the course of the third tranche CDM period.



The information and results described in this Report are as reported by distributors and have not been independently verified or audited by the Board.

2. PURPOSE

The purpose of this Report on third tranche Conservation and Demand Management Spending (the "Report") is to provide a summary of the results of electricity conservation and demand management ("CDM") programs funded through distribution rates, by way of the third instalment of distributors' incremental market adjusted revenue requirement ("MARR").

Approval of the CDM funding was conditional on distributors filing with the Board annual and quarterly¹ reports on the progress of the initiatives within their CDM plans. The annual reports, which were to include a cost benefit analysis, were due by March 31st of each year.

This Report is an overarching summary document that is meant to highlight the matters that have been reported to the Board by distributors in respect of the early years of electricity CDM in Ontario. The Report, in conjunction with the distributors' annual filings, can be used as a reference tool by interested parties when developing future CDM plans and reviewing past experiences in the field of conservation.

3. BACKGROUND

Under the legislative framework established by the *Energy Competition Act, 1998*, municipalities were required to establish business corporations through which to distribute electricity. The Board subsequently determined that these new corporate entities were entitled to earn a selected market-based rate of return ("MBRR") between 0 and 9.88%. A calculation was performed to determine the incremental revenue requirement by the distributor to generate its MBRR. This incremental revenue requirement is called the market adjusted revenue requirement ("MARR"). The incremental MARR was to be recovered by distributors through rate increases in three instalments called "tranches". The first tranche and second tranche were recovered in 2001 and 2002 rates, respectively. In 2002 a rate freeze was put in place by the government and the third instalment of incremental MARR was not recovered in 2003 as planned.

On May 31, 2004, the Minister of Energy granted approval to all electricity distributors in Ontario to apply to the Board for an increase in their 2005 rates by way of the third instalment of their incremental MARR. The Minister's approval was conditional upon a commitment to invest an equivalent of that amount in CDM.

¹ By Vary Order dated July 6, 2007, the Board varied earlier orders that required distributors to make quarterly reports. As a result, only annual reporting has been required as a matter of course since that time.

On December 10, 2004, the Board issued its Decision² approving applications from six of the province's largest distributors, known as the Coalition of Large Distributors ("CLD"), for their third tranche of MARR CDM initiatives. The Board reviewed 10 key issues raised by intervenors or applicants, which included cost-benefits analysis, LDCs' rate base, MARR, incremental expenses, operating versus capital expenses, program modifications, smart meters, program balance, low-income consumers and LED traffic lights. The Board decision also required the applicants to implement reporting and monitoring mechanisms.

Within the application, the CLD included their requested CDM budgets. Toronto Hydro-Electric System Limited ("Toronto Hydro") applied for the largest budget totalling \$39.5 million. Combined with Toronto Hydro's request, Hydro Ottawa Limited (\$9.3M), Enersource Hydro Mississauga Inc. (\$8.2M), PowerStream Inc. (\$6.4M), Horizon Utilities Corp. (Hamilton) (\$5.2M) and Veridian Connections Inc.'s (\$3.5) total budgets made up \$72.1 million, or approximately 44% of the approved expenditures for the third tranche CDM period.

In 2005, the majority of all other distributors in the province brought forward, and the Board approved³ CDM plans, that combined with the CLD approvals totalled \$163 million in CDM funding for distributors, an amount related to the third tranche of their MARR.

Third tranche funding was scheduled to be spent by September 30, 2007. However, several distributors received approval from the Board to extend delivery of their programs beyond this date, as funding was not yet exhausted.

By letter dated May 12, 2006, the Board indicated that selective audits of the annual reports would be conducted, to determine whether distributors' CDM activities were in accordance with their respective CDM plans, and whether CDM annual reports conformed to the Board's regulatory requirements. The results of this review were summarized in the Board's Chief Regulatory Auditor's report, "Review of 2005 Conservation and Demand Management Annual Reports", issued May 17, 2007.

On February 2, 2009, the Board issued a letter which provided the 2008 reporting requirements and filing deadlines for annual reports in relation to third tranche and incremental CDM funding. This Report summarizes those distributor filings insofar as they relate to third tranche spending⁴.

² December 10, 2004, RP-2004-0203, Volume 3.

³ In the various Decisions issued by the Board within the ambit of proceeding RP-2004-0203.

⁴ For distributors who did not file according to the Board's direction on February 2, 2009, the most current information on file with the Board has been used in this Report.

