



**2006 Annual Report, Third Tranche Funding,
Halton Hills Hydro**

RP-2004-0203\EB-2005-0374

Submitted: March 30, 2007



Table of Contents

	<u>Page</u>
1. Introduction	1
1.1. Discount Rate	1
2. Evaluation of the CDM Plan	1
2.1. TRC Results at the Portfolio Level	1
3. Discussion of Programs	2
3.1. Residential	3
3.1.1. Customer Conservation Education	3
3.1.2. Customer Coupons – Spring EKC	4
3.1.3. Customer Coupons – Fall EKC	5
3.1.4. Customer Coupons – Appliance Survey	5
3.1.5. ENERconnect Coupon Program	6
3.1.6. Water Heater Load Control	6
3.2. Commercial	7
3.2.1. Customer Conservation Education	7
3.2.2. Commercial Industrial Audits	7
3.2.3. System Loss Reduction – Municipal Lighting Retrofits	8
3.2.4. System Loss Reduction – Boiler Upgrade	9
3.2.5. System Loss Reduction – Transformer Upgrades	9
3.2.6. Load Shifting – ZEBRA Battery Pilot	10
3.3. Smart Metering	11
3.4. Adjustments to 2006 Expenditures	12
4. Lessons Learned	12
4.1. Residential	12
4.2. Commercial	13
4.2.1. ZEBRA Battery Pilot	13
5. Conclusion	14



Table of Contents

(continued)

	<u>Page</u>
6. Appendices	15
6.1. Appendix A: Evaluation of the HHH 2006 CDM Plan	15
6.2. Appendix B: Discussion of the Programs	16
6.2.1. Residential	16
6.2.1.1. Residential Customer Conservation Education	16
6.2.1.2. Customer Coupons – Spring EKC	18
6.2.1.3. Customer Coupons – Fall EKC	20
6.2.1.4. Customer Coupons – Appliance Survey	22
6.2.1.5. ENERconnect Coupon Program	24
6.2.1.6. Water Heater Load Control	26
6.2.2. Commercial	28
6.2.2.1. Commercial Customer Conservation Education	28
6.2.2.2. Commercial Industrial Audits	30
6.2.2.3. System Loss Reduction – Municipal Lighting Retrofits	32
6.2.2.4. System Loss Reduction – Boiler Upgrade	34
6.2.2.5. System Loss Reduction – Transformer Upgrades	36
6.2.2.6. Load Shifting – ZEBRA Battery Pilot	38
6.2.3. Smart Metering	40
6.3. Appendix C: HHH Program and Portfolio Totals	42
6.4. Appendix D: Load Shifting Photo & July 11, 2006 Toronto Star Article	49



1. Introduction

HHH developed a multi-pronged plan for CDM that expected energy savings from residential, commercial and industrial customer classes as well as from HHH's system operations. Halton Hills Hydro (HHH) submitted our Demand Side Management Program on December 7, 2004. Education was given a priority in HHH's CDM plan in order to encourage and foster a conservation culture among customers.

With the majority of the customer base being residential historically, HHH expects a significant impact to the utility as new commercial/industrial properties move into Halton Hills. Finding innovative solutions to the new demands that will be placed on HHH's distribution system will be key.

The learning around the cost effectiveness of various energy conservation and demand management initiatives will assist HHH in achieving our goal of a 5% reduction in energy usage.

1.1. Discount Rate

The discount rate used in all the Net Present Value (NPV) calculations used in the TRC analysis is 7.94%. This discount rate was determined using 50% of the rate of return and 50% of the debt rate for 2006. This level of discount rate ensures that there will be no change to the 50:50 ratio of debt to equity required of HHH.

2. Evaluation of the CDM Plan

HHH's CDM Plan was evaluated by following the OEB Total Resource Cost (TRC) Guide of October 14, 2005 as updated. A TRC analysis was done for each initiative and then the results for each initiative was summarized in the required formats for Appendices A, B and C. These Appendices have been provided in Sections 6.1, 6.2 and 6.3, respectively.

2.1. 2006 TRC Results at the Portfolio Level

Overall TRC results at the Portfolio level have been provided in Appendix A, attached as Section 6.1 to this report.

The Chief Energy Conservation Officer's 2005 Annual Report states on page 6 that the government is "...moving to a sophisticated system of smart meters where electricity consumers can monitor their consumption and shift some of their electricity use to off-peak hours." The HHH Load Shifting pilot is complimentary to this plan in that the



storage of low priced off-peak supply for re-delivery during peak periods reduces the system requirements for loads that cannot be switched to off-peak. In addition, the letter from the Minister of Energy to local distribution companies (LDCs) dated May 31, 2004 sets out the eligible CDM initiatives to include distributed energy options behind a customer's meter such as tri-generation, co-generation, ground heat pumps, solar, wind and biomass systems. Particularly for solar and wind, energy storage initiatives such as the new battery technology demonstrated in the Load Shifting pilot is a critical component to ensure high levels of reliability. Load management measures that facilitate interruptible and dispatchable loads, dual fuel applications, thermal storage and demand response are also noted as eligible initiatives.

Therefore during 2006, HHH decided to use a portion of the CDM funds to complete a pilot to test an innovative new battery technology to see if it could be used to store electricity off-peak and discharge the electricity during peak periods on an automated basis. The pilot is discussed more completely in Section 3.2.6, however the total cost of the pilot was \$509,468. HHH contributed \$175,000 of CDM funding toward this new technology development pilot and the remaining amounts were provided by agencies interested in investigating this new technology including the LDC Tomorrow Fund, the OPA Technology Fund and Scientific Research and Experimental Development. Based on the urgent peak reduction needs of the Ontario electricity market that can also be addressed through load shifting strategies and the very positive environmental record of the ZEBRA battery technology, HHH supports undertaking additional pilots as discussed in Section 4.2.1.

The overall portfolio TRC Benefit to Cost ratio for all of HHH's CDM initiatives for 2006 is 1.05 including Net TRC Benefits of \$37,739. For comparison purposes, HHH has also evaluated the portfolio excluding the Load Shifting pilot and found the TRC Benefit to Cost ratio for 2006 excluding the Load Shifting pilot would have been 3.4 including Net TRC Benefits of \$524,189 and the life to date results would have resulted in a TRC Benefit to Cost ratio of 2.4 with Net TRC Benefits of \$639,029.

In this annual report, the CDM expenditures for 2006 are less than reported in the fourth quarter 2006 report by \$56,456 in order to account for an adjustment made to the 2005 data for the ENERconnect Coupon program of \$6,546 as noted in Section 3.1.5 and to remove the CDM expenditure of \$50,000 related to the Transformer Upgrades as noted in Section 3.2.5.

3. Discussions of Programs

An overview of HHH's 2006 CDM initiatives has been provided below along with the associated CDM Budget expenditures and TRC Results. A summary of the TRC results by initiative can also be found in Sections 6.2, Appendix B – Discussion of the Program



and 6.3, Appendix C – Program and Portfolio Totals. An overview of each initiative including a description of the actions taken has been provided below.

3.1. Residential

3.1.1. Residential Customer Conservation Education

Overview

The Residential Customer Conservation Education program has the primary role of encouraging a conservation culture in HHH's customer base. During 2006, several educational initiatives were funded by HHH including the Halton Learning Foundation's energy conservation program for Halton schools and the Halton Energy Drill for reducing peak requirements at Halton regional sites during critical periods. The external costs incurred for CDM reporting have also been included in Residential Customer Conservation and Education.

