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**Analysis of Conservation and  
Demand Management Results in Ontario**

**August, 2010**

1 **1.0 Overview**

2  
3 This report presents a detailed analysis of Conservation and Demand Management  
4 (CDM) programs using available information as of July 2010. The analysis was prepared  
5 to help assess the CDM impact on the load forecast.  
6

7 The CDM impact on the load forecast can be grouped in the following way:

- 8 • CDM impact resulting from programs initiated by the Ontario Power Authority  
9 (OPA);
- 10 • CDM impact resulting from programs initiated by local distribution companies  
11 (LDCs);
- 12 • CDM impact resulting from programs initiated by other agencies, such as federal  
13 and provincial governments;
- 14 • CDM impact resulting from actions initiated by Ontario electricity consumers on  
15 their own that are above and beyond the natural conservation efforts assumed in  
16 the load forecast. These conservation actions are difficult to measure because they  
17 are not program specific and therefore the savings are not easily measureable.  
18

19 The Ontario government set a summer peak reduction target of 1,350 MW for 2007 and  
20 another 1,350 MW for 2010. CDM program results reported by the OPA and the results  
21 of the study undertaken by Hydro One show that Ontario electricity consumers met the  
22 provincial government's peak reduction target for 2007. Recent analysis also shows that  
23 Ontario is well on its way to achieving the peak target of 1,350 MW in 2010.  
24

25 Survey results from Hydro One and the OPA show that Ontario electricity consumers  
26 have participated in CDM programs offered by the OPA, LDCs and other government  
27 agencies and have taken various conservation actions on their own to save electricity.  
28 Future evaluation, measurement and verification (EMV) efforts by the OPA will be able  
29 to confirm the success achieved by Ontario electricity consumers. The following sections  
30 provide a summary of the program results recently reported by the OPA, CDM analysis  
31 undertaken by Hydro One, as well as details of CDM programs to be initiated by the  
32 OPA for the period up to 2014.

## 2.0 CDM Results Reported by OPA

This section summarizes the CDM program results reported by the OPA to date. In July 2008 Ontario's Chief Energy Conservation Officer (CECO) reported that based on "reported" results at the end of 2007 the province had met the peak demand reduction target of 1,350 MW for 2007.<sup>1</sup> Table 1 provides cumulative CDM Results from 2005 to 2007 as reported by the CECO for both OPA and non-OPA programs.

**Table 1: Reported Cumulative CDM Results 2005 -2007**

Conservation Activities	Estimated Demand Reduction 2005-2007
	(megawatts)
Ontario Power Authority's portfolio of programs:	
Mass market	130
Commercial/institutional	150
Industrial (demand response) <sup>1,2</sup>	317
Customer-based generation <sup>1,3</sup>	1
LDC programs (not OPA-funded)	257
Natural gas companies	38
Non-governmental and other organizations	30
IESO demand response/dispatchable load program	273
Provincial regulations	1
Federal buildings/programs	117
Enwave deep lake water cooling	56
Energy management companies	21
<b>Total</b>	<b>1,391</b>

Source: Ontario Power Authority "2007 Results – Supplement conservation Results 2005 -2007", Page10

It is important to note that these CDM results do not capture the CDM savings from other conservation activities and programs such as:

- Naturally occurring conservation;
- New building codes and equipment standards;
- Communication and education programs initiated by other agencies;

<sup>1</sup> CECO's, "Annual Report 2007 Supplement: Conservation Results 2005-2007" (June 2008) can be found on the OPA website at:  
[http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=6564&SiteNodeID=139&BL\\_ExpandID=](http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=6564&SiteNodeID=139&BL_ExpandID=)

- Conservation actions initiated by customers that are above and beyond natural conservation.

Total reported provincial CDM savings for 2005 to 2007 would be higher if these initiatives were taken into account.

In January 2009, the OPA released their final conservation results for 2007.<sup>2</sup> Despite some revisions, the results confirm that the province reached its first goal of a 1,350 MW peak demand reduction by 2007. Table 2 shows the final cumulative OPA CDM results for 2005 to 2007.

**Table 2: Final Cumulative CDM Results 2005 -2007**

Conservation programs	Demand Reduction (MW)
2006 OPA programs (reported savings)	18
2007 OPA programs	568
<i>6 evaluated programs (verified savings)</i>	<i>390</i>
<i>6 non-evaluated programs (reported savings)</i>	<i>178</i>
Non-OPA programs (2005-2007)	793
<b>Total</b>	<b>1379</b>

Source: Ontario Power Authority, “2007 OPA Conservation Programs- Evaluation Results”, Page 4

Table 3 below gives a detailed description of where adjustments were made to the OPA’s 2007 results based on verification of 6 programs.

