

2006 Annual Report
CDM Third Tranche Funding, Peterborough Distribution Inc.

ED-1999-0238
March 31, 2007

Introduction

Our Conservation and Demand Management program for 2006 included progress on the following six initiatives:

Installation of Thermal Storage Electric Heaters

In co-operation with the local social housing authority, the LDC provided financial, technical and administrative assistance to convert 124 electrically heated units from baseboard electric heating to electric thermal storage heating.

The non-ducted heaters are designed to heat the room or area into which they are placed. During off-peak hours, heaters convert electricity into heat and store that heat in specially designed high-density ceramic bricks capable of storing vast amounts of heat for extended periods of time. A fan inside the unit circulates this stored heat evenly and quietly as the room thermostat calls for heat.

Radio Signals to Control Appliances and Shift Usage to Off Peak Periods

We have developed a radio signal system that may be used by customers to control appliances and shift discretionary use of electricity to off peak times. The signals are currently provided at no cost to the customer and will automatically disable appliances connected to the in-home controller and enable the appliance at an 'off peak' time. Appliances such as electric water heaters, dishwashers, pool pumps, clothes washers and electric dryers may be controlled, but have a manual override button to permit the customer to use the appliance during a control period if necessary.

Energy Star Appliance Promotion

This program provides a rebate incentive to customers purchasing new 'Energy Star' rated appliances. It is a continuation of the original rebate program which we applied for to assist customers forced to replace

appliances after the July 2004 Flood. The program involves the customer completing a form and bringing in the receipt. Customer Service activity involves researching that the appliance qualifies as an Energy Star appliance and applying the rebate to the customer's utility account.

Appliance retailers participated in the program by notifying customers that it was available and by providing forms.

Appliance Load Monitors

The LDC provides the loan of load monitors to customers who use them to measure how much energy is being used by various appliances and devices within their home or business. Customers are asked to complete a form providing information on which appliance(s) they monitored and what action they expect to take to reduce consumption or demand.

This is an educational tool intended to help customers be more prudent with their hydro consumption.

Public Education Programs

Our goal is to promote electrical safety, conservation and demand management through participation in trade shows, home shows and advertisement through various media.

At present the LDC provides a safety program to all of the schools within its service territory. This program will be augmented to provide electricity conservation along with the safety messages.

Lighting for Social Housing

A new initiative for 2006, which we just started reporting on in the third quarter, involves the replacement of incandescent light bulbs with compact fluorescent light bulbs in 1688 Social Housing units.

Evaluation of the CDM Plan

Please see enclosed Appendix A.

Discussion of the Program

Please see enclosed Appendix B for each of the CDM programs worked on in 2006

Lessons Learned

The lessons learned in the 2006 Conservation and Demand Management year are as follow:

Storage Heating

Challenges Faced

- As Social Housing pays for heat in these units, there is a risk of tenants not giving adequate consideration to the savings benefit. ie. Opening a window instead of turning down the heat. Educating the tenants of the overall benefit mitigates this risk
- Peterborough Housing was cautious in allowing the implementation of this program. It was a challenge to convince them of the benefits of this initiative without up front documentation and history to substantiate the benefits they could expect. Being new technology, this was unavailable and was a learn as you go experience for both of us.
- An upgrade required to the heating service panel was not originally anticipated and cut into the budget
- After installation of heaters at the tops of stairs, we were notified that this did not comply with building code as they increased a potential hazard of young children climbing up and over the adjacent retaining wall and falling into the stairs. This was rectified but building the unit up to the same height as the retaining wall.

Customer Reaction

- The tenants were by and large indifferent, as they did not experience direct benefit.
- There were some comments made about the increased size of the heaters taking up more space than the old baseboard heaters.
- Peterborough Housing was very pleased with the results.

Benefits to Customers

- The tenants benefited from an overall warmer and improved heating system. The difference was the fan within the unit circulating the heat.
- Peterborough Housing benefited from an upgraded electrical panel and heating system.
- This initiative has helped us educate our customers and raise their awareness of the benefits of energy conservation.
- The LDC continues to be pleased with the load shifted to off peak by this initiative

Conclusion

- This initiative has allowed us to extend our past experience with shifting demand from on peak to off peak by using radio control signals through the SCADA program. We were pleasantly surprised at how much of the load was actually shifted to off peak by the implementation of this initiative.
- We have been able to demonstrate the savings to the social housing authority because of the availability of Smart Metering and Time of Use rates
- This initiative was successful in shifting consumption from on peak to off peak in partnership with the local municipality however, in accordance with the requirements of the TRC, the benefits calculated reflect a savings of consumption but not of demand.
- This initiative has been completed. The benefits will continue to be realized for the remainder of each 18 year unit life.

