



# **PowerStream Inc.**

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## **Conservation and Demand Management Plan**

### **2008 Annual Report**

Ontario Energy Board File No. RP-2004-0203 / EB-2004-0486

March 31, 2009



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## 1. Introduction

On September 14<sup>th</sup>, 2007 PowerStream filed an application with the Ontario Energy Board (“the Board”) requesting approval to extend spending on certain third tranche Conservation and Demand Management (‘CDM’) programs from its original CDM Plan.

PowerStream’s original CDM plan was filed with the Board on November 4<sup>th</sup>, 2004 under docket number RP-2004-0203 / EB-2004-0486. This plan was based on investing approximately \$6.4 million in a combination of capital and operating expenses during the period of January 1<sup>st</sup>, 2004 to September 30<sup>th</sup>, 2007.

On November 1, 2005, PowerStream acquired Aurora Hydro Connections Ltd. (“Aurora Hydro”) with the closing of the purchase and sale. At that time, PowerStream assumed an obligation to execute Aurora Hydro’s approved CDM plan. In March of the following year, PowerStream submitted an application to the Board for an amendment to its electricity distribution licence to consolidate this acquired service territory under one licence. Board approval for this consolidation brought PowerStream’s CDM budget up to \$7.2 million. By the end of September 2007, PowerStream had spent nearly \$6.5 million of its consolidated budget.

With nearly \$750,000 unspent, on September 11<sup>th</sup>, 2007 PowerStream applied to the Board for an extension of its third tranche spending. Throughout this extension period, PowerStream’s main focus was to continue effort with four of its original CDM programs, which due to unforeseen circumstances required additional time to complete. These programs included: Design Advisory (<50 kW), Social Housing, Commercial Demand Response, and Distributed Energy. In addition to these programs, PowerStream contracted with the Ontario Power Authority (OPA) to deliver four provincial programs throughout its service territory. PowerStream’s goal was to continue leveraging the strong community partnerships that it began building in 2005 in an effort to help these partners deliver and promote the importance of energy conservation practices to stakeholders and the community at large.

In the Board’s letter to all electricity distributors, dated March 3<sup>rd</sup>, 2008, it was instructed to file an annual report regarding its CDM initiatives. Following that letter, this report includes program activity that took place with the four programs outlined above from the time period of September 30<sup>th</sup>, 2007 to September 30<sup>th</sup>, 2008. Within this period, PowerStream achieved another 967,157 annual kilowatt-hours through its Social Housing Program bringing total energy saved through its CDM efforts funded under third tranche of Market Adjusted Revenue Requirement (“MARR”) to just over 60 MWh.



### Summary of Third Tranche CDM Program Achievements<sup>1</sup>

	2005	2006	2007	2008	Total
<b>Investment (M)</b>	\$1.100	\$2.600	\$2.800	\$0.600	<b>\$7.165</b>
<b>MWh Saved</b>	3.100	23.400	33.100	1.000	<b>60.600</b>

PowerStream believes that CDM in the years ahead is vital to its success as a distribution company. As one of the fastest growing utilities in the country in terms of customer and load growth, PowerStream sees CDM as an essential instrument in managing load growth such that every new kilowatt of demand that the distribution system meets is an efficiently used kilowatt. For that important reason, many of the CDM programs discussed in this report are targeted at influencing market attitudes toward CDM and influencing design practices and approaches that bring new loads to the PowerStream system. In the long run, this is the surest way to sustainable load and economic growth.

## 2. Evaluation of Overall Plan

Refer to Appendix A for an evaluation of PowerStream's CDM activities during 2008.

In reviewing the information provided in Appendices A, B and C, it should be noted that PowerStream's primary focus in 2008 was program retirement and transitioning to Ontario Power Authority (OPA) provincial programs.

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<sup>1</sup> Both the investment and MWh figures have been rounded to the nearest 000's.



### 3. Discussion of the Programs

#### Residential and Small Commercial (< 50 kW)

##### Design Advisory Program/Audit Programs (<50 kW)

###### **Description**

This initiative helps to create an integrated approach to the design process for new buildings, and involves architects, engineers, building owners and design advisors.

###### **Target users**

Home builders in PowerStream's franchise area.

###### **Benefits**

This program results in cost effective improvements to the energy efficiency of a building without adversely affecting other performance requirements stipulated by the owner. More specifically, developers and designers can develop an energy performance model to demonstrate achievable energy savings and provide a breakdown of energy end-uses. Through the installation of energy efficient equipment during construction, the customer benefits by reducing energy bills and avoiding stranded costs incurred with future equipment upgrades.

#### **Discussion of 2008 Activities**

##### Action

- PowerStream began developing an incentive based program to encourage homebuilders in its franchise area to integrate electrical energy efficiency in the design of new homes.
- Builders who registered for the program could chose from three incentive levels: silver, gold and platinum. To receive a silver rating, the builder had to include CFLs, a *peaksaver*<sup>™</sup> enabled programmable thermostat, and dimmer switches. In addition to these items the gold rating required an EMC motor. With the platinum package builders were additionally required to install three ENERGY STAR<sup>®</sup> appliances.
- PowerStream developed marketing materials including brochures and product giveaways to help builders raise awareness and promote electrical energy conservation.

#### Results to Date

- PowerStream has discontinued further efforts for this program pending the development of an OPA New Construction Program.
- Interest in the program was high with three builders registering within the first four months of the program.

#### Next Steps

- No further activity is planned for this program.