**Table 3: Comparison of Preliminary and Final OPA 2007 Program Results**

	Preliminary results (MW) (CECO June 2008 report)	Final results (MW) (Post EM&V process)
Programs	Reported savings: 12 programs	Reported savings: 6 programs Verified savings: 6 programs
Mass market	130	87
Commercial/ institutional	150	135
Industrial/ demand response	317	344
Customer based generation	1	2
<b>TOTAL</b>	<b>598</b>	<b>568</b>

<sup>2</sup> OPA’s “2007 Final Conservation Results” (February 2009) can be found on the OPA website at: [http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=6563&SiteNodeID=139&BL\\_ExpandedID=](http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=6563&SiteNodeID=139&BL_ExpandedID=)

2  
3 In January 2010, the OPA released final conservation results for OPA-funded  
4 conservation programs implemented in 2008<sup>3</sup>. 2008 is the most recent year for which the  
5 OPA has released conservation results. The report states that:

6  
7 "The OPA's conservation portfolio achieved 387 MW of peak-demand reduction  
8 and 386 gigawatt-hours (GWh) of annual energy savings as a result of 2008  
9 conservation activities, indicating progress toward the next interim target of an  
10 additional 1,350 MW of peak-demand reduction by 2010."<sup>4</sup>

11  
12 This report includes only OPA-funded program results and does not include savings from  
13 other conservation activities and programs as mentioned earlier. As a result, total  
14 provincial CDM savings for 2008 will be higher than the 387 MW reported for OPA-  
15 funded programs. A summary of CDM results reported by LDCs to the OEB between  
16 2005 and 2008 can be found in Appendix A. The next section describes a special study  
17 undertaken by Hydro One to capture the total CDM impacts in the province, including  
18 impacts which are difficult to measure.

### 19 20 **3.0 Special Study Undertaken by Hydro One**

21  
22 This section summarizes the results of a special study undertaken by Hydro One to  
23 measure the load impact of CDM programs in Ontario. An econometric analysis was used  
24 to measure the impact of CDM programs on summer peak for 2004 and 2009 using the  
25 hourly load profile analysis approach. This is the same approach used by Hydro One in  
26 the 2009-2010 Transmission rate application (EB-2008-0272, Exhibit A, Tab 14,  
27 Schedule 3, Attachment C).

28  
29 Two separate approaches were used. The first analysis looks at all transmission  
30 connected customers including LDCs and direct customers (large industrial customers  
31 with > 5 MW of load). The second analysis removes the impact of direct customers. This  
32 second analysis is considered to be a more conservative approach to calculating CDM

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<sup>3</sup> OPA's "2008 Final Conservation Results" (January 2010) can be found on the OPA website at:  
[http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=7145&SiteNodeID=139&BL\\_ExpandID=](http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=7145&SiteNodeID=139&BL_ExpandID=)

1 results because it eliminates the impact of the 2008-2009 recession on large industrial  
2 customers.

3  
4 The objective of these analyses is to measure the load impact of all CDM activities on  
5 Ontario's peak load. Hydro One chose the Load Profile Analysis Model to measure the  
6 cumulative CDM impact by 2009 as compared to 2004 base year. The detailed data  
7 assumptions, analytical methodologies and results are presented in the following sections.

### 8 9 **Data**

10 The main variables used in the model are weather, day type, and economic factor  
11 (monthly GDP). The "before and after CDM" load profile are weather normalized hourly  
12 load shapes. The difference between these two load shapes is the CDM impact. The  
13 following historical data were used as inputs into the models:

- 14 • Hourly load data for Ontario from 2004 to 2009
- 15 • Actual hourly weather data (temperature) for 2004-2009
- 16 • Normalized monthly and hourly weather data (temperature) for 2004-2009
- 17 • Monthly GDP for 2004-2009

### 18 19 **Methodology**

20 The econometric analysis includes the following steps:

21 **Step 1:** Linear regression analysis was used to model the hourly loads<sup>5</sup>. The functional  
22 form of the load shape for each hour  $i$  ( $i=1, 2, \dots, 24$ ) is:

$$23 \quad \text{Actual Load hour } i = f\{CDD, HDD, \text{Day Type}, GDP\}$$

24 **Step 2:** "Weather and economic impact adjustments" were computed using the coefficients  
25 derived from the above regression analysis.