4. COALITION OF LARGE DISTRIBUTORS

The CLD serves approximately 40% of Ontario's electricity market and represents approximately 1.7 million customers. Within the 2008 annual reports, the CLD reported that it had spent all but \$50,000 (or less than 0.1%) of its approved third tranche CDM funds. The CLD issued a CDM Retrospective Report⁵ after finalizing various savings and spending figures following the 2007 program year. Within its report the group stated that it was able to achieve 527 million kilowatt-hours of electricity saved – enough to power 58,546 homes for one year.

The table below illustrates the results the CLD group reported to have achieved through its conservation initiatives from 2005-2007:

Utility	Dollars Spent (\$M)	kWh saved (M)	Tonnes of CO₂ emissions diverted
Toronto Hydro	\$40.0	270.7	64,149
Enersource	\$8.4	60.1	14,237
Hydro Ottawa	\$8.0	75.2	17,821
Horizon (Hamilton)	\$7.1	40.8	9,665
PowerStream	\$6.6	62.2	14,732
Veridian	\$2.8	18.0	4,274

*All information in the table is taken directly from the CLD CDM Retrospective Report 2005-2007.

5. TYPES OF PROGRAMS

As part of their third tranche CDM plans, distributors delivered a variety of programs targeted to residential, commercial and industrial customers. Many distributors also delivered programs specifically targeted to low income⁶ consumers and/or consumers living in social housing.

In the May 31, 2004 letter to electricity distributors, the Minister of Energy indicated the types of programs that he believed should be supported by the Board as eligible for third tranche funding. These measures included:

- energy efficiency;
- behavioural and operational changes, including the application of benchmarking or “smart” control systems;

⁵ Coalition of Large Distributors, CDM Retrospective Report 2005-2007.

⁶ With respect to third tranche programs, distributors had the discretion to define which customers were considered to be “low income” for the purposes of the targeted programs.

- load management measures which facilitate interruptible and dispatchable loads, dual fuel applications, thermal storage, and demand response;
- measures to encourage fuel switching which reduces the total system energy for a given end-use;
- programs and initiatives targeted to low income and other hard to reach consumers; and
- distributed energy options behind a customer's meter such as tri-generation, cogeneration, ground source heat pumps, solar, wind, and biomass systems.

6. RESIDENTIAL AND MUNICIPAL PROGRAM SUMMARY

Dollars Spent (\$M)	MWh Saved	MW Saved
\$67.3	663,159	89

Within the residential and municipal sectors, common programs delivered by distributors included:

- Municipal street and traffic light LED conversions;
- Electrical appliance rebate/exchange;
- Consumer training and education;
- Dedicated CDM website;
- Water heater load control;
- Compact fluorescent light bulb (“CFL”) giveaways and exchanges;
- Home energy audits;
- Seasonal LED light exchange;
- Conservation kits for customers; and
- Customer price alert/demand response.

One of the common programs that distributors provided was some form of consumer education. Within their 2008 annual reports, distributors noted that although savings were not necessarily quantifiable through traditional standards such as the Total Resource Cost (“TRC”) test, it was imperative for future conservation success that the philosophy of conservation was passed along to the consumer. Distributors reported that direct contact with customers by their staff was very helpful in understanding the gaps within the CDM offerings.

Some distributors developed separate business offices to channel various green products and found it to be a very successful endeavour. Distributors reported that having a separate channel to interact with consumers has provided the avenue for collaboration and a direct link for consumers to engage with their electricity provider. This direct link provided the ability for consumers to enhance

their knowledge about green product offerings and to receive valuable information on conservation efforts in their area and the province as a whole.

A related program which many distributors found very helpful in the task of educating their customers was developing a conservation website. Distributors reported that they found the establishment of a dedicated CDM website to be a very good opportunity to educate, inform, market and promote available programs to their consumers uniformly. Relaying a succinct and consistent message surrounding a distributor's efforts and goals, in regards to conservation, was found to be vital. It was found that a CDM website provided lower administration costs compared to other educational programs and provided the ability to reach a large customer base. Distributors noted that educational programs are necessary in developing a culture of conservation and they wholly support the continuation of such programs.