Radio Signal

Challenges Faced

- We had a difficult time finding customers able or willing to participate. Older homes were not wired to Code and finished basements made it difficult to fit in the additional electric panel required. We also targeted our test group to customers who had rental water heaters further limiting the available participants.

Customer Reaction

- We have found that this initiative requires more administration time than expected as customers have many questions and request information on how the program works and the potential benefits and savings.
- Customers appreciate the educational aspect regardless of the savings potential of this program.
- Most participants are reporting that although their appliances and water heating are shut off during certain times of the day, it is not causing an inconvenienced.

Benefits to Customers

- The benefit is the ability to shift consumption from 'On Peak' to 'Off Peak' times and therefore reducing rates. Total benefit is dependant on the individual consumption pattern of each customer. There is also a community and provincial benefit with overall shift of consumption to off peak.
- The value of installed equipment per home is approximately \$ 1,500.
- We have currently installed 126 units including 58 to water heaters in Social Housing units. We are planning completion of an

additional 98 units in 2007 of which 66 will be to Social Housing water heaters. The number of appliances being controlled is 314.

Conclusion

- For the pilot, we initially targeted customers that are committed to conservation and demand management. In the general population, our success may be slightly less definite.
- More public education will attract further participants
- Installing a smart meter at these residences and providing TOU rates readily demonstrates the financial savings to our participants
- We had originally hoped that once Smart Metering had been fully deployed, this program would continue on a rental/lease basis for new customers installations. Currently, we are unconvinced that customers will choose to pay for the ability of us controlling their appliances when they have the ability of controlling most appliance use on their own.
- We intend to continue with this initiative for the remainder of the CDM plan.

Energy Star

Challenges Faced

- There was confusion initially since appliances were labeled Energy Star but did not qualify according to the catalogue or website. Coordination with appliance retailers was required so that they communicated to customers that models had to qualify officially for the Energy Star Rebate program
- It took longer than expected to do the research to make sure that the appliance that was purchased by the customer was in fact an energy star appliance and met with the requirements. We found that by using the website for the list of energy star appliances, it provided us with the most up to date list and was much more efficient than looking it up in the catalogue that became outdated quickly
- At first we rebated a straight \$50 per appliance, however, some customers were requesting a \$50 rebate on a \$60 appliance. We changed our policy to pay 15% of the appliance cost with a maximum of \$50.

Customer Reaction

- The program participation rate has been favourable.
- A large frustration for customers was the fact that some appliances were labeled as Energy Efficient but did not qualify for the Energy Star rebate. The reasons were numerous including 1) United States rating being different than Canada's 2) Old stock bearing

Energy Star label which no longer applies due to increased standards 3) Retailers giving misleading or inaccurate information

Benefits to Customers

- This program has been successful in generating interest in Energy Star appliances and encouraging customers who might have focused on other appliance features to consider energy efficiency as part of the purchase decision.
- To date we have provided rebates on approximately 1246 appliances and anticipate an additional 414 in 2007.

Conclusion

- A rebate program will become less effective as appliance retailers start carrying only Energy Star appliances.
- It is expected that we will be able to disburse the number of appliance rebates for which we budgeted.
- We intend to continue with this initiative for the remainder of the CDM plan.

Load Monitor

Challenges Faced

- We found that, although there is a fair amount of public interest, customers are busy and tend not to make a special trip to pick up a load monitor. By making the load monitors more accessible to the public for pick up and drop off, we would increase the participation rate, however, we would lose valuable information on customer results and their anticipated action plan
- We created an in-house reporting program that reduced the manual collection of data and produced more information to aid in the annual reporting
- We intend to continue with this initiative for the remainder of the CDM plan.

Customer Reaction

- Experience to-date is that customers who take advantage of the monitor are residential. Customers report that they will use the offending appliance more carefully by turning it off/down or that they intend to replace the appliance.

Benefits to Customers

- Based on experience to-date, we estimate that the number of participants is likely to be approximately 724 over the 3-year life of the program. Currently, 522 customers have borrowed a load monitor.

- This initiative is break-even in financial terms but provides the intangible benefits of educating customers in addition to giving them the means to make an individual direct contribution to energy conservation. It will provide an energy conservation benefit but the financial benefit to the consumer is offset by the incremental cost of the energy-efficient appliance.
- We will continue taking a load monitor to any high bill complaint locations to help resolve the complaint

Conclusion

- We intend to continue with this initiative for the remainder of the CDM plan.