26 **Step 3:** "Normalized" hourly loads from 2004 to 2009 were then generated using the above  
27 "adjustments" to remove the abnormal weather and economic impacts.

28 **Step 4:** Annual normalized energy was calculated using the normalized hourly load profile  
29 for 2004 to 2009. Load factor was applied to calculate the normalized summer peak for

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<sup>4</sup> Ontario Power Authority, "2008 Final Conservation Results", Page 1.

<sup>5</sup> The first approach uses the hourly load for all transmission connected customers while the second approach excludes the loads for direct customers.

1 2004 to 2009. The difference between the normalized summer peak for the year 2004 to  
2 2009 is the impact of CDM.

### 3 4 **Results**

#### 5 ***Analysis of CDM Peak Demand Impact - Including Direct Customers***

6 Table 4 presents the cumulative CDM impact (MW) for 2005 to 2009. These results  
7 include all transmission connected customers including LDCs and direct customers.

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11  
12 **Table 4: Cumulative CDM Impact for 2005-2009**  
13 **For All Hydro One Customers**

Year	Peak Saving (MW)
2005	724
2006	1,675
2007	2,324
2008	2,553
2009	3,322

#### 14 15 ***Analysis of CDM Peak Demand Impact - Excluding Direct Customers***

16 Table 5 presents the cumulative CDM impact (MW) for 2005 to 2009. These results  
17 include all transmission connected customers *except* direct customers and represent a  
18 more conservative estimation of CDM results.

19  
20 **Table 5: Cumulative CDM Impact for 2005-2009**  
21 **Excluding Direct Customers**

Year	Peak Saving (MW)
2005	533
2006	1,217
2007	1,722
2008	1,791
2009	1,978

### 22 23 **Conclusion of Hydro One Analysis**

1 The econometric analysis shows that the province achieved between 1,978 MW and  
2 3,322 MW of peak reduction between 2004 and 2009. The analysis is consistent with  
3 results from the OPA which indicate that Ontario has successfully achieved the target  
4 peak demand reduction of 1,350 megawatts by 2007. This analysis suggests that the  
5 province is well on its way to achieving the second target of another 1,350 megawatts by  
6 2010.

7

1 **4.0 CONSERVATION ACTIONS INITIATED BY CUSTOMERS**

2  
3 CDM programs initiated by the OPA, LDCs, and other federal and provincial  
4 governments are mostly program-specific and as such the program results are tracked and  
5 measured. Conservation actions initiated by customers on their own contribute to CDM  
6 savings but are difficult to measure because there are no specific evaluations to capture  
7 these impacts. For example, it is very difficult to measure the “cultural change”  
8 associated with the CDM education and communication materials circulated by LDCs  
9 and other agencies (see Appendix B for details).

10  
11 Hydro One Distribution undertook CDM surveys in 2007 and 2009 to confirm what  
12 conservation actions its retail customers have undertaken since 2004. Detailed analysis of  
13 the survey results can be found in Appendix C. Based on the survey results, it is clear  
14 that Ontario electricity consumers have responded to the conservation challenge, have  
15 participated in CDM programs offered by the OPA, LDCs and other government  
16 agencies and have taken various conservation actions on their own to save electricity.  
17 Hydro One’s survey results are consistent with the survey undertaken by the OPA in  
18 2008 (see Appendix D for details).

19  
20 **5.0 FUTURE CDM PROGRAMS**

21  
22 For future CDM programs, Hydro One Networks uses the CDM impacts provided by the  
23 OPA consistent with the IPSP submitted to the Board in August 2007. Table 6  
24 summarizes the CDM programs by type of initiative. Further details by region, end-use  
25 profile and program are provided in Appendix E.