There are three adjustments required to properly allocate the 2006 CDM expenditures reported electronically and these adjustments will be completed in the first quarter of 2007. The first adjustment is to move \$1,100 from Customer Conservation Education into Load Shifting. The second adjustment is to move \$1,625 from System Loss Reductions into Customer Conservation Education. Finally, the 2006 CDM expenditures for the ENERconnect Coupon program were reduced by \$6,525 to account for the increased expenditures reported in 2005 as noted in Section 3.1.5 below. All three adjustments are also noted in Section 3.4, Adjustments to 2006 Expenditures.

CDM Budget Expenditures

During 2006, HHH spent \$20,996 on Residential Customer Conservation Education initiatives after the adjustments noted above.

The Halton Learning Foundation received a payment of \$4,356. The foundation works with over 76,000 students and in collaboration with other regional, municipal, conservation and environmental organizations aims to significantly reduce the use of electrical energy throughout the region by a minimum of 6% to match the Kyoto Protocol. With the addition of smart meters and continued advances in Building Automation Systems, the foundation is able to have an even greater impact in reducing electricity consumption and be able to measure that impact more accurately and more quickly. The program incorporates a comprehensive and effective array of resources and training involving school board staff from the Facilities and Curriculum



departments as well as the environmental Management Team representing all employee groups and students.

Conservation Halton and Milton Hydro distribution made a partnership agreement to implement the Energy Drill Program across all of Conservation Halton's facilities. HHH spent \$1,625 towards this program. The outcome will be a Conservation Halton-wide, behavioural response triggered by high wholesale market electricity prices or smog alerts, demonstrating that awareness of energy use, coupled with a well thought out action plan can have a significant impact on use of energy and air quality in the community. The program will include site assessments of all facilities, workshops and seminars, site action cards, training of "Energy Marshals", integration in the smog alert program and report cards on performance. The program will result in lower energy usage, a reduction in peak demand and lower emissions. In addition, the program will support a conservation culture and demonstrate leadership in this area.

The 2006 CDM reporting costs totaled \$15,015.

TRC Results

There were no TRC Benefits associated with this initiative in 2006, so only the costs have been reported.

3.1.2. Customer Coupons – Spring EKC

Overview

In the spring of 2006, the Ontario Power Authority (OPA) initiated a residential coupon program across Ontario with the assistance of local electricity distribution companies. The program was called Every Kilowatt Counts (EKC) and included coupons to be redeemed at local hardware and other retailers for compact fluorescent lights (CFLs), ceiling fans, timers and programmable thermostats. HHH has included our results from the Spring EKC program even though there were no third tranche CDM expenditures since this program replaced the ENERconnect Coupon program that HHH participated in during 2005 using CDM funding.

Description of Actions Taken

There were no CDM funds spent for this program. HHH used the results and TRC information provided by SeeLine but adjusted the data for two items. The discount rate was changed to match the HHH 2006 discount rate of 7.94%. Also, the program costs were prorated so that only those costs attributed to HHH's coupon redemption level (\$9,470) were included rather than using the total program costs for the whole province.



TRC Results

The Spring EKC initiative shows a TRC Benefit to Cost ratio for 2006 of 3.91 and Net TRC Benefits of \$53,782.

3.1.3. Customer Coupons – Fall EKC

Overview

In the fall of 2006, the OPA continued the EKC program with another residential coupon offering across Ontario. The second coupon offering included coupons to be redeemed at local hardware and other retailers for compact fluorescent lights (CFLs), seasonal LED lights (SLEDs), programmable thermostats, baseboard programmable thermostats, dimmers and motion sensors for light switches. Like with the Spring EKC initiative, HHH has included our results from the Fall EKC program even though there were no third tranche CDM expenditures since this program replaced the ENERconnect Coupon program that HHH participated in during 2005 using CDM funding.

Description of Actions Taken

There were no CDM funds spent for this program. HHH used the results and TRC information provided by SeeLine but adjusted the data for three items. The discount rate was changed to match the HHH 2006 discount rate of 7.94%. Also, the program costs were prorated so that only those costs attributed to HHH's coupon redemption level (\$11,998) were included rather than using the total program costs for the whole province. Finally, the TRC Benefit to Cost ratio was adjusted to include incremental equipment costs as well as program costs.

TRC Results

The Fall EKC initiative shows a TRC Benefit to Cost ratio for 2006 of 5.76 and Net TRC Benefits of \$115,438.

3.1.4. Customer Coupons – Appliance Survey

Overview

In 2006, the program involved giving CFLs to customers visiting Home Hardware stores in exchange for the completion of a survey on appliance use. HHH undertook this survey to better understand residential customer needs in terms of possible residential appliance programs for the future.



Description of Actions Taken

In 2006, a total of \$5,660 was spent on this program. A total of 660 CFLs were given away through Home Hardware in conjunction with the completion of an appliance survey. Total costs for this initiative included \$1,737 for CFLs and \$3,923 for advertisements in two local newspapers - the Independent & Free Press and the New Tanner.

TRC Results

The Appliance Survey had positive TRC results with a TRC Benefit to Cost ratio of 2.81 and Net TRC Benefits of \$9,267.

3.1.5. ENERconnect Coupon Program

There were costs included in 2006 related to the 2005 ENERconnect coupon program including a charge of \$5,885 that was more than offset by the increase in 2005 expenditures reported in 2005 of \$6,456. The net amount of -\$571 has been reported for 2006. The total HHH CDM expenditures for 2006 are less than the fourth quarter 2006 report by this \$6,456.

3.1.6. Water Heater Load Control

Overview

The HHH Water Heater Load Control (WHLC) program is implemented on new water heaters as well as replacement water heaters. The percentage of replacement installations is assumed to be 88% while the remaining 12% are new water heater installations. These are the actual replacement and new water heater installation rates for the combined period of 2004 and 2005. HHH has assumed an increase in efficiency on the replacement water heaters of 15% due to the decline in efficiency of water heaters as they age. A 10% Free Ridership rate is assumed in the energy saving calculation but a 0% Free Ridership rate is used for the Avoided Capacity Costs for Demand Response since the residential customers would not choose to have a control mechanism installed in the absence of this program.

Description of Actions Taken

Total 2006 expenditures on the Water Heater Load Control program were \$37,014 and 132 water heater controls were installed. Annual kWh savings for the water heaters installed during 2006 were 58,080 and the peak reduction for the water heater controls totaled 110 kW.



2006 TRC Results

The water heater load control initiative had a TRC Benefit to Cost ratio of 4.03 for the 2006 year and Net TRC Benefits of \$125,056.

3.2. Commercial

3.2.1. Commercial Customer Conservation Education

Overview

Like its Residential equivalent, the Commercial Customer Conservation Education initiatives have the primary role of encouraging a conservation culture in HHH's customer base. During 2006, several educational initiatives were funded by HHH including the continuation of the Enerconnect e-meter program and an Energy Newsletter for commercial customers.

Description of Actions Taken

Total 2006 expenditures were \$17,850. The Enerconnect e-meter program where commercial and industrial customers can view their consumption and billing history as well as wholesale market pricing information and electricity news on-line was continued at a cost of \$12,850 and an energy newsletter for HHH's commercial and industrial customers was provided at a cost of \$5,000.

TRC Results

There were no TRC Benefits associated with this initiative in 2006, as it is an educational program, so only the costs have been reported.

3.2.2. Commercial Industrial Audits

Overview

During 2005, HHH provided financial support to the Town of Halton Hills for the installation of demand side reduction equipment at the Mold-Masters SportsPlex in Georgetown.