Public Education

Customer Reaction

- Customers are generally happy to do their part in conversation and feel good about contributing. They are open to knowledge and suggestions on how they can do their part.

Benefits to Customers

- Benefits are recognized in the other initiatives within the CDM portfolio and there costs are related to marketing and advertising

Conclusion

- Knowledge is always beneficial. We will continue with this initiative for the remainder of the CDM plan. The costs of this program are attributable to all other initiatives

Lighting for Social Housing

Challenges Faced

- There is a risk of losing ground over time by tenants not giving consideration to the savings benefit of CFL bulbs and replacing burned out bulbs with cheaper Incandescent bulbs. This risk may be increased by the fact that many Social Housing tenants do not have to pay for their own electricity and would not see direct benefit. Providing a supply of replacement CFL bulbs to Social Housing Caretakers as well as educating both Social Housing and their tenants of direct and indirect savings associated with this program has mitigated the risk.

Customer Reaction

- Customers really appreciate the program and like the new lighting.
- We are finding that most customers are anxious to do their part in conservation.

Benefits to Customers

- The lighting program brings many benefits to the City of Peterborough, the tenants of Social Housing, and Peterborough Distribution Inc. These include Energy reduction (kWh), environmental savings (GHG), cost savings for tenants, local employment, reduced bulb replacement (5 year life expectancy 8000 hours), and recycling of incandescent bulbs.

Conclusion

- This is an uncomplicated yet very effective program with a large cost to benefit ratio. We will continue this initiative.

Conclusion of the 2006 Conservation and Demand Management Year

- Our CDM plan continues to be a success. It enabled us to learn about our individual initiatives and, importantly, to learn about smart meters, its associated technologies and the billing of TOU rates.
- We find that customers are interested in energy conservation but need encouragement to take action in achieving energy savings.
- We underestimated how long it takes to implement initiatives in general and how onerous it is to report on the initiatives.

Appendix A - Evaluation of the CDM Plan

Highlighted boxes are to be completed manually, white boxes are linked to Appendix C and will be brought forward automatically.

	⁵ Cumulative Totals Life Cycle	Total for 2006	Residential	Commercial	Institutional	Industrial	Agricultural	LDC System	⁴ Smart Meters	Other #1	Other #2
<i>Net TRC value (\$):</i>	1945243.949	\$ 1,904,713	\$ 1,904,713	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
<i>Benefit to cost ratio:</i>	2.47	2.77	2.77	0.00	0.00	0.00	0.00	0.00		0.00	0.00
<i>Number of participants or units delivered:</i>	53689	27111	27111	\$0	\$0	\$0	\$0	\$0		\$0	\$0
<i>Lifecycle (kWh) Savings:</i>	21,280,539.52	18,356,815	18,356,815	0	0	0	0	0		0	0
<i>Report Year Total kWh saved (kWh):</i>	2,008,391	367,020	367,020	0	0	0	0	0		0	0
<i>Total peak demand saved (kW):</i>	2,012	2,012	2,012	0	0	0	0	0		0	0
<i>Total kWh saved as a percentage of total kWh delivered (%):</i>	0.24%	0.04%	0.04%	\$0	\$0	\$0	\$0	\$0		\$0	\$0
<i>Peak kW saved as a percentage of LDC peak kW load (%):</i>		1.34%	1.34%	\$0	\$0	\$0	\$0	\$0		\$0	\$0
¹ <i>Report Year Gross C&DM expenditures (\$):</i>	\$650,647	\$ 650,647	\$ 650,647	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
² <i>Expenditures per kWh saved (\$/kWh):</i>	\$ 0.32	\$ 1.77	\$ 1.77	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
³ <i>Expenditures per kW saved (\$/kW):</i>	\$ 323.31	\$ 323.31	\$ 323.31	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
<i>Utility discount rate (%):</i>	0.0752										

¹ Expenditures are reported on accrual 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. Only actual expenditures for the year need to be reported.

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

Appendix B - Discussion of the Program

(complete this Appendix for each program)

A. **Name of the Program:** Energy Star Appliance Rebate

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

This program provides a rebate incentive to customers purchasing new 'Energy Star' rated appliances. It is a continuation of the original rebate program which we applied for to assist customers forced to replace appliances after the July 2004 Flood. The program involves the customer completing a form and bringing in the receipt. Customer Service activity involves researching that the appliance qualifies as an Energy Star appliance and applying the rebate to the customer's utility account.