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27  
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29  
30 **Table 6: Identified Saving Potential on System Peak (MW) and**  
31 **Energy Saving Potential (TWh)**

	System Peak Savings (MW)					Energy Savings (TWh)				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014

Energy Efficiency	623	886	1149	1412	1675	3.5	4.8	6.2	7.5	8.8
Fuel Switching	70	87	104	121	139	2.4	2.9	3.4	3.8	4.3
Customer-based Generation Conservation Behaviour	148	156	164	172	180	0.9	1	1	1.1	1.1
Demand Management	0	0	0	0	0	0	0	0	0	0
Total Proposed Savings	566	606	647	687	728	0.1	0.1	0.1	0.1	0.1
	1407	1735	2064	2393	2721	6.9	8.8	10.7	12.4	14.3

1 Source: Ontario Power Authority IPSP Pre-filed evidence in EB-2007-0707, Exhibit D, Tab4, Schedule 1, Attachment  
2 4, Table 3 and Table 4

3  
4

5 Table 7 presents the forecasted savings for province-wide programs under Tier 1  
6 Conservation Programs. Savings from LDC Tier 2 and 3 programs and from Smart  
7 Meters will be in addition to the forecasted savings shown in the table.<sup>6</sup>

8  
9

10 **Table 7: Forecasted Savings on System Peak (MW) by Sector (Tier 1 Only)**

11

**2014 Summer Peak Demand Savings (MW)**

Program	Resource Type		
	Energy Efficiency	Demand Response	Total
Consumer Program	127	192	319
Low Income	6	0	6
Business Program	418	80	498
Industrial Program	71	143	214
<b>Portfolio Total</b>	<b>622</b>	<b>416</b>	<b>1,037</b>

12  
13

Source: OPA LDC Web-enabled teleconference, "Tier 1 Conservation Programs Webinar Series", July 2010.

<sup>6</sup> OPA LDC Web-enabled teleconference, "Tier 1 Conservation Programs Webinar Series", July 2010, <http://sn.na4.acrobat.com/p59683322/>

**Appendix A: CDM Results Initiated by Local Distribution Companies**

This appendix summarizes the CDM results reported to the OEB by LDCs between 2005 and 2008. Table A1 provides a “bottom up” view of the CDM impact for each LDC between 2005 and 2008 as reported on the OEB website.

**Table A1:**

**Cumulative LDC CDM Program Results 2005-2008**

LDC	Cumulative Peak Saved (kW)	Cumulative Energy Saved (kWh)
Barrie Hydro Distribution Inc.	557	4,616,820
Bluewater Power Distribution Corporation	53	240,876
Brant County Power Inc.	355	1,846,935
Brantford Power Inc.	160	1,158,760
Burlington Hydro Inc.	235	3,155,386
Cambridge and North Dumfries Hydro Inc.	2,149	8,469,478
Centre Wellington Hydro Ltd.	165	838,693
Chatham-Kent Hydro Inc.	353	420,823
Clinton Power Corporation	0	741,852
COLLUS Power Corporation	503	1,968,869
Cooperative Hydro Embrun Inc.	2,850	329,115
E.L.K. Energy Inc.	0	737,837
Enersource Hydro Mississauga Inc.	13,451	57,543,882
ENWIN Utilities Ltd.	3,995	31,845,969
Erie Thames Powerlines Corporation	43	1,039,417
Essex Powerlines Corporation	3,206	5,833,075
Festival Hydro Inc.	245	3,819,208
Grand Valley Energy Inc.	61	289,326
Grimsby Power Incorporated	161	1,600,156
Guelph Hydro Electric Systems Inc.	1,740	11,328,554
Haldimand County Hydro Inc.	172	877,699
Halton Hills Hydro Inc.	110	52,668
Horizon Utilities Corporation	4,626	40,465,778
Hydro 2000 Inc.	192	221,773
Hydro Hawkesbury Inc.	0	152,062
Hydro One Brampton Networks Inc.	985	43,422,480
Hydro One Networks	67,429	284,575,293
Hydro Ottawa Ltd.	7,167	77,922,277
Innisfil Hydro Distribution Systems Limited	12	106,409
Kenora Hydro Electric Corporation Ltd.	84	302,583
Kingston Hydro Corporation	91	475,824
Kitchener-Wilmot Hydro Inc.	2,878	30,422,994
Lakefront Utilities Inc.	390	1,953,139
Lakeland Power Distribution Limited	331	1,962,497
London Hydro Inc.	8,726	109,531,929
Middlesex Power Distribution Corporation	113	292,301
Midland Power Utility Corporation	220	1,699,367
Milton Hydro Distribution Inc.	661	1,185,995
Newmarket-Tay Power Distribution Ltd. - Main	159	34,248