### **Social Housing Program**

#### **Description**

A province wide centralized energy management service for the social housing sector will be assessed in collaboration with the Provincial Government, utilities (Enbridge) and others.

A pilot program will be conducted to determine feasibility with an expectation that a full-scale provincial program would follow.

#### **Target users**

Local social housing corporations, non-profit homes and co-op housing.

#### **Benefits**

Synergies will be created through the combined initiatives of the various agencies.

### **Discussion of 2008 Activities**

#### Action

- PowerStream engaged Green Light on a Better Environment (GLOBE) Inc. to deliver an In-suite CFL Installation Program to local social housing corporations.
- CFL bulbs were specified and chosen on a low mercury content basis.
- Disposal of the bulbs removed was completed in accordance with Region of York waste management policy.

#### Results to Date

- A total of 14,694 CFL bulbs were installed in 38 social housing corporations across the Region of York.



- Estimated program savings is 967,157 annual kilowatt-hours.

#### Next Steps

- No further activity is planned for this program.

### ***Commercial, Industrial and Institutional (> 50 kW)***

#### **Demand Response Initiative (Load Control)**

##### **Description**

Load control uses a real time communications link to enable or disable customer loads at the discretion of the utility. These controls are usually engaged during system peak periods or when required to relieve pressure on the system grid.

##### **Target Users**

Larger commercial, industrial and institutional customers.

##### **Benefit**

Load control allows customers to respond quickly to external price signals. This also provides a mechanism for utilities to relieve pressure on constrained areas within the distribution grid and also reduces the need to bring on large peaking generators.

#### **Discussion of 2008 Activities**

##### Action

- In 2007, the OPA announced its own province wide DR3 program. In effort to keep participants from PowerStream's own demand response program 'EnerShift' engaged in the program and transitioning them to the OPA's program, PowerStream continued to support and fund program activity.
- PowerStream continued working with existing program participants to achieve 7 MW of contracted demand.

##### Results to Date



- Worked closely with existing customers through the design build phase of their commercial buildings.

#### Next Steps

- No further activity is planned for this program.

## Distributed Energy Load Displacement

### **Description**

Distributed generation behind the customer's meter provides an excellent opportunity to displace load from the local distribution system's grid in a very effective manner. Load displacement technology, such as combined heat and power systems, provides increased power efficiency and thermal systems. Combined with an existing or new district heating distribution system this technology contributes to the development of sustainable energy networks within Ontario's communities.

Other technologies such as micro-turbines, wind, biomass fuels and solar provide additional options to meet the customer's needs. This initiative will facilitate the development and implementation of these opportunities. Financial incentives will be considered based on the project's viability.

Development of educational and technology programs in conjunction with local colleges and universities may be considered. Small pilots or demonstration projects to promote alternative and renewable energy sources may also be considered.

### **Target users**

Commercial, industrial, and residential, schools, colleges and universities.

### **Benefits**

Benefits include additional capacity within the grid. Cleaner technologies result in reductions in Green House Gas (GHG) emissions. Other benefits include improved system reliability, reduced harmonics, back-up power possibilities, education and skills development.

## **Discussion of 2008 Activities**

### Action

- Due to delays in the Ministry of Energy approval for 'non-emergency' use of the generator, PowerStream was required to continue its support with York Region's Aurora Pumping Station project.

### Results to Date

- PowerStream engaged Safety Power for the management of this project.
- Commissioning of all systems was completed in April 2008.



- PowerStream also completed the construction of solar and wind projects at its new head office. These projects contributed to the building's LEED® (Leadership in Energy and Environmental Design) gold standard rating.

#### Next Steps

- No further activity is planned for this program.

## 4. Lessons Learned

### Working Together

Throughout the four year period of its third tranche funded programs, PowerStream worked both independently and with members of the Coalition of Large Distributors (CLD) on the execution of its CDM plan. On CLD-related programs, a Steering Committee was established to oversee and coordinate joint actions, and program-specific working committees were constituted to promote the sharing of ideas, experiences and costs. PowerStream's experience in both contexts provided several important lessons, including:

#### Cost Sharing:

- In 2005 and 2006, CLD members worked together to develop and pilot innovative conservation and demand management programs, sharing costs and resources as required to ensure programs were delivered cost effectively. Once these programs demonstrated they were able to achieve measurable kilowatt-hour savings, they were transferred to the OPA as turnkey programs. The OPA benefits from this arrangement by not having to reinvent the wheel and not having to invest in program development. The lesson learned is that it can be cost effective to pilot programs in several key markets to test their ability to deliver results, rather than roll them out untested across the province.

#### Market Conditions:

- The ratepayer and a customer are often one and the same person. Instead of treating them as separate entities, it makes sense to work as closely as possible with municipalities and to leverage their existing infrastructure in an effort to communicate directly with ratepayers. There is no point in duplicating resources or reinventing the wheel. Equally, in PowerStream's experience, it is important to understand that working with municipalities and the social housing sector can require long lead-times. Therefore, programs involving these partners should be developed with a long view, as approvals, implementation and results can take time.
- It was a matter of serendipity that CLD members were asked to create CDM programs at a time when the prevailing zeitgeist was strongly in favour of energy conservation. If changing customers' behavior is the ultimate goal, then it helps to be in sync with the times. Reading the public's mindset, testing their tolerance for change and/or their resistance to it and benchmarking the extent to which the conservation culture is catching on, must be top priorities going forward.
- Ontario may be one province, but it is also a province of distinct communities. Creating 'one size fits all' programs and expecting them to work in all communities may be ill-advised. The preferred approach, given Ontario's diversity, is to acknowledge the existence of market niches and respond accordingly. Providing communities with a

range of 'one size fits all' OPA programs, in conjunction with custom LDC programs, makes good strategic sense.