Appliance retailers participated in the program by notifying customers that it was available and by providing forms.

The true benefit of this program will be realized over the 15 year life cycle

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
<i>Base case technology:</i>	Replace old appliance		
<i>Efficient technology:</i>	Energy star appliance		
<i>Number of participants or units delivered for reporting year:</i>	700		
<i>Measure life (years):</i>	15		
<i>Number of Participants or units delivered life to date</i>	1844		

B. TRC Results:	Reporting Year	Life Cycle TRC Results:
¹ TRC Benefits (\$):	\$ 8,990.23	\$ 248,653.71
² TRC Costs (\$):		
<i>Utility program cost (excluding incentives):</i>	\$ 4,315.00	\$ 11,788.05
<i>Incremental Measure Costs (Equipment Costs)</i>	\$ 63,756.00	195,316.00
<i>Total TRC costs:</i>	\$ 68,071.00	\$ 207,104.05
<i>Net TRC (in year CDN \$):</i>	-\$ 59,080.77	\$ 41,549.66
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>	\$ 0.13	1.200622128

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

Conservation Programs:

	Summer		Winter		Cumulative Annual Savings
<i>Demand savings (kW):</i>					
		<i>lifecycle</i>	<i>in year</i>		
<i>Energy saved (kWh):</i>		1,982,044.72	125,064.40		237,170.32
<i>Other resources saved :</i>					
<i>Natural Gas (m3):</i>					
<i>Other (specify):</i>					

Demand Management Programs:

<i>Controlled load (kW)</i>		
<i>Energy shifted On-peak to Mid-peak (kWh):</i>		
<i>Energy shifted On-peak to Off-peak (kWh):</i>		
<i>Energy shifted Mid-peak to Off-peak (kWh):</i>		

Demand Response Programs:

<i>Dispatchable load (kW):</i>		
<i>Peak hours dispatched in year (hours):</i>		

Power Factor Correction Programs:

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

Line Loss Reduction Programs:

Peak load savings (kW):			
	<i>lifecycle</i>	<i>in year</i>	
Energy savngs (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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<u>Actual Program Costs:</u>		<u>Reporting Year</u>	<u>Cumulative Life to Date</u>
D. Utility direct costs (\$):	<i>Incremental capital:</i>	\$ 63,756.00	\$ 167,992.00
	<i>Incremental O&M:</i>	\$ 50.00	\$ 100.00
	<i>Incentive:</i>	\$ 34,979.00	\$ 93,304.00
	<i>Total:</i>	\$ 98,785.00	\$ 261,396.00
Utility indirect costs (\$):	<i>Incremental capital:</i>	\$ 4,224.50	\$ 10,018.10
	<i>Incremental O&M:</i>	\$ 40.50	\$ 81.00
	<i>Total:</i>	\$ 4,265.00	\$ 10,099.10

E. Assumptions & Comments:

Accumulative results calculated from 2004 as we received approval from OEB to run this program prior to C&DM for appliance replacement due to major Peterborough Flood.

¹ 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 numebr of units times the net present value per unit benefit specified in the TRC Guide.

² 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 B - Discussion of the Program

(complete this Appendix for each program)

A. **Name of the Program:** Storage Heating

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

In co-operation with the local social housing authority, the LDC provided financial, technical and administrative assistance to convert 124 electrically heated units from baseboard electric heating to electric thermal storage heating. The non-ducted heaters are designed to heat the room or area into which they are placed. During off-peak hours, heaters convert electricity into heat and store that heat in specially designed high-density ceramic bricks capable of storing vast amounts of heat for extended periods of time. A fan inside the unit circulates this stored heat evenly and quietly as the room thermostat calls for heat.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	Baseboard heating system		
Efficient technology:	Storage heating system		
Number of participants or units delivered for reporting year:	85		
Measure life (years):	18		
Number of Participants or units delivered life to date	124		

	Reporting Year		Life Cycle TRC Results:
¹ TRC Benefits (\$):	\$	16,189.29	\$ 723,979.71
² TRC Costs (\$):			
Utility program cost (excluding incentives):	\$	96,018.00	\$ 152,644.00
Incremental Measure Costs (Equipment Costs)	\$	234,000.00	\$ 372,000.00
Total TRC costs:	\$	330,018.00	\$ 524,644.00
Net TRC (in year CDN \$):	-\$	313,828.71	\$ 199,335.71
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$	0.05	\$ 1.38

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

Conservation Programs:

Demand savings (kW):		Summer		
		Winter		
Energy saved (kWh):	lifecycle	in year		Cumulative Annual Savings
Other resources saved :	4123863.4	224477.2		307751
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):

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lifecycle *in year*

Energy savngs (kWh):

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Distributed Generation and Load Displacement Programs:

Amount of DG installed (kW):

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Energy generated (kWh):

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Peak energy generated (kWh):

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Fuel type:

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Other Programs (specify):

Metric (specify):

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D. Actual Program Costs:

		<u>Reporting Year</u>	<u>Cumulative Life to Date</u>
Utility direct costs (\$):	Incremental capital:	\$ 234,000.00	\$ 372,000.00
	Incremental O&M:	\$ 96,018.00	\$ 152,644.00
	Incentive:		
	Total:	\$ 330,018.00	\$ 524,644.00
Utility indirect costs (\$):	Incremental capital:		
	Incremental O&M:		
	Total:		

E. Assumptions & Comments:

With the availability of Smart Meters and Time of Use rates, the conversion will have a large impact on the reduction of Social Housing and/or the tenant's electrical bill. The annual savings in electricity costs is approximately \$383 per unit or \$47,492 for current 124 units converted. This was calculated by taking a case study of 20 units and comparing the direct cost difference between Time of Use and Price Protected rates as well as the overall shift of consumption to a reduced rate time period. The residential load profile found that with baseboard heat, consumption was Off Peak for 34% of the total consumption. After the conversion to Thermal Storage Electric Heat, the Off Peak consumption increased to 88% with majority of the remaining portion being for Hot Water Tanks. Assuming that carbon fuel, coal, is burnt in peaking generating stations, there will also be a reduction in green house gas production. This initiative has allowed us to extend our past experience with shifting demand from on peak to off peak by using radio control signals through the SCADA program. This initiative was successful in shifting consumption from on peak to off peak in partnership with the local municipality however, in accordance with this initiative has been completed.

¹ 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.
² 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 B - Discussion of the Program

(complete this Appendix for each program)

A. Name of the Program: Public Education

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

Our goal is to promote electrical safety, conservation and demand management through participation in trade shows, home shows and advertisement through various media.

At present the LDC provides a safety program to all of the schools within its service territory. This program has been augmented to provide electricity conservation along with the safety messages

Savings are as recognized in the other initiatives within the CDM portfolio.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	promote electrical safety		
Efficient technology:	promote conservation and demand		
Number of participants or units delivered for reporting year:	25904		
Measure life (years):	3		
Number of Participants or units delivered life to date	50909		

B. TRC Results:	Reporting Year	Life Cycle TRC Results:
¹ TRC Benefits (\$):		
² TRC Costs (\$):	\$ 39,864.99	\$ 72,219.71
Utility program cost (excluding incentives):		
Incremental Measure Costs (Equipment Costs)		
Total TRC costs:	\$ 39,864.99	\$ 72,219.71
Net TRC (in year CDN \$):	-\$ 39,864.99	-\$ 72,219.71
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ -	\$ -

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

Conservation Programs:

	Summer	Winter	Cumulative Annual Savings
Demand savings (kW):			
Energy saved (kWh):	lifecycle	in year	
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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<u>D. Actual Program Costs:</u>		<u>Reporting Year</u>	<u>Cumulative Life to Date</u>
Utility direct costs (\$):	<i>Incremental capital:</i>		
	<i>Incremental O&M:</i>	\$ 39,864.99	\$ 72,219.71
	<i>Incentive:</i>		
	<i>Total:</i>		
Utility indirect costs (\$):	<i>Incremental capital:</i>		
	<i>Incremental O&M:</i>		
	<i>Total:</i>		

E. Assumptions & Comments:

Budget was re-allocated in June of 2006 from \$104,278 to \$78,167.

¹ 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.

² 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 B - Discussion of the Program

(complete this Appendix for each program)

A. **Name of the Program:** Radio Signal Control

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

We have developed a radio signal system that may be used by customers to control appliances and shift discretionary use of electricity to off peak times. The signals are currently provided at no cost to the customer and will automatically disable appliances connected to the in-home controller and enable the appliance at an 'off peak' time. Appliances such as electric water heaters, dishwashers, pool pumps, clothes washers and electric dryers may be controlled, but have a manual override button to permit the customer to use the appliance during a control period if necessary.