<b>LDC</b>	<b>Cumulative Peak Saved (kW)</b>	<b>Cumulative Energy Saved (kWh)</b>
Niagara-on-the-Lake Hydro Inc.	180	610,161
Norfolk Power Distribution Inc.	446	2,013,376
North Bay Hydro Distribution Limited	2	11,513,832
Oakville Hydro Electricity Distribution Inc.	153	11,199,029
Orangeville Hydro Limited	40	683,276
Orillia Power Distribution Corporation	770	1,318,696
Oshawa PUC Networks Inc.	1,245	3,134,923
Ottawa River Power Corporation	61	1,809,485
Parry Sound Power Corporation	67	1,025,807
Peterborough Distribution Incorporated	3,342	10,001,523
PowerStream Inc.	11,872	32,855,417
PUC Distribution Inc.	75	3,520,740
Renfrew Hydro Inc.	40	258,311
Rideau St. Lawrence Distribution Inc.	153	686,807
St. Thomas Energy Inc.	169	577,601
Thunder Bay Hydro Electricity Distribution Inc.	1,417	6,693,525
Toronto Hydro -Electric System Limited	68,520	262,371,278
Veridian Connections Inc.	1,147	18,618,718
Wasaga Distribution Inc.	346	1,042,365
Waterloo North Hydro Inc.	546	6,510,457
Welland Hydro-Electric System Corp.	232	2,856,861
Wellington North Power Inc.	38	536,569
West Coast Huron Energy Inc.	60	128,966
West Perth Power Inc.	0	28,560
Westario Power Inc.	497	4,409,981
Whitby Hydro Electric Corporation	1,359	9,061,028
Woodstock Hydro Services Inc.	456	3,138,979

1

2 Source: OEB website for CDM results by LDCs

1 **Appendix B: CDM Education and Communication Programs**

2  
3 This appendix describes the CDM education and communication programs and activities  
4 offered by Hydro One Distribution, the OPA, and other government agencies.

5  
6 **Hydro One Distribution**

7 In the past few years, Hydro One Distribution has used bill inserts, newspapers, special  
8 events, conferences and workshops, radio and TV series, fact sheets, energy efficiency  
9 guides, brochures, on-line energy audits and direct mail to promote energy efficiency and  
10 conservation. The availability of this information will help our customers build the  
11 “conservation culture”. Please visit [www.PowerSaver.ca](http://www.PowerSaver.ca) for more information.

12  
13 Table B1 shows all energy conservation related bill inserts sent out to customers in 2005  
14 by Hydro One.

15  
16 **Table B1: Distribution of Bill Inserts and Energy Saving Tips in 2005**

Topic	Printed and distributed pieces (000s)
Home Energy Efficiency Grant	22
Switch to Cold – 1	1,215
Switch to Cold – 2	1,215
Lighten Your Electricity Bill	1,215
<b>Total</b>	<b>3,667</b>

17 Source: Hydro One Communications Department

18  
19 Compared to 2005, Hydro One in 2006 distributed 18% more inserts and energy saving  
20 tips with customer’s monthly bills. Table B2 below lists all the energy saving or  
21 conservation related inserts sent to customers.

22  
23 **Table B2: Distribution of Bill Inserts and Energy Saving Tips in 2006**

Topic	Printed and distributed pieces (000s)
Staying Connected - Winter '05	1,215
Staying Connected - Spring '06	1,215
Staying Connected - Summer '06	1,215
Power Cost Monitors	140
Power Cost Monitors v2	140
Cold Shoulder Fridge Retirement	350

SmartStat P. Thermostats	25
Don't be a Fridge Magnet	22
LED Traffic Lights	1
LED Traffic Lights	1
LED Light Exchange	1
<b>Total</b>	<b>4,325</b>

Source: Hydro One Communications Department

In 2007, the number of energy saving bill inserts more than doubled in comparison to 2006. Table B3 provides details of inserts sent to customers in 2007.

**Table B3: Distribution of Bill Inserts and Energy Saving Tips in 2007**

Topic	Printed and distributed pieces (000s)
Staying Connected - Winter 06-07	1,215
Staying Connected - Summer '07	1,215
Staying Connected - Fall '07	1,215
Smartstat thermostat, Zones 1&2	150
Online Appliance Survey	100
Cold Shoulder Fridge Retirement	1,500
10/10 Summer Savings program	950
Peaksaver thermostat program	1,215
OPA Great Refrigerator Roundup	1,500
PowerSaverPlus for Residential & Business Customers	1,500
Electricity Retrofit Incentive Program – ERIP	15
ERIP	15
ERIP promotional card on heavy stock	11
<b>Total</b>	<b>10,609</b>

Source: Hydro One Communications Department

Table B4 presents all energy conservation related bill inserts sent out to customers in 2008 by Hydro One.