- CLD members have been communicating the benefits of energy conservation since 2005 and have been consistent in introducing CDM programs with measurable results. Given public acceptance of CLD programs, we believe the time is right to introduce time-of-use (TOU) rates to the market. The longer this takes, the more dispirited customers are likely to become, given that many of them now have the tools but still are really not masters of their own energy destiny.
- The programs that have received the greatest media attention have been those that are community based. While shifting consumers' attitudes is difficult to measure, these programs also appear to have been the most successful. As a result, PowerStream will continue to endeavor to engage the media at an early stage in the development of market transformation programs.
- PowerStream underestimated the amount of time and resources (both internal and external) required to develop programs and engage PowerStream customers. This lesson will help us to understand resource requirements moving forward with both the OPA and the OEB.
- Commercial Load Control and Distributed Energy programs piloted as part of the CDM plan show great promise as a means of reducing electricity system demand but require considerable time and effort to overcome customer implementation barriers.

### **Marketing & Communications:**

- As indicated in our last report to the OEB, the need for additional resources in marketing and communications will continue to grow as new CDM programs are developed and piloted. Marketing these types of programs requires specialized skill sets. Going forward, the industry will have to work hard to attract candidates with the right type of skills and experience.
- CLD members were diligent in their efforts to foster solid relationships with media because they recognized the media's role in disseminating credible energy conservation messages to the public. CLD members are committed to continuing to build these relationships as a key part of their CDM strategy.

### **CDM Resources:**

- Increasingly, the energy sector will be competing for talent with Canada's broader labour market in the search for skilled knowledge workers, this at a time when a significant percentage of Canada's labour force is making plans for retirement. In order to continue building momentum, PowerStream recognizes the importance of finding the right workers, training them and keeping them. In addition, based on their work of

the past three years, PowerStream has identified a need for full-time dedicated CDM staff, not part-time people, to continue promoting and building Ontario's conservation culture. PowerStream is considering rate-basing future resources dedicated to CDM because of the difficulties in acquiring staff.

- There were a number of channel partners (i.e. manufacturer, distributors, delivery agents and consultants) that played a major role in facilitating many of the CDM initiatives. Their observations and experiences with the Ontario CDM marketplace are invaluable and should be understood in an effort to improve program design and deliver.

#### **Customer Care:**

- Throughout the program period (2005-2008) PowerStream experienced an increase in call volumes and with it, the opportunity to speak directly with customers about energy saving strategies that could result in lower electricity bills. PowerStream's challenge will be to continue to respond to calls quickly and efficiently, in keeping with regulatory requirements, while passing more customized conservation information on to callers. PowerStream may consider obtaining additional resources with more specific CDM related knowledge and skill to assist customers with on the phone inquiries.

#### **Regulatory Environment:**

- The energy industry must coordinate the individual efforts of its many organizations to ensure that program delivery is efficient, readily available and understood by all customers. Most customers don't understand the relationship among the various organizations within the hydro industry, so an attempt to deliver programs to the end customer by different groups only confuses the customer and suggests a lack of industry coordination. Clarity regarding the roles of the LDC, EDA, OEB, OPA and the IESO would be beneficial in this regard.
- In 2007, there was a gap between OEB funding and the start of OPA programs. The gap resulted in a loss of traction in the marketplace for program delivery. The key lesson learned is that once funding for a program begins, it shouldn't stop then restart; if this happens, the front-end costs increase as do overall development and implementation costs. Furthermore, all momentum is lost.
- The piloting of new technologies should be encouraged in the new CDM environment. Going forward, the CDM funding structure should allow for a R&D process to support the development of new energy saving technologies for LDCs willing to test market acceptance and application.
- The Total Resource Cost (TRC) test analysis became complicated with the introduction of the OPA's TRC Analysis tools and measures lists. Now that the OEB

has endorsed the OPA assumptions and measures list, we believe there will be consistency in the measurement of the cost effectiveness of CDM programs.

- The TRC test should not be the only economic test used for evaluating the merits of a conservation or demand management program. For example, the Societal Cost Test considers a much broader perspective by including other benefits such externalities (i.e. green house gas emissions).
- The regulatory requirements to electrical distribution companies should be consistent with those applied to the Ontario gas industry. This will encourage both sectors to work more closely together.
- Avoided costs are one of the most important components to the economic evaluation of a CDM initiative. If the values of these costs are underestimated potential CDM initiatives may be overlooked. The avoided costs used by the OEB and the OPA should be consistent and reflective of the true value to society.
- PowerStream appreciates the consistency that comes from working with the OEB. The rates-based process has allowed PowerStream to assign the right resources to the right priorities at the right time so that implementation and planning are as cost-effective as possible. However, there has been a learning curve with OEB reporting requirements. With a consistent framework in place for a longer period of time would allow LDCs to hire and train staffs to more effectively meet these requirements.
- As a deregulated industry with shareholders, it is worth remembering that PowerStream's shareholders expect some remuneration from CDM. All programs that we develop must balance the needs of market transformation and sustainability with the expectations our shareholders have for a consistent rate of return.

## 5. Conclusion

In 2008, PowerStream spent close to \$600,000, marking the remaining budget of the \$7.165 million CDM funding approved by the Board to implement its CDM plans across several fronts and customer segments. Over the course of a four-year period, PowerStream collaborated with other members from the CLD group to launch many initiatives in unison across our collective customer base, while other initiatives were implemented in PowerStream's service area alone.