Stemming from the efforts to better educate consumers on their energy use and in an attempt to help them efficiently adjust their usage patterns, distributors frequently took part in various forms of energy audits. A home energy audit shows how the home is using energy and where it is being leaked. Improvements to the home's heating, cooling, hot water heating and other energy uses that could result in substantial energy savings are identified and relayed to the home owner for possible implementation. Energy audits were made available either through the distributors' conservation websites or through specific program offerings. The success of energy audits in the residential sector was very promising and useful for consumers of all sizes. The continuation of energy audits in conjunction with proper educational elements was reported as a necessary step moving forward.

It was reported by distributors that there was a significant interest from residential customers in the appliance rebate/exchange program. Distributors noted that customers were interested in enrolling in future programs of this nature. The Ontario Power Authority adopted a similar province-wide program, "The Great Refrigerator Roundup", which it has included in its suite of residential program offerings.

Other residential and municipal programs offered by various distributors over the course of the third tranche CDM period varied from seasonal LED light exchanges to black out day campaigns to demand response programs.

Most distributors agreed that the continuation of various lighting programs (e.g. municipal street lighting, CFL giveaways, seasonal LED programs, etc.) is necessary, but that limits to their effectiveness are apparent as these programs have been offered to the majority of customers and the potential for more energy savings is limited until newer, more efficient technologies emerge.

Greater savings may be achieved through the advancement of demand response programs, however, some distributors reported that it is mandatory to meet with participants prior to them enrolling in the program. This meeting should be intended to enable the distributors to obtain a better understanding of the customer's normal response to demand events and allow for the distributor to properly assess the most effective way to engage the customer. In relation to this, it was often noted that informing participants of upcoming demand response periods must be easy and ubiquitous. If done properly, distributors feel that significant peak and energy savings are available at a relatively low cost, however, cautioned that future distributors looking to engage in demand response programs should expect that a considerable amount of effort will be required during the implementation stage.

Some distributors reported that when making program decisions for the residential and municipal sectors, partnering with adjacent distributors often aids in both lowering expenditures and providing insight into new developments. As such, these distributors noted that working in conjunction with other distributors will be pivotal going forward. The ability to learn from the experiences of other distributors, as well as lowering program costs and utilizing economies of scale, was found to be advantageous.

7. INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL PROGRAM SUMMARY

Dollars Spent (\$M)	MWh Saved	MW Saved
\$38.2	363,723	110

Distributors commonly focused their efforts within the industrial, institutional and commercial sector on the following programs:

- Building retrofits;
- Building demand response;
- Mid-large customers – interval metering;
- Energy audits; and
- Business incentive programs.

Other programs in which a small number of distributors engaged were: occupancy sensor installation, on-bill payment plan, farm efficiency, power factor awareness and load management.

Distributors found that major energy savings were associated with efforts directed towards building retrofits. In particular, upgrading lighting and building weatherization provided a very good return on investments. It was noted by most distributors that uptake at the beginning of retrofit programs was slow in nature,

which was attributed to customers' unfamiliarity with conservation programs. After some efforts to help the customers better understand the importance and financial savings involved with changing their habits, uptake was notably better. With respect to building retrofits, an example of a program that was largely successful was the Electricity Retrofit Incentive Program ("ERIP"). ERIP was offered by distributors to help assist commercial, industrial, institutional and agricultural customers retrofit an existing facility with new, more efficient and effective equipment. The ERIP program focused on the areas of lighting, motors, heating ventilation and air conditioning and overall electricity systems to target the most important electricity upgrades businesses will engage in.

Distributors who incorporated an interval metering program within their conservation program mix reported encouraging results. Interval metering installations normally took place within mid to large customer facilities and most distributors reported that many customers responded well to the fact that they were able to visualize their energy use over different periods. There was a recommendation that the addition of an expert consultant amplifies the results for most participants as the consultant is able to suggest the next steps the customer can take in order to efficiently use electricity within its operations. At a minimum, many distributors noted that it is essential to provide customers access to their usage information in an easy to translate form.

Commercial, industrial and institutional load control programs (the installation of load control equipment within industrial and commercial facilities) offered very high success rates, and upon the completion of the program, returned positive TRC results for those distributors who offered such programs. Distributors supported further development of programs of this nature.

With early uptake figures being somewhat low for most of the programs targeted to large-users, distributors found that by offering some sort of monetary incentive, consumers were more willing to enroll in a program. Some of these incentives were in relation to the amount of kW saved by an individual user. Tying a tangible financial return to the conservation efforts increased uptake by large-use customers.