**Table B4: Distribution of Bill Inserts and Energy Saving Tips in 2008**

Topic	Printed and distributed pieces (000s)
Staying Connected - Spring '08	1,215
Staying Connected - Fall '08	1,215
Summer Sweepstakes cover letter	80
Summer Sweepstakes program	1,001
OPA Great Refrigerator Roundup	1,650

PowerSaverPlus for Residential & Business Customers	1,650
PeakSaver program	1,100
Electricity Retrofit Incentive Program - ERIP	93
PowerSavings Blitz	15
Double Return	2
Conserving Energy Together	5
<b>Total</b>	<b>8,026</b>

Source: Hydro One Communications Department

Table B5 presents all energy conservation related bill inserts sent out to customers in 2009 by Hydro One.

**Table B5: Distribution of Bill Inserts and Energy Saving Tips in 2009**

<b>Topic</b>	<b>Printed and distributed pieces (000s)</b>
Staying Connected - Spring '09	1,215
Staying Connected - Fall '09	1,215
Great Refrigerator Roundup	2,744
Double return for Business Customers	2
PowerSaverPlus for Residential & Business Customers	1,650
Power Savings Blitz for Business Customers	95
Electricity Retrofit Incentive Program – ERIP	21
Peaksaver Program	390
Smart Meter	480
<b>Total</b>	<b>7,812</b>

Source: Hydro One Communications Department

### **Ontario Power Authority**

The OPA also undertakes several initiatives to educate consumers about conservation and to support the effectiveness of its conservation programs. In 2008, these initiatives included:

- Conservation awareness activities such as Energy Conservation Week, Conservation Awareness Day at Rogers Centre, Media Events and Greeting Card Contests;
- Market research;
- Education and training activities;
- The Conservation Fund and Technology Development Fund.

1

2 Results of a June 2008 Ipsos Reid poll indicated that 73% of Ontario residents were  
3 aware of Energy Conservation Week and 50% participated in an energy conservation  
4 activity during the week.<sup>7</sup>

5

6 More information on OPA initiatives can be found on their website at:

- 7 • OPA - <http://www.powerauthority.on.ca>

8

9 **Other Sources**

10 In addition to Hydro One Distribution and OPA CDM education and communication  
11 program and activities, similar CDM materials and communication programs are offered  
12 by other government agencies. They can be found on the following websites:

- 13 • Office of Energy Efficiency - <http://oee.nrcan.gc.ca>  
14 • Ministry of Energy - <http://www.energy.gov.on.ca>  
15 • Powerwise - <http://www.powerwise.ca>

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<sup>7</sup> See Ontario Power Authority, “2008 Final Conservation Results”, Page 11.

## **Appendix C: CDM Surveys Undertaken by Hydro One**

This appendix summarizes the key results of two surveys initiated by Hydro One Distribution. The main objective of the surveys was to assess the conservation actions, if any, undertaken by Hydro One Retail customers since 2004, particularly customer conservation actions that could not be easily captured by CDM programs initiated by Hydro One Distribution, OPA or other federal and provincial government agencies. The survey results clearly demonstrated that Ontario residential customers are taking energy-efficiency actions on their own.

The first survey was initiated between December 2007 and January 2008 and over 1,740 customers responded (39.2% response rate). The second survey was in 2009 and 2,829 customers responded (29.9% response rate). Both surveys clearly demonstrated that Ontario residential customers have continued to participate in the conservation challenge and have taken various conservation actions on their own to save electricity.

### **Conservation Culture**

The 2009 survey results are consistent with the 2007 survey results with respect to conservation culture. Both survey results show that Hydro One Distribution retail customers are increasingly taking conservation actions on their own, such as turning off lights when not required, using natural cooling (i.e. not using air conditioning), setting thermostat lower during the day, the night and when away, and using cold water for laundry.

These conservation actions save energy, but they are not easily measureable and the saving impacts are not properly captured.