In 2008, PowerStream achieved an additional 967,157 in annual kilowatt-hour savings bringing its total achieved savings to over 60 megawatt-hours over a five-year program period.

Of special note are the following significant achievements:

- Co-operative efforts among CLD members resulted in the sharing of ideas and consequently a better and more cost effective and efficient service to our customers.
- CDM funding has encouraged additional CDM initiatives and strong partnerships with Municipalities.
- Success of **No Catch to Conserve** program, piloted in PowerStream's service territory and accepted as a provincial program of the OPA in December 2007.
- Success of the **powerWISE<sup>®</sup> Business Incentive Program**, which contributed more than 45% of annual kWh savings in PowerStream's service area.
- Success of the **Build for Savings** program which attracted 3 builders within the first 4 months of launch.
- Positive media response to PowerStream's CDM programs, with local media giving consistent positive media coverage.

## Appendix A – Evaluation of the CDM Plan

	Total for 2008	Residential	<sup>5</sup> Low Income	Commercial	LDC System	Industrial	<sup>4</sup> Smart Meters
<i>Net TRC value (\$):</i>	\$1,016,889	\$102,939	\$102,939	\$0	\$0	\$913,950	
<i>Benefit to cost ratio:</i>	2.95	2.09	2.09	0.00	0.00	3.13	
<i>Number of participants or units delivered:</i>	14,695	14,694	14,694	0	0	1	
<i>Lifecycle (kWh) Savings:</i>	3,444,520	3,444,520	3,444,520	0	0	0	
<i>Report Year Total kWh saved (kWh):</i>	967,157	967,157	967,157	0	0	0	
<i>Total peak demand saved (kW):</i>	700	0	0	0	0	700	
<i>Total kWh saved as a percentage of total kWh delivered (%):</i>	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%	
<i>Peak kW saved as a percentage of LDC peak kW load (%):</i>	0.05%	0.00%	0.00%	0.00%	0.00%	0.05%	
<sup>1</sup> <i>Report Year Gross C&amp;DM expenditures (\$):</i>	\$596,433	\$112,100	\$112,100	\$56,223	\$0	\$428,110	\$0
<sup>2</sup> <i>Expenditures per kWh saved (\$/kWh):</i>	\$1	\$0	\$0	\$0	\$0	\$0	
<sup>3</sup> <i>Expenditures per kW saved (\$/kW):</i>	\$852	\$0	\$0	\$0	\$0	\$612	
			<b>2008</b>				
<i>Utility discount rate (%):</i>	7.30%	Total kWh delivered:	6,990,083,228				
		Peak kW load:	1,443,918				

<sup>1</sup> Expenditures are reported on accrual basis.

<sup>2</sup> Expenditures include all utility program costs (direct and indirect) for all programs which primarily generate energy savings.

<sup>3</sup> Expenditures include all utility program costs (direct and indirect) for all programs which primarily generate capacity savings.

<sup>4</sup> Please report spending related to 3rd tranche of MARR funding only. TRC calculations are not required for Smart Meters.

Only actual expenditures for the year need to be reported.

<sup>5</sup> Includes totals from Low Income programs that fall under both commercial and residential.

## Appendix B – Discussion of the Programs

### Design Advisory <50 kW

A. **Name of the Program:** Design Advisory < 50kW

**Description of the program (including intent, design, delivery, partnerships and evaluation):**

**Description**

• The 'Design Build' pilot program was designed to encourage builders in Powerstream's franchise area to improve the electrical energy efficiency potential of their homes.

**Target users**

• Home Builders

**Benefits**

• Through the installation of energy efficient lighting, furnace fans and appliances, builders can pass on energy conservation to new home buyers concerned about the environment,

**Measure(s):**

Base case technology:

Efficient technology:

Number of participants or units delivered for reporting year:

Measure life (years):

Number of Participants or units delivered life to date

<b>TRC Results:</b>		<b>Reporting Year</b>	<b>Life-to-date TRC Results:</b>
<sup>1</sup> TRC Benefits (\$):			\$ 195,645
<sup>2</sup> TRC Costs (\$):			
	Utility program cost (excluding incentives):		-\$ 75,030
	Incremental Measure Costs (Equipment Costs)		-\$ 66,407
	<b>Total TRC costs:</b>		<b>-\$ 141,438</b>
<b>Net TRC (in year CDN \$):</b>			<b>\$ 54,207</b>
<b>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</b>			<b>1.38</b>

C. **Results:** (one or more category may apply) **Cumulative Results:**

**Conservation Programs:**

Demand savings (kW):	Summer		133	
	Winter		103	
	lifecycle	in year	Cumulative Lifecycle	Cumulative Annual Savings
Energy saved (kWh):			2,276,183	418,024
Other resources saved :				
Natural Gas (m3):				
Other (specify):				

**Demand Management Programs:**

Controlled load (kW)		
Energy shifted On-peak to Mid-peak (kWh):		
Energy shifted On-peak to Off-peak (kWh):		
Energy shifted Mid-peak to Off-peak (kWh):		

**Demand Response Programs:**

Dispatchable load (kW):		
Peak hours dispatched in year (hours):		

**Power Factor Correction Programs:**

Amount of KVar installed (KVar):		
Distribution system power factor at beginning of year (%):		
Distribution system power factor at end of year (%):		