Description of Actions Taken

This program was completed in 2005. However, there was a refund from Powerwise of \$5,629 from the costs reported in 2005 to reflect the difference between the expected and actual costs of an inverter installation in the Mold-Masters SportsPlex. This refund was received and reported during 2006.

TRC Results

There was no TRC completed for this initiative since the costs related to the 2005 initiative.

3.2.3. System Loss Reduction – Municipal Lighting Retrofits

Overview

HHH funded lighting retrofits at four municipal sites in the Town of Halton Hills. These included the Acton Indoor Pool, the Robert C Austin Public Works Facility, the Prospect Park Pavilion and the Cedarville Daycare Centre.

Description of Actions Taken

The total cost of the retrofits was \$14,311 for a total of 309 light replacements. Although there were various lighting technologies being replaced and most did not have exact equivalents in the TRC measurements list, the majority of the existing lights were similar to the 4-bulb T8 (34W) 156W technology and these were being replaced with a Low Watt electronic ballast and 25W T8 fluorescent lighting. As a check for using this assumption, the average existing light fixture was calculated to be a 151W fluorescent light. Therefore, the energy savings pattern of the equipment shown for the 4-bulb T8 (34W) 156W technology was used to distribute the project's energy savings. The project's energy savings was determined using actual usage patterns for each light fixture being upgraded. The average life was calculated as 5 years which also corresponds with the life of the 4-bulb T8 (34W) 156W technology.

TRC Results

The TRC Benefit to Cost ratio for the Municipal Lighting Retrofits for 2006 is 1.74 and Net TRC Benefits of \$9,914.



3.2.4. System Loss Reduction – Boiler Upgrade

Overview

HHH converted the electric powered HVAC system for our head office to gas powered heating, air conditioning and make-up air units. This change displaced all electricity consumption for the old units.

Description of Actions Taken

HHH spent a total of \$99,748 for the conversion resulting in the displacement of 421,943 kWh of electricity consumption.

TRC Results

The 2006 TRC Benefit to Cost ratio for this conversion is 4.06 and Net TRC Benefits of \$274,436.

3.2.5. System Loss Reduction – Transformer Upgrades

Overview

The purpose of this initiative was to complete infrastructure improvements using CDM funds in order to generate energy savings for our customers.

Description of Actions Taken

HHH reported expenditures of \$50,000 for transformer upgrades in 2006. Following a review of the TRC costs, HHH has decided to remove this expenditure from their 2006 CDM expenditures and an adjustment will be made in the first quarter of 2007 to reflect this change.

TRC Results

There was no TRC analysis completed since this is an adjustment to remove funds from CDM expenditures.



3.2.6. Load Shifting – ZEBRA Battery Pilot

Overview

As described in Section 2.1, Ontario needs to develop technologies that reduce the peak requirements or help to shift load requirements to off-peak periods. In response to this need, HHH investigated the use of automated technology to shift load requirements to off-peak using batteries. The ZEBRA (zero-emission battery research activity) batteries have a sodium-nickel-chloride composition which makes them non-hazardous, non-corrosive, safe to operate, relatively quick to charge and discharge and tolerant to temperature extremes. Once spent, these batteries can be recycled in steel making furnaces where they are melted, and used as raw material for new nickel, chrome and iron. Copper is reclaimed from the melt and sold, while the remaining materials, including ceramics and sales are used for road construction materials.

This pilot project aims to store electricity and discharge it during times of peak demand. Based on technology that uses advanced sodium-nickel-chloride batteries that are charged during off-peak hours when electricity demand and prices are low. The batteries are then discharged during the day, when demand and prices for power are high. The system is connected to software that will continuously calculate the best and most cost-efficient times to charge and discharge the battery units in future. A photo of the installation has been provided in Appendix D.

This prototype projects uses only five batteries with a total output of 100 kilowatt hours but could be scaled up to multiple megawatt hours. Local distributors can use the energy storage capabilities to purchase lower-cost power over night and deliver it to our customers during peak hours when the price is high. Generators, including wind and solar, could help smooth our delivery to the market by storing the energy produced during off-peak hours until the next peak cycle. Across all sectors, energy could also be stored to be available for emergencies removing the need to rely on small back-up diesel generators.

The ZEBRA battery is extremely efficient delivering over 90% of the stored energy as output, depending on how the battery is being used. The cycle life is better than 1,000 cycles. The battery is tolerant of short circuits and typical cell failure is a short circuit that does not cause a complete failure of the battery due to the independent nature of the 216 cells in each battery. This battery is safer than sodium sulfur cells and made of low cost material.

In addition to HHH CDM support, this pilot project has received funding from the LDC Tomorrow Fund, the OPA Technology Fund and Scientific Research and Experimental Development. With the assistance of all of these funding partners, HHH is exploring



the economic feasibility of reducing Ontario's peak load through the use of battery technology. The Electric Power Research Institute based in Palo Alto, California is also planning to investigate the use of this technology for responding to solely economic triggers to charge and discharge the batteries.

Description of Actions Taken

Five 20 kW batteries were installed during 2006 at a total cost of \$509,468. CDM expenditures accounted for \$175,000 of this cost. During this first stage of the project, the system was tested to ensure that it worked according to expectations. The battery system has performed well with the batteries achieving 98% efficiency and the overall system an efficiency of 78%. The next stage will involve using the system technology to follow the prices during the day to determine the best times to charge and discharge the batteries in order to achieve the optimum cost savings. This is a pilot program and there were no OEB measures applicable. The difference between the cost to charge the batteries and the price obtained from discharging the batteries results in an average daily saving of \$172 based on the actual HOEP prices for the period Jan 1, 2006 to Feb 28, 2007. This savings was included in the NPV TRC Benefits. The kW reduction was included at a conservative level of 19 kW and the Free Rider rate used was 0%.

2006 TRC Results

As a pilot project testing leading edge technology, the costs of this unique project are higher than they will be in the future when this technology reaches some economies of scale. The TRC Benefit to Cost ratio was 0.05 in 2006. Given the interest by our funding partners in this leading edge technology and the experience gained from this first pilot, HHH expects the next few projects to improve on this performance. Based on the urgent peak reduction needs of the Ontario electricity market that can also be addressed through load shifting and the very positive environmental record of this technology, HHH supports undertaking additional pilots even if the TRC Benefit to Cost ratio is less than 1.0 in these early development stages.

3.3. Smart Metering

Overview

In 2006, HHH undertook research and development activities related to smart metering that was funded through CDM.



Description of Actions Taken

A technical communications study was undertaken at a cost of \$6,000. Testing of new technologies and combinations to technologies was performed at a cost of \$13,000. Staff time was spent on site visits to other LDCs at cost of \$5,479. The total expenditures in this area are \$24,479. No additional work or expenditures are planned in CDM Smart Metering since the remaining activities will occur through non-CDM Smart Meter funding.

TRC Results

There were no TRC Benefits associated with this initiative in 2006, so only the costs have been reported.

3.4. Adjustments to 2006 Expenditures

There are three adjustments required to properly allocate the 2006 CDM expenditures reported electronically and these adjustments will be completed in the first quarter of 2007. The first adjustment is to move \$1,100 from Customer Conservation Education into Load Shifting. The second adjustment is to move \$1,625 from System Loss Reductions into Customer Conservation Education. The final adjustment required is to remove \$50,000 from System Loss Reduction as noted in Section 3.2.5.

Also, as noted in Section 3.1.5, HHH reported an extra \$6,456 of costs in the 2005 report for the ENERconnect Coupon program. This adjustment was made in the annual CDM report to account for costs that had not yet been invoiced. In 2006, the actual cost was reported as \$5,885 for a net difference of -\$571. This adjustment was made in Appendices A, B, and C and does not require an adjustment to the 2006 CDM expenditures already reported to the OEB.