Measure(s):

	Measure 1 - Controllers	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	Appliance Consumption not controlled		
Efficient technology:	Appliance consumption controlled		
Number of participants or units delivered for reporting year:	124		
Measure life (years):	12		
Number of Participants or units delivered life to date	126		

B. TRC Results:	Reporting Year	Life Cycle TRC Results:
¹ TRC Benefits (\$):	\$ 17,687.75	\$ 1,030,572.13
² TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ 29,016.00	50,544.00
Incremental Measure Costs (Equipment Costs)	\$ 72,832.00	113,800.00
Total TRC costs:	\$ 101,848.00	164,344.00
Net TRC (in year CDN \$):	-\$ 84,160.25	\$ 866,228.13
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	0.17	6.270822999

C. Results: (one or more category may apply)	Cumulative Results:	
Conservation Programs:		
Demand savings (kW):	Summer	
	Winter	
	lifecycle	Cumulative Annual Savings
Energy saved (kWh):	in year	
Other resources saved :		
Natural Gas (m3):		
Other (specify):		
Demand Management Programs:		
Controlled load (kW)	96.348	2012
Energy shifted On-peak to Mid-peak (kWh):	367040	7666400
Energy shifted On-peak to Off-peak (kWh):	52700	1100750
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 savngs (kWh):		
Distributed Generation and Load Displacement Programs:		
Amount of DG installed (kW):		
Energy generated (kWh):		
Peak energy generated (kWh):		

Fuel type:

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Other Programs (specify):

Metric (specify):

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D. Actual Program Costs:

		Reporting Year		Cumulative Life to Date	
Utility direct costs (\$):	Incremental capital:	\$	35,072.00	\$	36,168.00
	Incremental O&M:	\$	37,760.00	\$	38,940.00
	Incentive:				
	Total:	\$	72,832.00	\$	75,108.00
Utility indirect costs (\$):	Incremental capital:				
	Incremental O&M:		29,016.00	\$	29,640.00
	Total:		29,016.00	\$	29,640.00

E. Assumptions & Comments:

Budget was re-allocated in June of 2006 from \$282,000 to \$165,698. As with 2005 report, The benefits of this program used the TRC Assumptions and Measures List for the control of the water heater. These measures were then extrapolated to the control of appliances based on the Base Annual Energy Usage of the water heater versus the appliances. The benefits include kWh savings and on peak summer demand savings. Assuming that carbon fuel, ie coal, is burnt in peaking generating stations, there will be a reduction in greenhouse gas production as a result of this initiative.

This initiative has been successful because of the availability of Smart Meter technology and Time of Use rates.

Current cost of energy is 3.4 cents per Kilowatt-hour 'Off Peak', 9.7 cents per kilowatt-hour 'On Peak' and 7.1 cents per kilowatt-hour 'Mid Peak'

¹ 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.

² Total budget was re-allocated in June of 2006 from \$260,000 to \$165,698 for this program. As with 2005 report, The benefits of this program used the TRC Assumptions and Measures List for the control of the water heater. These measures were then extrapolated.

Appendix B - Discussion of the Program

(complete this Appendix for each program)

A. Name of the Program: Load Monitor

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

The LDC provides the loan of load monitors to customers who use them to measure how much energy is being used by various appliances and devices within their home or business. Customers are asked to complete a form providing information on which appliance(s) they monitored and what action they expect to take to reduce consumption or demand.

This is an educational tool intended to help customers be more prudent with their hydro consumption.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	n/a		
Efficient technology:	Load Monitor		
Number of participants or units delivered for reporting year:	298		
Measure life (years):	15		
Number of Participants or units delivered life to date	522		

	Reporting Year	Life Cycle TRC Results:
¹ TRC Benefits (\$):	\$ 1,256.47	\$ 39,173.83
² TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ 2,346.75	\$ 10,246.40
Incremental Measure Costs (Equipment Costs)	\$ 7,524.50	\$ 32,318.43
Total TRC costs:	\$ 9,871.25	\$ 42,564.83
Net TRC (in year CDN \$):	-\$ 8,614.78	-\$ 3,391.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ 0.13	\$ 0.92

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

Conservation Programs:

	Summer	Winter	Cumulative Annual Savings
Demand savings (kW):			
Energy saved (kWh):	lifecycle 267,457.00	in year 17,478.88	22,752.68
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):

D. <u>Actual Program Costs:</u>		<u>Reporting Year</u>	<u>Cumulative Life to Date</u>
<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i>	\$ 7,524.50	\$ 22,293.17
	<i>Incremental O&M:</i>	\$ -	\$ -
	<i>Incentive:</i>		
	<i>Total:</i>	\$ 7,524.50	\$ 22,293.17
<i>Utility indirect costs (\$):</i>	<i>Incremental capital:</i>		
	<i>Incremental O&M:</i>	2,346.75	\$ 7,593.20
	<i>Total:</i>	2,346.75	\$ 7,593.20

E. Assumptions & Comments:

Budget was re-allocated in June of 2006 from \$17,000 to \$13,986.