**Line Loss Reduction Programs:**

Peak load savings (kW):		
	lifecycle	in year
Energy savings (kWh):		

**Distributed Generation and Load Displacement Programs:**

Amount of DG installed (kW):		
Energy generated (kWh):		
Peak energy generated (kWh):		
Fuel type:		

**Other Programs (specify):**

Metric (specify):		
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D. <b>Actual Program Costs:</b>		<b>Reporting Year</b>	<b>Cumulative Life to Date</b>
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ 17,922	\$ 283,404
	Incentive:	\$ -	\$ 61,000
	Total:	\$ 17,922	\$ 344,404
Utility indirect costs (\$):	Incremental capital:		
	Incremental O&M:		
	Total:		

**E. Assumptions & Comments:**

Due to efforts being made by the Ontario Power Authority in the residential new home construction market, further program promotion was phased out in 2008.

<sup>1</sup> Benefits should be estimated if costs have been incurred and the technology has been deployed. Benefits reflect the present value of the measure for the number of units deployed in the year, i.e. the number of units times the net present value per unit benefit specified in the TRC Guide.

<sup>2</sup> For technologies which have not been deployed but for which the LDC has incurred costs, report only the TRC costs on a present value basis. Incentives (e.g. rebates) from the LDC to a customer are not a component of the TRC costs. However, payments made to a third party service provider to run an incentives program are program costs, and are to be included as TRC costs under the "Utility Program Costs" line.

## Social Housing

Name of the Program: Social Housing

Description of the program (including intent, design, delivery, partnerships and evaluation):

**Description**

- A province wide centralized energy management service for the social housing sector may be developed in collaboration with the Provincial Government, utilities (e.g. Enbridge, Union Gas) and others.
- A pilot program will be conducted to determine feasibility with an expectation that a full-scale provincial program would follow

**Target users**

- Local social housing corporations, non-profit homes and co-op housing.

**Benefits**

- Synergies will be created through the combined initiatives of the various agencies.

**Measure(s):**

	CFLs - 11 W	CFLs - 13 W	CFLs - 23 W
Base case technology:	Incandescent Lighting	Incandescent Lighting	Incandescent Lighting
Efficient technology:	CFL	CFL	CFL
Number of participants or units delivered for reporting year:	870	12529	1106
Measure life (years):	3	3	4
Number of Participants or units delivered life to date	870	12529	1106
	CFLs - 27 W		
Base case technology:	Incandescent Lighting		
Efficient technology:	CFL		
Number of participants or units delivered for reporting year:	189		
Measure life (years):			
Number of Participants or units delivered life to date			

**TRC Results:**

	Reporting Year	Life-to-date TRC Results:
TRC Benefits (\$):	\$ 197,117	\$ 554,991
TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ 94,178	\$ 251,356
Incremental Measure Costs (Equipment Costs)	\$ -	\$ 58,085
Total TRC costs:	\$ 94,178	\$ 309,441
Net TRC (in year CDN \$):	\$ 102,939	\$ 245,550

Benefit to Cost Ratio (TRC Benefits/TRC Costs): 2.09 1.55

**Results:** (one or more category may apply)

**Cumulative Results:**

**Conservation Programs:**

	Summer	Winter	Cumulative Lifecycle	Cumulative Annual Savings
Demand savings (kW):	0	0	135	38
Energy saved (kWh):	3,444,520	967,157	6,553,343	1,197,479
Other resources saved :				
Natural Gas (m3):				
Other (specify):				



**Demand Management Programs:**

Controlled load (kW)		
Energy shifted On-peak to Mid-peak (kWh):		
Energy shifted On-peak to Off-peak (kWh):		
Energy shifted Mid-peak to Off-peak (kWh):		

**Demand Response Programs:**

Dispatchable load (kW):		
Peak hours dispatched in year (hours):		

**Power Factor Correction Programs:**

Amount of KVar installed (KVar):		
Distribution system power factor at beginning of year (%):		
Distribution system power factor at end of year (%):		

**Line Loss Reduction Programs:**

Peak load savings (kW):		
	<i>lifecycle</i>	<i>in year</i>
Energy savings (kWh):		

**Distributed Generation and Load Displacement Programs:**

Amount of DG installed (kW):		
Energy generated (kWh):		
Peak energy generated (kWh):		
Fuel type:		

**Other Programs (specify):**

Metric (specify):		
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**Actual Program Costs:**

		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ 94,178	\$ 268,856
	Incentive:		
	Total:	\$ 94,178	\$ 268,856
Utility indirect costs (\$):	Incremental capital:		
	Incremental O&M:		
	Total:		

**Assumptions & Comments:**

The CFL In-Suite Installation Program was facilitated on behalf of Powerstream by Globe Inc. Number of measure installations was reported by Globe Inc. Input assumptions are those provided by the OEB Measure List.

Benefits should be estimated if costs have been incurred and the technology has been deployed. Benefits reflect the present value of the measure for the number of units deployed in the year, i.e. the number of units times the net present value per unit benefit specified in the TRC Guide.

For technologies which have not been deployed but for which the LDC has incurred costs, report only the TRC costs on a present value basis. Incentives (e.g. rebates) from the LDC to a customer are not a component of the TRC costs. However, payments made to a third party service provider to run an incentives program are program costs, and are to be included as TRC costs under the "Utility Program Costs" line.

## Load Control (DR) >50 kW

A. **Name of the Program:** Load Control (DR) > 50kW

**Description of the program (including intent, design, delivery, partnerships and evaluation):**

**Description**  
 •Load control uses a real time communications link to enable or disable customer loads at the discretion of the utility. These controls are usually engaged during system peak periods or when required to relieve pressure on the system grid.