4. Lessons Learned

4.1. Residential

There were benefits of using a province-wide program sponsored by the OPA for the spring and fall coupon programs. The Spring Every Kilowatt Counts (EKC) initiative shows a TRC Benefit to Cost ratio of 3.91 and the Fall EKC initiative shows a TRC Benefit to Cost ratio of 5.76. In addition, the Appliance Survey Customer Coupon



program had a TRC Benefit to Cost ratio of 2.81. It is clear that these coupon programs are effective and should be continued in the future.

4.2. Commercial

HHH converted the electric powered HVAC system for our head office to gas powered heating, air conditioning and make-up air units. Since this change displaced all electricity consumption for the old units, there were significant Net TRC Benefits. Other opportunities to convert HVAC systems to alternate fuels will be evaluated as they are identified.

4.2.1. ZEBRA Battery Pilot

The results for 2006 supported the ability of the ZEBRA battery pilot to use an automated system to charge and discharge the batteries. HHH is currently calculating the benefits if the batteries are discharged during peak pricing periods rather than using static rules. The next steps will be to demonstrate the ability of the system to control the charge and discharge periods based on the Ontario system needs as defined by the 3-hour ahead pre-dispatch price.

In addition, HHH learned that the batteries could be scaled up to use five batteries instead of only one using “off-the-shelf” technologies. Future pilots will be needed to demonstrate the ability to scale the system to larger capabilities such as 1 MW.

Finally, HHH learned that there is significant interest in this technology internationally and that HHH, Ontario and Canada have an opportunity to develop this potentially world class, leading edge technology. For example, the Electric Power Research Institute (EPRI) mentioned in Section 3.2.6, has major locations in Palo Alto, California; Charlotte, North Carolina; and Knoxville, Tennessee, was established in 1973 as an independent, nonprofit center for public interest energy and environmental research. EPRI brings together members, participants, the Institute's scientists and engineers, and other leading experts to work collaboratively on solutions to the challenges of electric power. These solutions span nearly every area of electricity generation, delivery, and use, including health, safety, and environment. EPRI's members represent over 90% of the electricity generated in the United States. International participation represents nearly 15% of EPRI's total research, development, and demonstration program.



5. Conclusion

In 2006, the actual expenditures since program inception compared to budget have been shown in Table 1 below. As of the end of 2006, 81.8% of the total budget has been spent on CDM initiatives.

Table 1: CDM Budget and Expenditures – 2006 Life-to-Date

Program	Budget Amount	Expenditures to Dec 31 2006
Load Shifting	\$200,000	\$175,000
Smart Metering	\$50,000	\$24,479
System Loss Reduction	\$275,000	\$169,961
Water Heater Load Control	\$80,000	\$89,056
C/I Energy Audits	\$90,000	\$48,648
Customer Education	\$20,000	\$77,496
TOTAL	\$715,000	\$584,640 81.8%

In addition to helping customers save energy and reduce their demand, HHH has provided educational information that will help to create a conservation culture in Ontario and invested in creating new and innovative solutions to the electricity problems faced by Ontario.

Overall program performance has exceeded our initial objectives in terms of the types of projects we planned to initiate and the annual energy reduction from installed measures equates to a 0.3% reduction in energy usage and a life cycle reduction of 4.4%, nearly meeting our target of 5% after the second year of CDM program offerings.



6. Appendices

6.1. Appendix A: Evaluation of the HHH 2006 CDM Plan

Appendix A - Evaluation of the HHH 2006 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-to-date	Total for 2006	Residential	Commercial	Institutional	Industrial	Agricultural	LDC System	⁴ Smart Meters	Other #1	Other #2
Net TRC value (\$):	\$ 152,585	\$ 37,739	\$ 252,055	\$ (214,316)	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Benefit to cost ratio:	1.16	1.05	3.54	0.66	0.00	0.00	0.00	0.00		0.00	0.00
Number of participants or units delivered:	47,615	26,934	26,929	5							
Lifecycle (kWh) Savings:	21,951,673	14,013,329	5,223,476	8,789,853	0	0	0	0		0	0
Report Year Total kWh saved (kWh):	1,752,510	1,241,475	749,333	492,142	0	0	0	0		0	0
Total peak demand saved (kW):	151	45	8	37	0	0	0	0		0	0
Total kWh saved as a percentage of total kWh delivered (%):	0.37%	0.27%	0.16%	0.11%							
Peak kW saved as a percentage of LDC peak kW load (%):		0.05%	0.01%	0.04%							
¹ Report Year Gross C&DM expenditures (\$):	\$ 534,640	\$ 388,858	\$ 63,099	\$ 301,280	\$ -	\$ -	\$ -	\$ -	\$ 24,479	\$ -	\$ -
² Expenditures per kWh saved (\$/kWh):	0.02	\$ 0.03	\$ 0.01	\$ 0.03	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
³ Expenditures per kW saved (\$/kW):	3,535.49	\$ 8,599.06	\$ 7,897.25	\$ 8,092.18	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Utility discount rate (%):	7.94										



6.2. Appendix B: Discussion of the Programs

6.2.1. Residential

6.2.1.1. Residential Customer Conservation Education (2 pages)

Appendix B - Discussion of the Program

Residential Customer Conservation Education

A. Name of the Program:		RESIDENTIAL - Customer Conservation Education			
Description of the program (including intent, design, delivery, partnerships and evaluation):					
The Residential Customer Conservation Education program has the primary role of encouraging a conservation culture in HHH's customer base. During 2006, several educational initiatives were funded by HHH including the Halton Learning Foundation's energy conservation program for Halton schools and the Halton Energy Drill for reducing peak requirements at Halton regional sites during critical periods. The external costs incurred for CDM reporting have also been included in Residential Customer Conservation and Education.					
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		19,000			
B. TRC Results:			Reporting Year	Life-to-date TRC Results:	
¹ TRC Benefits (\$):			\$ -	\$ -	
² TRC Costs (\$):					
	Utility program cost (excluding incentives):		\$ 20,996.00	\$ 29,355.00	
	Incremental Measure Costs (Equipment Costs)		\$ -	\$ -	
	Total TRC costs:		\$ 20,996.00	\$ 29,355.00	
	Net TRC (in year CDN \$):		-\$ 20,996.00	-\$ 29,355.00	
	Benefit to Cost Ratio (TRC Benefits/TRC Costs):		\$ -	\$ -	
C. Results: (one or more category may apply)		Cumulative Results:			
Conservation Programs:					
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):					
Peak hours dispatched in year (hours):					



Appendix B: Residential Customer Conservation Education (page 2)

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. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ 20,996.00	\$ 29,355.00
	Incentive:	\$ -	\$ -
	Total:	\$ 20,996.00	\$ 29,355.00
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Incentive:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

This program is for educational initiatives and there are no TRC benefits. These costs are included in Appendix A as HHH expenditure for 2006.