¹ 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.

² 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 B - Discussion of the Program

(complete this Appendix for each program)

A. Name of the Program: Lighting for Social Housing

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

The project consist of replacing incandescent light bulbs in 1688 Social Housing units with approximately 25,320 compact fluorescent light bulbs (CFL). The lighting program brings many benefits to the City of Peterborough, the tenants of Social Housing, and Peterborough Distribution Inc. These include Energy reduction (kWh), environmental savings (GHG), cost savings for tenants, local employment, reduced bulb replacement (5 year life expectancy 8000 hours), and recycling of incandescent bulbs.

Measure(s):	Bulbs	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	Incandescent light bulbs			
Efficient technology:	Compact florescent light bulbs			
Number of participants or units delivered for reporting year:		0		
Measure life (years):		4		
Number of Participants or units delivered life to date		0		

B. TRC Results:	Reporting Year	Life Cycle TRC Results:
¹ TRC Benefits (\$):	\$ -	\$ 939,205.38
² TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ -	-
Incremental Measure Costs (Equipment Costs)	\$ 65,995.19	65,995.19
Total TRC costs:	\$ 65,995.19	\$ 65,995.19
Net TRC (in year CDN \$):	-\$ 65,995.19	\$ 873,210.19
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ -	\$ 14.23

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

Conservation Programs:		Summer	Winter	Cumulative Annual Savings
Demand savings (kW):				
Energy saved (kWh):	lifecycle 11983449.6	in year		
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 begining 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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D. <u>Actual Program Costs:</u>		<u>Reporting Year</u>	<u>Cumulative Life to Date</u>
Utility direct costs (\$):	<i>Incremental capital:</i>	\$ 60,768.00	\$ 60,768.00
	<i>Incremental O&M:</i>	\$ 5,227.19	\$ 5,227.19
	<i>Incentive:</i>		
	<i>Total:</i>	\$ 65,995.19	\$ 65,995.19
Utility indirect costs (\$):	<i>Incremental capital:</i>		
	<i>Incremental O&M:</i>		
	<i>Total:</i>		

E. Assumptions & Comments:

Assumptions:

§ Incandescent bulb 100W x 5,064 = 506,400W or	506 kW
§ Incandescent bulb 60W x 20,256 = 1,215,360W or	1215 kW
§ Total Incandescent = 1,721,760W or	1722 kW
§ CFL bulbs 23W x 5,064 = 116,472W or	116 kW
§ CFL bulbs 15W x 20,256 = 303,840W or	304 kW
§ Total CFL = 455,634W or	456 kW
§ Savings (1,721,760-455,634) = 1,266,126W or	1266 kW
§ Daily (1266 kW x 6 hours per day) =	596 kWh
§ Annual (7596 kWh x 365 days) =	2,772,540 kWh
§ Total kWh savings (2,772,540 x 5 year life) =	13,862,700 kWh
§ 5 year cost savings @ .10 per kWh x 13,862,700 =	\$ 1,386,270

¹ 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.

² 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 B - Discussion of the Program

(complete this Appendix for each program)

A. **Name of the Program:** Cool Shops

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

The original proposal was to develop an EnerGuide for Small Business, however, once the Cool Shops program became available, it was more efficient to join with other cities in this joint service offering. Cool Shops tried a different approach to engaging the small commercial sector in order to make it easier for businesses to participate and undergo energy efficient changes. Throughout program implementation in Peterborough, Street Teams visited all small commercial areas within the City as well as the outlying communities of Norwood and Lakefield. The Street Teams provided assistance to businesses that exchanged inefficient light fixtures or bulbs to energy efficient versions. This initiative is successful because it provides business owners with the assistance and encouragement to invest in energy conservation.