8. LOW-INCOME PROGRAM SUMMARY

Dollars Spent (\$M)	MWh Saved	MW Saved
\$7.0 ⁷	43,645	2.3

⁷ In total, 27 distributors offered programs directed specifically to low-income consumers.

For low-income participants, distributors offered the following group of programs:

- Energy audits – social housing units;
- Low-income consumer retrofits;
- Social Housing Refrigerator program; and
- First Nations consumer retrofits.

The main programs targeted to the low-income and social housing community involved energy audits and housing/building retrofits. Most distributors reported that the greatest opportunity to find the majority of savings from the low-income sector was to target social housing units. Particularly, distributors reported that the most effective use of their resources within the sector was to direct conservation efforts towards lighting upgrades, weatherization methods (i.e. stripping, caulking, etc.), door upgrades, replacing or exchanging appliances with energy star certified brands and installing electric thermal storage heaters.

Distributors who offered low-income related CDM programs urged the continuation of such efforts as they believe there are many opportunities available for future savings. It was suggested that by integrating low-income CDM programs into mass market offerings, bountiful savings would be accrue.

9. SYSTEM PROGRAMS AND STUDIES

Dollars Spent (\$M)	MWh Saved	MW Saved
\$18.5	112,224	15.7

In an effort to help reduce overall system constraints, distributors invested in programs and studies to help investigate saving opportunities at the system level. The following is a sample of various programs undertaken by distributors over the third tranche CDM period:

- System optimization study;
- Renewable energy;
- Embedded generation;
- In-home display pilot; and
- Smart meter development pilot.

Many distributors reported the implementation of a system optimization study at one point or another during the tenure of the third tranche CDM period. The goal of such a program was to help the utility get a better understanding of its system's shortfalls in order to reduce overall system losses. Distributors studied various aspects of their systems, including voltage conversion processes and to determine the benefits of increasing voltage levels in an attempt to reduce system losses. Most distributors were in agreement that the funds for system

optimization studies should continue to be made available, but from outside of conservation program budgets.

Other system programs and studies reported by distributors included renewable energy surveys, embedded generation programs and in-home display pilots. Studies on renewable energy technologies were fairly time consuming and required longer program lives in order for substantial gains to materialize in the area. Distributors however, did encourage the continuation of such studies as they felt many opportunities to reduce overall system constraints exist.

A small number of distributors took part in embedded generation programs. It was reported that by offering a monetary incentive, participants were more likely to engage in the program. Some distributors reported a significant potential for on-peak load reduction and saw very good returns from early program results.

10. SMART METER PILOT PROGRAMS

Many distributors undertook smart meter pilot studies to help them understand the issues surrounding the anticipated widespread implementation of the technology.⁸ Feedback from distributors was that program funds should continue to be made available, but from outside of approved conservation funding. It was noted repeatedly that the need to educate customers during the process of smart meter implementation will be critical to the overall effectiveness of the technology.

Overall, distributors reported spending approximately \$17.3M on smart meter development studies and pilot programs.

11. UNCONVENTIONAL PROGRAMS

For recording purposes, distributors included various appendices as part of their annual reports when filing CDM results with the Board. Funds that were spent on conservation activities that could not be easily associated with a specific group (i.e., residential, industrial or commercial, etc.) were recorded in the columns titled "Other 1" or "Other 2". Within the "Other" groups, distributors listed unconventional programs including education and generation projects. In total, approximately \$13 million was reported to be spent on unconventional CDM programs.

⁸ Smart meter CDM projects were limited to pilots or studies. The installation of smart meters in furtherance of the government's smart metering initiative did not form part of third tranche CDM activities.

12. COST EFFECTIVENESS

Included in the Board's decisions approving distributors' third tranche CDM plans was the consideration of cost effectiveness. The Board noted in its decision on December 10, 2004 to the Coalition of Large Distributors ("CLD") that "there is an understandable inability to provide the Board with cost-benefit analysis that would be meaningful."⁹ Because of this, the Board did not make cost-effectiveness a requirement for approval when reviewing distributors third tranche CDM plans. However, within the reporting requirements, the Board required distributors to file information pertaining to the cost effectiveness of its programs. As such, distributors provided information relating to cost effectiveness within their annual CDM reports to the Board.