6.2.1.2. Customer Coupons – Spring EKC (2 pages)

Appendix B - Discussion of the Program

Customer Coupon - Spring Every Kilowatt Counts (EKC)

A. **Name of the Program:** RESIDENTIAL - Customer Coupon - Spring EKC

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

In the spring of 2006, the Ontario Power Authority (OPA) initiated a residential coupon program across Ontario with the assistance of local electricity distribution companies. The program was called Every Kilowatt Counts (EKC) and included coupons to be redeemed at local hardware and other retailers for compact fluorescent lights (CFLs), ceiling fans, timers and programmable thermostats. HHH has included our results from the Spring EKC program even though there were no third tranche CDM expenditures since this program replaced the ENERconnect Coupon program that HHH participated in during 2005 using CDM funding.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
<i>Base case technology:</i>	Incandescent Light		
<i>Efficient technology:</i>	15W CFL	Programmable Thermostats	Ceiling Fans and Timers
<i>Number of participants or units delivered for reporting year:</i>	2346	42	48 / 65
<i>Measure life (years):</i>	4	18	20
<i>Number of Participants or units delivered life to date</i>	2346	42	113

B. TRC Results:	Reporting Year	Life-to-date TRC Results:
¹ TRC Benefits (\$):	\$ 72,271.00	\$ 72,271.00
² TRC Costs (\$):		
<i>Utility program cost (excluding incentives):</i>	\$ 9,470.00	\$ 9,470.00
<i>Incremental Measure Costs (Equipment Costs)</i>	\$ 9,019.00	\$ 9,019.00
<i>Total TRC costs:</i>	\$ 18,489.00	\$ 18,489.00
Net TRC (in year CDN \$):	\$ 53,782.00	\$ 53,782.00
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>	\$ 3.91	\$ 3.91

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

Conservation Programs:

	Summer		Winter	
	lifecycle	in year	Cumulative Lifecycle	Cumulative Annual Savings
<i>Demand savings (kW):</i>		2.51	2.51	
<i>Energy saved (kWh):</i>	1,362,117	244,686	1,362,117	244,686
<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>		



Appendix B: Customer Coupons – Spring EKC (page 2)

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>		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Incentive:	\$ -	\$ -
	Total:	\$ -	\$ -
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

This program was managed by the OPA. HHH used the prorated costs of the provincial program to calculate the TRC Costs, however, HHH did not spend any CDM money on this program. The provincial program costs were \$5,318,155 and HHH's prorated share of these costs was calculated as \$9,470 based on 2,501 coupons redeemed by HHH customers compared to 1,404,529 coupons in the province.



6.2.1.3. Customer Coupons – Fall EKC (2 pages)

Appendix B - Discussion of the Program

Customer Coupon - Fall Every Kilowatt Counts (EKC)

A. **Name of the Program:** RESIDENTIAL - Customer Coupon - Fall EKC

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

In the fall of 2006, the OPA continued the EKC program with another residential coupon offering across Ontario. The second coupon offering included coupons to be redeemed at local hardware and other retailers for compact fluorescent lights (CFLs), seasonal LED lights (SLEDs), programmable thermostats, baseboard programmable thermostats, dimmers and motion sensors for light switches. Like with the Spring EKC initiative, HHH has included our results from the Fall EKC program even though there were no third tranche CDM expenditures since this program replaced the ENERconnect Coupon program that HHH participated in during 2005 using CDM funding.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
<i>Base case technology:</i>			
<i>Efficient technology:</i>	15W CFLs / SLEDs	pThermostats / Baseboard version	Dimmers / Motion Sensors
<i>Number of participants or units delivered for reporting year:</i>	3,200 / 1,164	51 / 1	99 / 36
<i>Measure life (years):</i>	4 / 30	18	10 / 20
<i>Number of Participants or units delivered life to date</i>	4364	52	135

B. TRC Results:	Reporting Year		Life-to-date TRC Results:		
	¹ TRC Benefits (\$):	\$	139,685.00	\$	139,685.00
² TRC Costs (\$):					
	<i>Utility program cost (excluding incentives):</i>	\$	11,998.00	\$	11,998.00
	<i>Incremental Measure Costs (Equipment Costs)</i>	\$	12,249.00	\$	12,249.00
	<i>Total TRC costs:</i>	\$	24,247.00	\$	24,247.00
Net TRC (in year CDN \$):	\$	115,438.00	\$	115,438.00	
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>	\$	5.76	\$	5.76	

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

Conservation Programs:

Demand savings (kW):	Summer	5.48	5.48	
	Winter	96.14	96.14	
	<i>lifecycle</i>	<i>in year</i>	<i>Cumulative Lifecycle</i>	<i>Cumulative Annual Savings</i>
<i>Energy saved (kWh):</i>	2,888,783	377,663	2,888,783	377,663
<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>		



Appendix B: Customer Coupons – Fall EKC (page 2)

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>		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Incentive:	\$ -	\$ -
	Total:	\$ -	\$ -
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

This program was managed by the OPA. HHH used the prorated costs of the provincial program to calculate the TRC Costs, however, HHH did not spend any CDM money on this program. The provincial program costs were \$5,089,954 and HHH's prorated share of these costs was calculated as \$11,998 based on 2,504 coupons redeemed by HHH customers compared to 1,062,273 coupons in the province.



6.2.1.4. Customer Coupons – Appliance Survey (2 pages)

Appendix B - Discussion of the Program

Customer Coupon - Appliance Survey

A. **Name of the Program:** RESIDENTIAL - Customer Coupon - Appliance Survey

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

In 2006, the program involved giving CFLs to customers visiting Home Hardware stores in exchange for the completion of a survey on appliance use. HHH undertook this survey to better understand residential customer needs in terms of possible residential appliance programs for the future.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	Incandescent Light		
Efficient technology:	15W CFL		
Number of participants or units delivered for reporting year:	660		
Measure life (years):	4		
Number of Participants or units delivered life to date	660		

B. TRC Results:	Reporting Year	Life-to-date TRC Results:
¹ TRC Benefits (\$):	\$ 14,377.67	\$ 14,377.67
² TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ 3,923.00	\$ 3,923.00
Incremental Measure Costs (Equipment Costs):	\$ 1,188.00	\$ 1,188.00
Total TRC costs:	\$ 5,111.00	\$ 5,111.00
Net TRC (in year CDN \$):	\$ 9,266.67	\$ 9,266.67
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ 2.81	\$ 2.81

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

Conservation Programs:

	Summer		Cumulative Lifecycle	Cumulative Annual Savings
	Winter			
Demand savings (kW):				
	lifecycle	in year		
Energy saved (kWh):	275,616	68,904	275,616	68,904
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):		



Appendix B: Customer Coupons – Appliance Survey (page 2)

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

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):		
-------------------	--	--

Actual Program Costs:		Reporting Year	Cumulative Life to Date
<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i>	\$ -	\$ -
	<i>Incremental O&M:</i>	\$ 3,923.00	\$ 3,923.00
	<i>Incentive:</i>	\$ 1,737.00	\$ 1,737.00
	<i>Total:</i>	\$ 5,660.00	\$ 5,660.00
<i>Utility indirect costs (\$):</i>	<i>Incremental capital:</i>	\$ -	\$ -
	<i>Incremental O&M:</i>	\$ -	\$ -
	<i>Total:</i>	\$ -	\$ -

Assumptions & Comments:

The appliance surveys were completed to gain information to support future CDM services for our residential customers. The CFL provided a reward for completing this survey and generated benefits in terms of kWh savings as well.



6.2.1.5. ENERconnect Coupon Program (2 pages)

Appendix B - Discussion of the Program

Customer Coupon - ENERconnect

A. **Name of the Program:** RESIDENTIAL - Customer Coupons - ENERconnect

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

In 2005, ENERConnect offered a coupon program to LDCs that provided coupons for energy efficient merchandise at Canadian Tire stores. During 2006, this program was displaced by the OPA Every Kilowatt Counts programs. However, there were costs included in 2006 related to the 2005 ENERconnect coupon program including a charge of \$5,885 that was more than off-set by the increase in 2005 expenditures reported in 2005 of \$6,456. The net amount of -\$571 has been reported for 2006. The total amount of CDM expenditures for 2006 is less than the fourth quarter 2006 report by this \$6,456.