<b>Conservation Action</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008*</b>	<b>2009*</b>
Use a programmable thermostat	38%	42%	47%	53%	57%	63%	69%
Set thermostat lower during the day and when away	65%	71%	75%	80%	82%	93%	93%
Set thermostat lower during the night	63%	69%	72%	77%	80%	91%	91%

Turn off air conditioner when not at home	39%	43%	48%	53%	56%	63%	70%
Natural cooling	68%	73%	77%	82%	85%	95%	95%
Regular maintenance of air conditioning	55%	59%	63%	67%	69%	63%	71%
Switch to non-electric space heating equipment	22%	25%	27%	29%	30%	38%	41%
Insulate electric water heater and pipes	34%	37%	40%	43%	46%	47%	52%
Use cold water doing laundry	49%	54%	62%	70%	75%	80%	91%
Switch to non-electric water heating equipment	22%	24%	25%	25%	26%	38%	41%
Turn off lights when not required	85%	90%	91%	95%	96%	96%	96%
Use timer for indoor lights	25%	27%	29%	30%	31%	37%	41%
Use timer for outdoor lights	36%	39%	43%	45%	48%	48%	53%
Use a dimmer switch	45%	48%	51%	53%	55%	64%	69%
Use motion sensor	36%	39%	43%	45%	46%	50%	55%
Switch to LED holiday lights	8%	12%	23%	45%	56%	70%	78%
Switch to other LED lights	4%	3%	6%	11%	14%	35%	41%
Use timer on pool pump or heater	7%	8%	9%	10%	11%	11%	12%
Use insulating or solar blanket to keep the pool water warm	11%	12%	13%	14%	15%	13%	14%
Switch to non-electric pool heating	-	-	-	-	-	4%	5%
Hang clothes to dry	54%	57%	61%	63%	65%	74%	83%
Wash dishes by hand	46%	48%	51%	53%	55%	56%	63%
Air sealing and weatherization	37%	41%	47%	52%	54%	64%	71%
Control other equipment with timers	11%	11%	12%	13%	15%	24%	27%

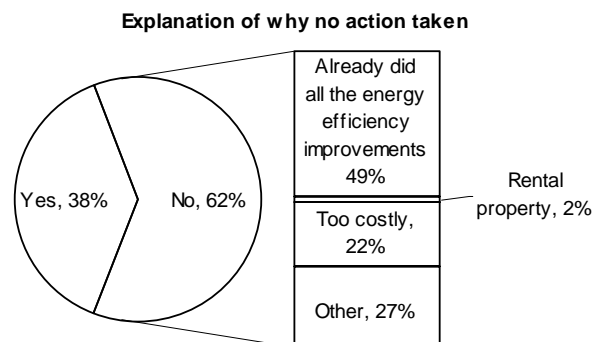
1 Note: \*2008 and 2009 data are based on results from the 2009 CDM survey; the rest are based on results  
2 from the 2007 CDM survey.

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4 **Participation in Conservation programs in 2008 or 2009**

- 5 • In Question 1 of the 2009 survey, 38% of the survey respondents said they  
6 participated in CDM programs in 2008 or 2009.  
7 • For those who did not participate in any CDM programs in the 2008 or 2009,  
8 about half of the respondents said they had already done all the energy efficiency  
9 improvements already.

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Have you participated in any CDM programs in 2008 or 2009?	Percentage
Yes	38%
No	62%



- Survey results show about 25% of Hydro One customers plan to undertake conservation actions in the next two years (2010 and 2011).

Type of Conservation Action	Customers answered "No" in Question 1		Customers answered "Yes" in Question 1	
	Percent of customers who plan to do CDM	How much \$ they plan to spend per home	Percent of customers who plan to do CDM	How much \$ they plan to spend per home
Increased Home Insulation	23.4%	\$1,970	26.6%	\$1,881
Upgraded Windows / Skylights / Doors	29.2%	\$3,453	32.2%	\$3,862
Upgraded Heating System	14.7%	\$7,103	12.5%	\$5,059
Installed ENERGY STAR® Central AC	7.0%	\$2,950	7.2%	\$3,224
Installed ENERGY STAR® Window AC	3.6%	\$343	1.5%	\$342
Installed Energy Efficient Light Bulbs	57.7%	\$93	53.2%	\$73
Purchased ENERGY STAR® Appliances	28.1%	\$1,940	27.6%	\$1,459
Installed Programmable Thermostat	18.0%	\$111	11.4%	\$119
Others	15.5%	\$5,028	15.3%	\$4,447

### **Spill-over effects**

Survey results show a significant number of customers who undertook CDM actions without receiving incentives. This finding confirms that Hydro One Distribution retail customers are taking CDM actions on their own and these actions are not yet captured in CDM program results reported by Hydro One Distribution, the OPA or other programs initiated by the federal and provincial governments.