**Target Users**  
 •Larger commercial, industrial and institutional customers.

**Benefit**  
 •Demand control provides lower costs and increased stability for customers and utilities.

<b>Measure(s):</b>	Measure 1 (if applicable)	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:			
Efficient technology:			
Number of participants or units delivered for reporting year:			
Measure life (years):			
Number of Participants or units delivered life to date			

<b>B. TRC Results:</b>	Reporting Year	Life-to-date TRC Results:
<sup>1</sup> TRC Benefits (\$):	\$ -	\$ 1,185,371
<sup>2</sup> TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ -	-\$ 297,715
Incremental Measure Costs (Equipment Costs)	\$ -	-\$ 425,000
Total TRC costs:	\$ -	-\$ 722,715
<b>Net TRC (in year CDN \$):</b>	\$ -	\$ 462,656
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	#DIV/0!	1.64

<b>C. Results:</b> (one or more category may apply)	Cumulative Results:			
<b>Conservation Programs:</b>				
Demand savings (kW):	Summer			
	Winter			
	lifecycle	in year	Cumulative Lifecycle	Cumulative Annual Savings
Energy saved (kWh):				
Other resources saved :				
Natural Gas (m3):				
Other (specify):				

**Demand Management Programs:**

Controlled load (kW)		
Energy shifted On-peak to Mid-peak (kWh):		
Energy shifted On-peak to Off-peak (kWh):		
Energy shifted Mid-peak to Off-peak (kWh):		

**Demand Response Programs:**

Dispatchable load (kW):	0	5,000
Peak hours dispatched in year (hours):	0	200

**Power Factor Correction Programs:**

Amount of KVar installed (KVar):		
Distribution system power factor at beginning of year (%):		
Distribution system power factor at end of year (%):		

**Line Loss Reduction Programs:**

Peak load savings (kW):		
	lifecycle	in year
Energy savings (kWh):		

**Distributed Generation and Load Displacement Programs:**

Amount of DG installed (kW):	0	
Energy generated (kWh):		
Peak energy generated (kWh):		
Fuel type:		

**Other Programs (specify):**

Metric (specify):		
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D. <b>Actual Program Costs:</b>		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ 40,799
	Incremental O&M:	\$ 56,223	\$ 355,461
	Incentive:		
	Total:	\$ 56,223	\$ 396,261
Utility indirect costs (\$):	Incremental capital:		
	Incremental O&M:		
	Total:		

**E. Assumptions & Comments:**

Powerstream continued to work with its commercial customers until the Ontario Power Authority announced its DR3 program. Promotion of Powerstream's Enershift' program was phased out in 2008.

<sup>1</sup> Benefits should be estimated if costs have been incurred and the technology has been deployed. Benefits reflect the present value of the measure for the number of units deployed in the year, i.e. the number of units times the net present value per unit benefit specified in the TRC Guide.

<sup>2</sup> For technologies which have not been deployed but for which the LDC has incurred costs, report only the TRC costs on a present value basis. Incentives (e.g. rebates) from the LDC to a customer are not a component of the TRC costs. However, payments made to a third party service provider to run an incentives program are program costs, and are to be included as TRC costs under the "Utility Program Costs" line.

## Distributed Energy

A. **Name of the Program:** Distributed Energy

**Description of the program (including intent, design, delivery, partnerships and evaluation):**

**Description**

▪ Distributed generation behind the customer's meter provides an excellent opportunity to displace load from the local distribution system's grid in a very effective manner. Load displacement technology, such as combined heat and power systems, provides increased power efficiency and thermal systems. Combined with an existing or new district heating distribution system this technology contributes to the development of sustainable energy networks within Ontario's communities.

▪ Other technologies such as micro-turbines, wind, biomass fuels and solar provide additional options to meet the customer's needs. This initiative will facilitate the development and implementation of these opportunities. Financial incentives will be considered based on the project's viability.

▪ Development of educational and technology programs in conjunction with local colleges and universities may be considered. Small pilots or demonstration projects to promote alternative and renewable energy sources may also be considered.

**Target users**

▪ Commercial, industrial, and residential, schools, colleges and universities.

**Benefits**

▪ Benefits include additional capacity within the grid. Cleaner technologies result in reductions in Green House Gas (GHG) emissions.

**Measure(s):**

	Generator	Measure 2 (if applicable)	Measure 3 (if applicable)
<i>Base case technology:</i>	Do nothing		
<i>Efficient technology:</i>	Generator		
<i>Number of participants or units delivered for reporting year:</i>	1		
<i>Measure life (years):</i>	20		
<i>Number of Participants or units delivered life to date</i>	1		

B. <b>TRC Results:</b>	Reporting Year		Life-to-date TRC Results:
	<sup>1</sup> TRC Benefits (\$):	\$ 1,342,060	\$ 4,095,883
<sup>2</sup> TRC Costs (\$):			
Utility program cost (excluding incentives):	\$ 428,110	\$ 1,310,726	
Incremental Measure Costs (Equipment Costs)		\$ 800,000	
<b>Total TRC costs:</b>	<b>\$ 428,110</b>	<b>\$ 2,110,726</b>	
<b>Net TRC (in year CDN \$):</b>	<b>\$ 913,950</b>	<b>\$ 1,985,157</b>	
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>	<b>\$ 3.13</b>	<b>4.08</b>	