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			

B. TRC Results:	Reporting Year	Life-to-date TRC Results:
¹ TRC Benefits (\$):	\$ -	\$ 68,647.00
² TRC Costs (\$):		
Utility program cost (excluding incentives):	-\$ 571.00	\$ 3,305.00
Incremental Measure Costs (Equipment Costs)	\$ -	\$ 8,157.00
Total TRC costs:	-\$ 571.00	\$ 11,462.00
Net TRC (in year CDN \$):	\$ 571.00	\$ 57,185.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ -	\$ 5.99

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

Conservation Programs:		lifecycle	in year	Cumulative Lifecycle	Cumulative Annual Savings
Demand savings (kW):	Summer				
	Winter				
Energy saved (kWh):				1,555,319	140,904
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):			



Appendix B: ENERconnect Coupon Program (page 2)

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. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	-\$ 571.00	\$ 3,305.00
	Incentive:	\$ -	\$ 4,968.00
	Total:	-\$ 571.00	\$ 8,273.00
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:



6.2.1.6. Water Heater Load Control (2 pages)

Appendix B - Discussion of the Program

Water Heater Load Control

A. **Name of the Program:** RESIDENTIAL - Water Heater Load Control

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

The HHH Water Heater Load Control (WHLC) program is implemented on new water heaters as well as replacement water heaters. The percentage of replacement installations is assumed to be 88% while the remaining 12% are new water heater installations. These are the actual replacement and new water heater installation rates for the combined period of 2004 and 2005. HHH has assumed an increase in efficiency on the replacement water heaters of 15% due to the decline in efficiency of water heaters as they age. A 10% Free Ridership rate is assumed in the energy saving calculation but a 0% Free Ridership rate is used for the Avoided Capacity Costs for Demand Response since the residential customers would not choose to have a control mechanism installed in the absence of this program.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
<i>Base case technology:</i>	Existing Water Heater	No Load Control	
<i>Efficient technology:</i>	New Water Heater	Utility Load Control	
<i>Number of participants or units delivered for reporting year:</i>	132	132	
<i>Measure life (years):</i>	12	12	
<i>Number of Participants or units delivered life to date</i>	217	217	

	Reporting Year	Life-to-date TRC Results:
B. TRC Results:		
¹ TRC Benefits (\$):	\$ 125,056.00	\$ 193,409.00
² TRC Costs (\$):		
<i>Utility program cost (excluding incentives):</i>	\$ 31,063.00	\$ 87,382.00
<i>Incremental Measure Costs (Equipment Costs)</i>	\$ -	\$ -
<i>Total TRC costs:</i>	\$ 31,063.00	\$ 87,382.00
Net TRC (in year CDN \$):	\$ 93,993.00	\$ 106,027.00
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>	\$ 4.03	\$ 2.21

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

Conservation Programs:

	Demand savings (kW):		Cumulative Lifecycle	Cumulative Annual Savings
	Summer	Winter		
<i>Energy saved (kWh):</i>	lifecycle 696,960	in year 58,080	1,371,960	114,330
<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>	109.56	180.11
<i>Peak hours dispatched in year (hours):</i>		



Appendix B: Water Heater Load Control (page 2)

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. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ 37,014.00	\$ 65,314.00
	Incremental O&M:	\$ -	\$ 28,019.00
	Incentive:	\$ -	\$ -
	Total:	\$ 37,014.00	\$ 93,333.00
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

Although this is a demand response program, the installation of newer, more efficient water heaters also generates some kWh savings. The kWh savings are estimated to be 58% of the TRC savings of 750 kWh/yr per water heater.



6.2.2. Commercial

6.2.2.1. Commercial Customer Conservation Education (2 pages)

Appendix B - Discussion of the Program

Customer Conservation Education

A. **Name of the Program:** COMMERCIAL - Customer Conservation Education

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

Like its Residential equivalent, the Commercial Customer Conservation Education initiatives have the primary role of encouraging a conservation culture in HHHOs customer base. During 2006, several educational initiatives were funded by HHH including the continuation of the Enerconnect e-meter program and an Energy Newsletter for commercial customers.

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	19,000		

B. TRC Results:	Reporting Year	Life-to-date TRC Results:
¹ TRC Benefits (\$):	\$ -	\$ -
² TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ 17,850.00	\$ 35,833.00
Incremental Measure Costs (Equipment Costs)	\$ -	\$ -
Total TRC costs:	\$ 17,850.00	\$ 35,833.00
Net TRC (in year CDN \$):	-\$ 17,850.00	-\$ 35,833.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ -	\$ -

C. Results: (one or more category may apply)	Cumulative Results:			
Conservation Programs:				
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):				
Peak hours dispatched in year (hours):				



Appendix B: Commercial Customer Conservation Education (page 2)

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 (kW):		
Fuel type:		

Other Programs (specify):

Metric (specify):		
-------------------	--	--

D. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ 17,850.00	\$ 35,833.00
	Incentive:	\$ -	\$ -
	Total:	\$ 17,850.00	\$ 35,833.00
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

This program is for educational initiatives and there are no TRC benefits. These costs are included in Appendix A as HHH expenditure for 2006.



6.2.2.2. Commercial Industrial Audits (2 pages)

Appendix B - Discussion of the Program

Commercial Industrial Audits

A. **Name of the Program:** COMMERCIAL - Commercial Industrial Audits

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

There was a refund from Powerwise of \$5,629 from the costs reported in 2005 to reflect the difference between the expected and actual costs of an inverter installation in the Mold Masters SportsPlex. This refund was received and reported during 2006.

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):	10		
Number of Participants or units delivered life to date	1		

B. TRC Results:	Reporting Year	Life-to-date TRC Results:
¹ TRC Benefits (\$):		\$ 231,222.13
² TRC Costs (\$):		
Utility program cost (excluding incentives):		\$ 49,277.00
Incremental Measure Costs (Equipment Costs):	-\$ 5,629.00	\$ 121,759.59
Total TRC costs:	-\$ 5,629.00	\$ 171,036.59
Net TRC (in year CDN \$):	\$ 5,629.00	\$ 60,185.54
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	N/A	\$ 1.35

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

Conservation Programs:

	Summer		Cumulative Lifecycle	Cumulative Annual Savings
	Winter			
Demand savings (kW):	0	0		
	lifecycle	in year		
Energy saved (kWh):	0	0	5,708,025	313,881
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):		



Appendix B: Commercial Industrial Audits (page 2)

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. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	-\$ 5,629.00	\$ 48,648.00
	Incremental O&M:	-	-
	Incentive:	\$ -	-
	Total:	-\$ 5,629.00	\$ 48,648.00
Utility indirect costs (\$):	Incremental capital:	\$ -	-
	Incremental O&M:	\$ -	-
	Total:	\$ -	-

E. Assumptions & Comments:

There was a credit during 206 for the equipment installed in this project.