By examining the benefit-to-cost ratios reported in distributors' 2008 CDM annual reports, the programs delivered to Ontarians were generally done so in a cost effective manner. The simple average of the reported benefit-to-cost ratios was approximately 2.86. This figure includes all programs, including both educational and marketing programs which typically yield lower cost benefit results.

13. REMAINING BALANCES

The original closing date to have approved funds for third tranche CDM expenditures exhausted was September 30, 2007. Some distributors requested extensions to the original deadline. The Board received and approved approximately forty applications to extend the completion date of third tranche CDM expenditures. The applications requested extensions to various dates in 2008. The Board granted all of these requests.

Currently, there remains approximately \$800,000 of unspent approved third tranche CDM funds across all distributors. The reasons for any material remaining balances will be examined with the relevant distributors.

In regards to CDM deferral accounts 1565 and 1566, the Board will address how they will be handled in future proceedings.

14. GENERAL OBSERVATIONS BY DISTRIBUTORS

Within distributors' 2008 annual report filings, many noted that the level of awareness by consumers has increased greatly from the beginning of CDM programs in 2005. It has been found that as electricity prices increase, conservation is increasingly becoming a higher priority for consumers in all sectors. The ability to feel a sense of control over the electricity bill was a

⁹ December 10, 2004, RP-2004-0203, vol 3.

centrally reported theme amongst distributors' customers, however, it was noted that customers generally are apprehensive when it comes to sacrificing comfort. This will be an area in which distributors will need to work with their customers to provide programs they will find useful but not overly intrusive on their lifestyle.

In order to develop a culture of conservation, it was reported that a fundamental component will be for distributors to partner with other energy providers when offering awareness programs in order to convey common messages and themes. It was noted by many distributors that consistent messaging is needed early and often to make sure all sectors are on the same page and have a clear understanding of what they can expect to find offered from the distributor. By sharing information amongst each other, distributors felt that much can be gained and that it is a very important function in achieving desired successes of conservation programs.

Distributors agreed that programs administered by them directly have faster implementation timelines. Distributors believe they have demonstrated that they are the most effective channel in reaching their customers for engagement in CDM programs. Although a steep learning curve existed early in program delivery, the ability for the distributor to control the process from the start of a CDM program was seen as a positive factor in developing programs that would be delivered to the marketplace efficiently and effectively. It was noted that amongst the rate classes, the residential sector seemed to have the fastest uptake of conservation programs. Distributors found that standardized CDM programs, where feasible, were easier for customers to understand and undertake and easier for the distributor to administer.

While it took more time, generally one to two years, it was reported that business customers eventually became aware of and interested in participating in conservation efforts. By providing incentives, distributors found that program participation is much more feasible for larger use customers, particularly institutional customers (i.e., universities and colleges). It was also found that energy audits offered to industrial and commercial users at low or no cost were very effective. Distributors also noted that by aligning program timing with customers' budget cycles, commercial, industrial and institutional involvement in conservation activities was much more prevalent.

Many distributors found that there was difficulty when quantifying the effects of advertising and the development of a conservation culture. This was also true when administering educational and informational conservation programs within the residential sector and to schools. Constant messaging to all consumers that conservation efforts will continue into the foreseeable future was viewed as important.

With respect to a utility's resources, many reported that they were challenged when trying to meet the reporting requirements associated with their CDM

programs as well as the various other tasks associated with developing, planning and implementing CDM programs. In most cases, the hiring of external consultants or incremental internal resources was necessary to assist with program management and delivery. Distributors reported that it was very important and helpful to learn from other jurisdictions and from the experiences of other distributors in the province. Distributors found that by partnering with organizations that have experience with targeted technologies and/or targeted customers, existing skills and knowledge was brought forth when developing conservation programs. The ability to develop and maintain reliable resources (both internal and external) was something that the majority of distributors agreed will be critical in the ongoing delivery of CDM programs.

It was noted repeatedly that by having the ability to develop local conservation programs and enrol in province-wide offerings, conservation efforts will be maximized. All utilities agreed that multi-year funding is not only desirable, but necessary, when moving forward as it reduces uncertainty and allows for strategic longer-term planning of budgets and programs and allows for an efficient use of a utility's resources. Distributors reported that on-going funding also ensures the continuation of the momentum that current conservation efforts have built and will prove beneficial to the overall conservation movement and the conservation culture that has been established in Ontario. Distributors reported that although there was some reluctance from consumers at the beginning of their conservation efforts, the ability to provide conservation programs ended up being a positive addition to a distributors' business.