C. <b>Results:</b> (one or more category may apply)	Cumulative Results:			
	Conservation Programs:		Cumulative Lifecycle	Cumulative Annual Savings
<i>Demand savings (kW):</i>	Summer			
	Winter			
	<i>lifecycle</i>	<i>in year</i>		
<i>Energy saved (kWh):</i>				
<i>Other resources saved :</i>				
Natural Gas (m3):				
Other (specify):				

**Demand Response Programs:**

Dispatchable load (kW):	0
Peak hours dispatched in year (hours):	0

**Power Factor Correction Programs:**

Amount of KVar installed (KVar):	
Distribution system power factor at beginning of year (%):	
Distribution system power factor at end of year (%):	

**Line Loss Reduction Programs:**

Peak load savings (kW):		
	<i>lifecycle</i>	<i>in year</i>
Energy savings (kWh):		

**Distributed Generation and Load Displacement Programs:**

Amount of DG installed (kW):	700	3.091
Energy generated (kWh):	0	7.703.042
Peak energy generated (kWh):	0	
Fuel type:		

**Other Programs (specify):**

Metric (specify):		
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D. <b><u>Actual Program Costs:</u></b>		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ 363,369	\$ 505,698
	Incremental O&M:	\$ 64,741	\$ 862,817
	Incentive:		
	Total:	\$ 428,110	\$ 1,368,516
Utility indirect costs (\$):	Incremental capital:		
	Incremental O&M:		
	Total:		

**E. Assumptions & Comments:**

<sup>1</sup> Benefits should be estimated if costs have been incurred and the technology has been deployed. Benefits reflect the present value of the measure for the number of units deployed in the year, i.e. the number of units times the net present value per unit benefit specified in the TRC Guide.

<sup>2</sup> For technologies which have not been deployed but for which the LDC has incurred costs, report only the TRC costs on a present value basis. Incentives (e.g. rebates) from the LDC to a customer are not a component of the TRC costs. However, payments made to a third party service provider to run an incentives program are program costs, and are to be included as TRC costs under the "Utility Program Costs" line.



# Appendix C – Program and Portfolio Totals

Report Year: **2008**

## 1. Residential Programs

List each Appendix B in the cells below; Insert additional rows as required.

Note: To ensure the integrity of the formulas, please insert the additional rows in the middle of the list below.

	TRC Benefits (PV)	TRC Costs (PV)	\$ Net TRC Benefits	Benefit/Cost Ratio	Report Year Total kWh Saved	Lifecycle (kWh) Savings	Total Peak Demand (kW) Saved	Report Year Gross C&DM Expenditures (\$)
Co-Branded Mass Market	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Load Control < 50kW	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Social Housing	\$ 197,117	\$ 94,178	\$ 102,939	2.09	967,157	3,444,520	0	\$ 94,178
Design Advisory < 50 kW	\$ -	\$ -	\$ -	0.00				\$ 17,922
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
<b>*Totals App. B - Residential</b>	<b>\$ 197,117</b>	<b>\$ 94,178</b>	<b>\$ 102,939</b>	<b>2.09</b>	<b>967,157</b>	<b>3,444,520</b>	<b>0</b>	<b>\$ 112,100</b>
Residential Indirect Costs not attributable to any specific program								
<b>Total Residential TRC Costs</b>		\$ 94,178						
<b>**Totals TRC - Residential</b>	<b>\$ 197,117</b>	<b>\$ 94,178</b>	<b>\$ 102,939</b>	<b>2.09</b>				

## 2. Commercial Programs

List each Appendix B in the cells below; Insert additional rows as required.

Note: To ensure the integrity of the formulas, please insert the additional rows in the middle of the list below.

	TRC Benefits (PV)	TRC Costs (PV)	\$ Net TRC Benefits	Benefit/Cost Ratio	Report Year Total kWh Saved	Lifecycle (kWh) Savings	Total Peak Demand (kW) Saved	Report Year Gross C&DM Expenditures (\$)
Energy AR&P	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Lev. En. Cons & Load Mgt	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Load Control (DR) >50kW	\$ -	\$ -	\$ -	0.00	0	0	0	\$ 56,223
Design Advisory > 50kW	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
<b>*Totals App. B - Commercial</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$ 56,223</b>
Commercial Indirect Costs not attributable to any specific program								
<b>Total TRC Costs</b>		\$ -						
<b>**Totals TRC - Commercial</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>0.00</b>				

## 3. LDC System Programs

List each Appendix B in the cells below; Insert additional rows as required.

Note: To ensure the integrity of the formulas, please insert the additional rows in the middle of the list below.

	TRC Benefits (PV)	TRC Costs (PV)	\$ Net TRC Benefits	Benefit/Cost Ratio	Report Year Total kWh Saved	Lifecycle (kWh) Savings	Total Peak Demand (kW) Saved	Report Year Gross C&DM Expenditures (\$)
Distributed Loss Reduction	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
	\$ -	\$ -	\$ -	0.00				
<b>*Totals App. B - LDC System</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$ -</b>
LDC System Indirect Costs not attributable to any specific program								
<b>Total TRC Costs</b>		\$ -						
<b>**Totals TRC - LDC System</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>0.00</b>				

## 4. Smart Meters Program

Only spending information that was authorized under the 3rd tranche of MARR is required to be reported for Smart Meters.

Report Year Gross C&DM Expenditures (\$)



### 5. Industrial Programs

List each Appendix B in the cells below; Insert additional rows as required.