6.2.2.3. System Loss Reduction – Municipal Lighting Retrofits (2 pages)

Appendix B - Discussion of the Program

System Loss Reductions - Municipal Lighting Retrofits

A. **Name of the Program:** COMMERCIAL - System Loss Reductions: Municipal Lighting Retrofits

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

HHH funded lighting retrofits at four municipal sites in the Town of Halton Hills. These included the Acton Indoor Pool, the Robert C Austin Public Works Facility, the Prospect Park Pavilion and the Cedarville Daycare Centre.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
<i>Base case technology:</i>	4- T4 34W (156W) fluorescent		
<i>Efficient technology:</i>	Low Watt electronic ballast + 25W T8 fluorescent		
<i>Number of participants or units delivered for reporting year:</i>	309		
<i>Measure life (years):</i>	5		
<i>Number of Participants or units delivered life to date</i>	309		

B. TRC Results:	Reporting Year		Life-to-date TRC Results:		
	¹ TRC Benefits (\$):	\$	23,294.85	\$	23,294.85
² TRC Costs (\$):					
	<i>Utility program cost (excluding incentives):</i>	\$	5,008.00	\$	5,008.00
	<i>Incremental Measure Costs (Equipment Costs)</i>	\$	8,372.70	\$	8,372.70
	<i>Total TRC costs:</i>	\$	13,380.70	\$	13,380.70
<i>Net TRC (in year CDN \$):</i>	\$	9,914.15	\$	9,914.15	
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>	\$	1.74	\$	1.74	

C. Results: (one or more category may apply)	Cumulative Results:			
Conservation Programs:				
<i>Demand savings (kW):</i>		<i>Summer</i>	18,231	18,231
		<i>Winter</i>		
	<i>lifetime</i>	<i>in year</i>		<i>Cumulative Lifecycle</i>
<i>Energy saved (kWh):</i>	350,993	70,199	350,993	70,199
<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>				



Appendix B: System Loss Reduction – Municipal Lighting Retrofits (page 2)

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. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ 5,008.00	\$ 5,008.00
	Incentive:	\$ 9,303.00	\$ 9,303.00
	Total:	\$ 14,311.00	\$ 14,311.00
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

The OEB guide did not have data for the exact technologies being installed, so the TRC was completed using the best fit information for the majority of the replacements. There were miscellaneous lights replaced with different parameters, but the average and the majority of the lights were closest to the technologies shown in the descriptions above.



6.2.2.4. System Loss Reduction – Boiler Upgrade (2 pages)

Appendix B - Discussion of the Program

System Loss Reductions - Boiler Upgrades

A. **Name of the Program:** COMMERCIAL - System Loss Reductions - Boiler Upgrades

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

HHH converted the electric powered HVAC system for our head office to gas powered heating, air conditioning and make-up air units. This change displaced all electricity consumption for the old units.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
<i>Base case technology:</i>			
<i>Efficient technology:</i>	Electric HVAC System	Gas Make-up Air and A/C	
<i>Number of participants or units delivered for reporting year:</i>	1	1	
<i>Measure life (years):</i>	20	20	
<i>Number of Participants or units delivered life to date</i>	1	1	

B. TRC Results:	Reporting Year		Life-to-date TRC Results:		
	¹ TRC Benefits (\$):	\$	364,209.06	\$	364,209.06
² TRC Costs (\$):					
	<i>Utility program cost (excluding incentives):</i>	\$	-	\$	-
	<i>Incremental Measure Costs (Equipment Costs)</i>	\$	89,772.81	\$	89,772.81
	<i>Total TRC costs:</i>	\$	89,772.81	\$	89,772.81
Net TRC (in year CDN \$):	\$	274,436.25	\$	274,436.25	
<i>Benefit to Cost Ratio (TRC Benefits/TRC Costs):</i>	\$	4.06	\$	4.06	

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

Conservation Programs:

Demand savings (kW):	Summer		Cumulative Lifecycle	Cumulative Annual Savings
	Winter			
	<i>lifecycle</i>	<i>in year</i>		
Energy saved (kWh):	8,438,860	421,943	8,438,860	421,943
Other resources saved :				
<i>Natural Gas (m3):</i>				
<i>Other (specify):</i>				

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):		



Appendix B: System Loss Reduction – Boiler Upgrade (page 2)

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. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ 99,748.00	\$ -
	Incremental O&M:	\$ -	\$ -
	Incentive:	\$ -	\$ -
	Total:	\$ 99,748.00	\$ -
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:



6.2.2.5. System Loss Reduction – Transformer Upgrade (2 pages)

Appendix B - Discussion of the Program

System Loss Reductions - Transformer Upgrades

A. **Name of the Program:** COMMERCIAL - System Loss Reductions - Transformer Upgrades

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

HHH reported expenditures of \$50,000 for transformer upgrades in 2006. Following a review of the TRC costs, HHH has decided to remove this expenditure from their 2006 CDM expenditures and an adjustment will be made in the first quarter of 2007 to reflect this change.

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			

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

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

Conservation Programs:

	Summer		Cumulative Lifecycle	Cumulative Annual Savings
	Winter			
	lifecycle	in year		
Demand savings (kW):				
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):		



Appendix B: System Loss Reduction – Transformer Upgrade (page 2)

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>		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Incentive:	\$ -	\$ -
	Total:	\$ -	\$ -
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

An adjustment will be made in Q1 2007 to remove the \$50,000 reported in 2006 for this initiative from CDM expenditures.



6.2.2.6. Load Shifting – ZEBRA Battery Pilot (2 pages)

Appendix B - Discussion of the Program

Load Shifting - ZEBRA Battery Pilot

A. **Name of the Program:** COMMERCIAL - Load Shifting - ZEBRA Battery Pilot

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

This pilot project aims to store electricity and discharge it during times of peak demand. Based on technology that uses advanced sodium-nickel-chloride batteries that are charged during off-peak hours when electricity demand and prices are low. The batteries are then discharged during the day, when demand and prices for power are high. The system is connected to software that will continuously calculate the best and most cost-efficient times to charge and discharge the battery units in future. The ZEBRA Battery pilot uses off-the-shelf technologies including 5 environmentally friendly batteries each with a capability of 20 kWh to shift load from peak to off-peak times. Funding partners included LDC Tomorrow Fund, the OPA Technology Fund and Scientific Research and Experimental Development. With the assistance of all of these funding partners, HHH is exploring the economic feasibility of reducing Ontario's peak load through the use of battery technology. HHH used \$175,000 of CDM funding for this pilot.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:			
Efficient technology:	ZEBRA Battery Pilot		
Number of participants or units delivered for reporting year:	1		
Measure life (years):	10		
Number of Participants or units delivered life to date	1		

	Reporting Year	Life-to-date TRC Results:
¹ TRC Benefits (\$):	\$ 23,022.63	\$ 23,022.63
² TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ -	\$ -
Incremental Measure Costs (Equipment Costs)	\$ 509,468.00	\$ 509,468.00
Total TRC costs:	\$ 509,468.00	\$ 509,468.00
Net TRC (in year CDN \$):	-\$ 486,445.37	-\$ 486,445.37
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ 0.05	\$ 0.05

	Cumulative Results:			
Conservation Programs:				
Demand savings (kW):	Summer	19	19	
	Winter			
	lifecycle	in year	Cumulative Lifecycle	Cumulative Annual Savings
Energy saved (kWh):	0	0	0	0
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):		7500		7500
Energy shifted Mid-peak to Off-peak (kWh):				
Demand Response Programs:				
Dispatchable load (kW):				
Peak hours dispatched in year (hours):				



Appendix B: Load Shifting – ZEBRA Battery Pilot (page 2)

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 (Load Shifting):

Savings (\$/kWh/yr) obtained by shifting load	\$ 242.00
---	-----------

D. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ 175,000.00	\$ 175,000.00
	Incremental O&M:	\$ -	\$ -
	Incentive:	\$ -	\$ -
	Total:	\$ 175,000.00	\$ 175,000.00
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

This is a pilot program and there were no OEB measures applicable. The difference between the price to charge the batteries and the price off-set obtained by discharging the batteries results in an average daily saving of \$172 based on the actual HOEP prices for the period Jan 1, 2006 to Feb 28, 2007. This annual savings was included in the NPV Benefits. The kW reduction was included at a conservative level of 19 kW and the Free Rider rate was 0%.