Conservation Actions	Number of customers in total	Number of customers who received incentives	Ratio for customers who did not receive incentives versus customers who received incentives
Increased Home Insulation	156	25	5.24
Upgraded Windows / Skylights / Doors	249	29	7.59
Upgraded Heating System	164	73	1.25
Installed ENERGY STAR® Central AC	49	20	1.45
Installed ENERGY STAR® Window AC	36	3	11.00
Installed Energy Efficient Light Bulbs	616	133	3.63
Purchased ENERGY STAR® Appliances	356	80	3.45
Installed Programmable Thermostat	200	64	2.13
Others	88	26	2.38

1 **Appendix D: CDM Survey Results Reported by the OPA**

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3 The OPA survey results show that the conservation efforts are similar to Hydro One  
4 distribution customers, indicating across Ontario most consumers are already conserving  
5 electricity at home and are adopting new conservation actions as time goes by. Table D1  
6 compares the OPA and Hydro One CDM survey results.

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8 **Table D1:**  
**Conservation Actions Adopted by Ontario Electricity Consumers**

<b>Conservation Action</b>	<b>H1 2007 CDM Survey</b>	<b>H1 2009 CDM Survey</b>	<b>OPA 2008 CDM Survey</b>
Set back thermostat	82%	93%	84%
Use cold water doing laundry	75%	91%	86%
Use CFLs or other energy efficient lights	81%	N/A	88%
Turn off lights when not in use	96%	96%	95%
Use a dimmer switch	55%	69%	51%
Hang clothes to dry	65%	83%	77%
Upgrade windows/door to prevent air leakage	48%	N/A	64%

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10 Source: OPA 2008 Electricity Conservation Program Study July 2008, Slide 34

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1 **Appendix E: OPA Conservation Program Portfolio 2010-2014**

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3 **Table E1: OPA Portfolio 2010-2014 by Region**

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	System Peak Savings (MW)					Energy Savings (TWh)				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
Northwest	64	76	86	96	105	0.2	0.3	0.4	0.5	0.5
West	161	196	231	265	300	0.7	0.9	1	1.2	1.4
Northeast	91	106	120	134	148	0.6	0.7	0.8	1	1.1
Essa	96	115	134	154	173	0.5	0.6	0.7	0.8	0.9
Ottawa	97	123	150	177	204	0.6	0.7	0.8	1	1.1
East	83	100	117	134	151	0.4	0.5	0.6	0.7	0.8
GTA	478	606	737	868	1000	2.5	3.2	3.8	4.5	5.1
Niagara	41	51	60	69	79	0.2	0.3	0.3	0.4	0.4
Southwest	296	363	429	495	561	1.3	1.7	2.1	2.4	2.8
Ontario	1407	1736	2064	2393	2721	6.9	8.8	10.6	12.4	14.3

5 Source: Ontario Power Authority IPSP Pre-filed evidence in EB-2007-0707, Exhibit D, Tab4, Schedule 1, Attachment  
6 4, Table 5 and Table 6

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**Table E2: OPA Portfolio 2010 by End Use Profile**

	<b>System Peak Savings (MW) in 2010</b>	<b>Energy Savings (TWh) in 2010</b>
Residential	213	1.4
Space Heating SFD	0	0.1
Space Heating AP/AT	0	-0.2
Room AC	8	0
Central AC	90	0.1
Furnace Fan	47	0.1
Lighting	35	1
Refrigeration	4	0
Freezer	3	0
Water Heating	5	0.1
Dish Washer	1	0
Clothes Waster/Dryer	4	0
Miscellaneous	16	0.2
Commercial/Institutional	302	1.3
Space Heating	0	0.1
Space Cooling	118	0.1
Ventilation	30	0.2
Lighting	146	0.9
Electric Auxiliary	5	0
Water Heating	3	0
Industrial	107	0.8
Process Machine Drive	45	0.4
Electrochemical Processes	1	0
Steam Production	0	0
Heat Production	38	0.3
HVAC	20	0.1
Lighting	3	0

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Source: Ontario Power Authority IPSP Pre-filed evidence in EB-2007-0707, Exhibit D, Tab4, Schedule 1, Attachment 4, Table 9