Note: To ensure the integrity of the formulas, please insert the additional rows in the middle of the list below.

	TRC Benefits (PV)	TRC Costs (PV)	\$ Net TRC Benefits	Benefit/Cost Ratio	Report Year Total kWh Saved	Lifecycle (kWh) Savings	Total Peak Demand (kW) Saved	Report Year Gross C&DM Expenditures (\$)
Distributed Energy	\$ 1,342,060	\$ 428,110	\$ 913,950	3.13	0	0	700	\$ 428,110
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
			\$ -	0.00				
<b>*Totals App. B - Industrial</b>	<b>\$ 1,342,060</b>	<b>\$ 428,110</b>	<b>\$ 913,950</b>	<b>3.13</b>	<b>0</b>	<b>0</b>	<b>700</b>	<b>\$ 428,110</b>
<i>Industrial Indirect Costs not attributable to any specific program</i>								
<b>Total TRC Costs</b>		\$ 428,110						
<b>**Totals TRC - Industrial</b>	<b>\$ 1,342,060</b>	<b>\$ 428,110</b>	<b>\$ 913,950</b>	<b>3.13</b>				

### LDC's CDM PORTFOLIO TOTALS

	TRC Benefits (PV)	TRC Costs (PV)	\$ Net TRC Benefits	Benefit/Cost Ratio	Report Year Total kWh Saved	Lifecycle (kWh) Savings	Total Peak Demand (kW) Saved	Report Year Gross C&DM Expenditures (\$)
<b>*TOTALS FOR ALL APPENDIX B</b>	<b>\$ 1,539,177</b>	<b>\$ 522,288</b>	<b>\$ 1,016,889</b>	<b>2.95</b>	<b>\$ 967,157</b>	<b>\$ 3,444,520</b>	<b>\$ 700</b>	<b>\$ 596,433</b>
<i>Any other Indirect Costs not attributable to any specific program</i>		\$ -						
<b>TOTAL ALL LDC COSTS</b>		\$ 522,288						
<b>**LDC' PORTFOLIO TRC</b>	<b>\$ 1,539,177</b>	<b>\$ 522,288</b>	<b>\$ 1,016,889</b>	<b>2.95</b>				

\* The savings and spending information from this row is to be carried forward to Appendix A.

\*\* The TRC information from this row is to be carried forward to Appendix A.



## Appendix D – Total Life Evaluation of the CDM Plan

	<sup>5</sup> Cumulative Totals Life-to-date	Residential	<sup>6</sup> Low Income	Commercial	Institutional	Industrial	Agricultural	LDC System	
<i>Net TRC value (\$):</i>	<b>\$9,029,163</b>	<b>\$5,215,545</b>	<b>\$245,550</b>	<b>\$2,851,665</b>	<b>\$48,003</b>	<b>\$913,950</b>			
<i>Benefit to cost ratio:</i>	<b>1.98</b>	3.03	8.61	1.49	1.12	3.13			
<i>Number of participants or units delivered:</i>	<b>181,390</b>	178,701	16,040	2,684	4	1			
<i>Lifecycle (kWh) Savings:</i>	<b>246,510,322</b>	127,664,064	8,303,343	109,393,202	9,453,055	0			
<i>Total kWh saved (kWh):</i>	<b>32,855,417</b>	16,908,208	5,072,821	15,500,023	447,186	0			
<i>Total peak demand saved (kW):</i>	<b>11,872</b>	1,752	203	9,324	96	700			
<i>Total kWh saved as a percentage of total kWh delivered (%):</i>	<b>0.07%</b>	0.03%	0.01%	0.03%	0.00%	0.00%			
<i>Peak kW saved as a percentage of LDC peak kW load (%):</i>	<b>0.20%</b>	0.03%	0.00%	0.16%	0.00%	0.01%			
<i><sup>1</sup> Gross C&amp;DM expenditures (\$):</i>	<b>\$7,165,409</b>	\$2,310,080	\$174,677	\$2,586,411	\$342,635	\$1,368,515	\$557,768		
<i><sup>2</sup> Expenditures per kWh saved (\$/kWh):</i>	<b>\$0.22</b>	\$0.14	\$0.03	\$0.17	\$0.77	-			
<i><sup>3</sup> Expenditures per kW saved (\$/kW):</i>	<b>\$604</b>	\$1,319	\$859	\$277	\$3,569	\$1,955			
				<b>2005</b>	<b>2008</b>	<b>2007</b>	<b>2008</b>	<b>Total</b>	
<i>Utility discount rate (%):</i>	2005	6.50%	<b>Total kWh Delivered:</b>	6,599,939,661	6,990,083,228	7,174,400,000	6,990,083,228	<b>48,535,672,572</b>	
	2006	7.30%							
	2007	7.30%		<b>System Peak</b>	1,392,359	1,443,918	1,518,593	1,443,918	<b>5,798,788</b>
	2008	7.30%							

1 Expenditures are reported on cumulative basis.

2 Expenditures include all utility program costs (direct and indirect) for all programs which primarily generate energy savings.

3 Expenditures include all utility program costs (direct and indirect) for all programs which primarily generate capacity savings.

4 Please report spending related to 3rd tranche of MARR funding only. TRC calculations are not required for Smart Meters. Actual expenditures for the total third tranche period need to be reported.

5 Includes total for the reporting year, plus prior years, if any (for example, 2008 CDM Annual report for third tranche will include 2007, 2006, 2005 and 2004 numbers, if any).

6 Includes totals from Low Income programs that fall under both commercial and residential.