Measure(s):

	Measure 1- Fluorescent	Measure 2 - CFL	Measure 3 - Customers
<i>Base case technology:</i>	inefficient light fixtures/bulbs	inefficient light fixtures/bulbs	
<i>Efficient technology:</i>	efficient light fixtures/bulbs	efficient light fixtures/bulbs	
<i>Number of participants or units delivered for reporting year:</i>	0	0	
<i>Measure life (years):</i>	5	2	
<i>Number of Participants or units delivered life to date</i>	2325	1308	169

B. TRC Results:	Reporting Year	Life Cycle TRC Results:
¹ TRC Benefits (\$):		\$ 285,356.62
² TRC Costs (\$):		
<i>Utility program cost (excluding incentives):</i>		\$ 30,104.00
<i>Incremental Measure Costs (Equipment Costs)</i>	\$ -	131,736.00
<i>Total TRC costs:</i>		\$ 161,840.00
<i>Net TRC (in year CDN \$):</i>		123,516.62
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>		1.763202038

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

Conservation Programs:

	<i>Summer</i>		Cumulative Annual Savings
	<i>Winter</i>	<i>lifecycle</i>	
<i>Demand savings (kW):</i>			
<i>Energy saved (kWh):</i>		2,923,724.80	1,440,716.80
<i>Other resources saved :</i>			
<i>Natural Gas (m3):</i>			
<i>Other (specify):</i>			

Demand Management Programs:

<i>Controlled load (kW)</i>		
<i>Energy shifted On-peak to Mid-peak (kWh):</i>		
<i>Energy shifted On-peak to Off-peak (kWh):</i>		
<i>Energy shifted Mid-peak to Off-peak (kWh):</i>		

Demand Response Programs:

<i>Dispatchable load (kW):</i>		
<i>Peak hours dispatched in year (hours):</i>		

Power Factor Correction Programs:

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

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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<u>D. Actual Program Costs:</u>		<u>Reporting Year</u>	<u>Cumulative Life to Date</u>
Utility direct costs (\$):	Incremental capital:		\$ -
	Incremental O&M:		\$ 30,104.00
	Incentive:		
	Total:	\$ -	\$ 30,104.00
Utility indirect costs (\$):	Incremental capital:		
	Incremental O&M:		
	Total:	0	

E. Assumptions & Comments:

Based on the Ontario Energy Board calculation model, the Total Resource Cost Guide (TRC), we anticipate energy savings of 2,923,725 kWh over the 2 or 5-year life cycle of the new bulbs.

The final Cool Shops Report indicated that Businesses saved a total of \$3,600 per year as a result of the free CFL installation and the purchase of discounted energy efficient products.

The 2005 annual report indicated TRC Benefit and Expense as totals for entire budget over life cycle. Budget was re-allocated in June of 2006 from \$50,000 to \$30,104. As this initiative was completed in 2005, TRC results now reflect only total to date (cumulative).

¹ 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.

² 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 B - Discussion of the Program

(complete this Appendix for each program)

A. **Name of the Program:** Infra-Red Camera

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

The LDC purchased an infra-red camera. In co-operation with Peterborough Green Up, building audits were to have been performed at the customer's request. Peterborough Green Up was to conduct its audit with the intent of reducing consumption of electricity and other environmental considerations. The building owner could then take remedial measures on the building. This service was to have been available to all electricity customers, however, Peterborough Green Up has indicated that it does not have the resources to be able to continue with this initiative. The camera will, however, be used by the Distribution Company to scan the electric distribution lines within the LDC to detect places where conductors and transformers are abnormally hot and thereby reduce losses in the electric distribution system.

Measure(s):

	Measure 1	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			

	<u>Reporting Year</u>	<u>Life Cycle TRC Results:</u>
B. <u>TRC Results:</u>		
¹ TRC Benefits (\$):	\$ -	0
² TRC Costs (\$):		
Utility program cost (excluding incentives):		\$ 82,985.13
Incremental Measure Costs (Equipment Costs)	\$ -	
Total TRC costs:	\$ -	\$ 82,985.13
Net TRC (in year CDN \$):	-\$	82,985.13
Benefit to Cost Ratio (TRC Benefits/TRC Costs):		

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

Conservation Programs:

Demand savings (kW):	Summer			Cumulative Annual Savings
	Winter			
	lifecycle	in year		
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):		
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 savngs (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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<u>Actual Program Costs:</u>		<u>Reporting Year</u>	<u>Cumulative Life to Date</u>
Utility direct costs (\$):	Incremental capital:		\$ 63,720.00
	Incremental O&M:		\$ 18,665.13
	Incentive:		
	Total:		\$ 82,385.13
Utility indirect costs (\$):	Incremental capital:		
	Incremental O&M:		\$ 600.00
	Total:		\$ 600.00

E. Assumptions & Comments:

Budget was re-allocated in June of 2006 from \$95,000 to \$82,385.

- ¹ 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.
- ² 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.