6.2.3. Smart Metering (2 pages)

Appendix B - Discussion of the Program

Smart Metering

A. **Name of the Program:** RESIDENTIAL - Smart Metering

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

In 2006, HHH undertook research and development activities related to smart metering that was funded through CDM. A technical communications study was undertaken at a cost of \$6,000. Testing of new technologies and combinations to technologies was performed at a cost of \$13,000. Staff time was spent on site visits to other LDCs at cost of \$5,479. The total expenditures in this area are \$24,479. No additional work or expenditures are planned in CDM Smart Metering since the remaining activities will occur through non-CDM Smart Meter funding.

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	19,000		

B. TRC Results:	Reporting Year	Life-to-date TRC Results:
¹ TRC Benefits (\$):	\$ -	\$ -
² TRC Costs (\$):		
Utility program cost (excluding incentives):	\$ 24,479.00	\$ 24,479.00
Incremental Measure Costs (Equipment Costs):	\$ -	\$ -
Total TRC costs:	\$ 24,479.00	\$ 24,479.00
Net TRC (in year CDN \$):	-\$ 24,479.00	-\$ 24,479.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$ -	\$ -

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

Conservation Programs:

	Summer		Cumulative Lifecycle	Cumulative Annual Savings
	Winter			
	lifecycle	in year		
Demand savings (kW):				
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):		



Appendix B: Smart Metering (page 2)

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. Actual Program Costs:		Reporting Year	Cumulative Life to Date
Utility direct costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ 24,479.00	\$ 24,479.00
	Incentive:	\$ -	\$ -
	Total:	\$ 24,479.00	\$ 24,479.00
Utility indirect costs (\$):	Incremental capital:	\$ -	\$ -
	Incremental O&M:	\$ -	\$ -
	Total:	\$ -	\$ -

E. Assumptions & Comments:

2006 costs are related to research and program pilots. Installation costs are not included in CDM funding.



6.3. Appendix C: HHH Program and Portfolio Totals (7 pages)

Appendix C - HHH Program and Portfolio Totals

Report Year: 2006

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 (\$)
Res. Customer Conservation Education	\$ -	\$ 20,996	-\$ 20,996	0.00	0	0	0	\$ 20,996
Customer Coupons - Spring EKC	\$ 72,271	\$ 18,489	\$ 53,782	3.91	244,686	1,362,117	3	-
Customer Coupons - Fall EKC	\$ 139,685	\$ 24,247	\$ 115,438	5.76	377,663	2,888,783	5	-
Customer Coupons - Appliance Survey	\$ 14,378	\$ 5,111	\$ 9,267	2.81	68,904	275,616	0	\$ 5,660
Customer Coupons - ENERConnect	\$ -	-\$ 571	\$ 571	0.00	0	0	0	-\$ 571
Water Heater Load Control	\$ 125,056	\$ 31,063	\$ 93,993	4.03	58,080	696,960	0	\$ 37,014
Name of Program G			\$ -	0.00				
Name of Program H			\$ -	0.00				
Name of Program I			\$ -	0.00				
Name of Program J			\$ -	0.00				
*Totals App. B - Residential	\$ 351,390	\$ 99,335	\$ 252,055	3.54	749,333	5,223,476	8	\$ 63,099
Residential Indirect Costs not attributable to any specific program	→							
Total Residential TRC Costs		\$ 99,335						
**Totals TRC - Residential	\$ 351,390	\$ 99,335	\$ 252,055	3.54				



Appendix C: HHH Program and Portfolio Totals (page 2)

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 (\$)
Comm. Customer Conservation Educatio	\$ -	\$ 17,850	-\$ 17,850	0.00	0	0	0	\$ 17,850
Commercial Industrial Audits	\$ -	\$ 5,629	\$ 5,629	0.00	0	0	0	-\$ 5,629
System Loss - Municipal Lighting Retro.	\$ 23,295	\$ 13,381	\$ 9,914	1.74	70,199	350,993	18	\$ 14,311
System Loss - Boiler Upgrade	\$ 364,209	\$ 89,773	\$ 274,436	4.06	421,943	8,438,860	0	\$ 99,748
System Loss - Transformer Upgrade	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Load Shifting - ZEBRA Battery Pilot	\$ 23,023	\$ 509,468	-\$ 486,445	0.05	0	0	19	\$ 175,000
Name of Program G			\$ -	0.00				
Name of Program H			\$ -	0.00				
Name of Program I			\$ -	0.00				
Name of Program J			\$ -	0.00				
*Totals App. B - Commercial	\$ 410,527	\$ 624,843	-\$ 214,316	0.66	492,142	8,789,853	37	\$ 301,280
Commercial Indirect Costs not attributable to any specific program								
Total TRC Costs		\$ 624,843						
**Totals TRC - Commercial	\$ 410,527	\$ 624,843	-\$ 214,316	0.66				



Appendix C: HHH Program and Portfolio Totals (page 3)

3. Institutional 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 (\$)
Name of Program A			\$ -	0.00				
Name of Program B			\$ -	0.00				
Name of Program C			\$ -	0.00				
Name of Program D			\$ -	0.00				
Name of Program E			\$ -	0.00				
Name of Program C			\$ -	0.00				
Name of Program G			\$ -	0.00				
Name of Program H			\$ -	0.00				
Name of Program I			\$ -	0.00				
Name of Program J			\$ -	0.00				
*Totals App. B - Institutional	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Institutional Indirect Costs not attributable to any specific program								
Total TRC Costs		\$ -						
**Totals TRC - Institutional	\$ -	\$ -	\$ -	0.00				



Appendix C: HHH Program and Portfolio Totals (page 4)

4. 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 (\$)
Name of Program A			\$ -	0.00				
Name of Program C			\$ -	0.00				
Name of Program C			\$ -	0.00				
Name of Program D			\$ -	0.00				
Name of Program E			\$ -	0.00				
Name of Program F			\$ -	0.00				
Name of Program G			\$ -	0.00				
Name of Program H			\$ -	0.00				
Name of Program I			\$ -	0.00				
Name of Program J			\$ -	0.00				
*Totals App. B - Industrial	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Industrial Indirect Costs not attributable to any specific program								
Total TRC Costs		\$ -						
**Totals TRC - Industrial	\$ -	\$ -	\$ -	0.00				



Appendix C: HHH Program and Portfolio Totals (page 5)

5. Agricultural 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 (\$)
Name of Program A			\$ -	0.00				
Name of Program C			\$ -	0.00				
Name of Program C			\$ -	0.00				
Name of Program D			\$ -	0.00				
Name of Program E			\$ -	0.00				
Name of Program F			\$ -	0.00				
Name of Program G			\$ -	0.00				
Name of Program H			\$ -	0.00				
Name of Program I			\$ -	0.00				
Name of Program J			\$ -	0.00				
*Totals App. B - Agricultural	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
Agricultural Indirect Costs not attributable to any specific program								
Total TRC Costs		\$ -						
**Totals TRC - Agricultural	\$ -	\$ -	\$ -	0.00				



Appendix C: HHH Program and Portfolio Totals (page 6)

6. 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 (\$)
Name of Program A			\$ -	0.00				
Name of Program B			\$ -	0.00				
Name of Program C			\$ -	0.00				
Name of Program D			\$ -	0.00				
Name of Program E			\$ -	0.00				
Name of Program F			\$ -	0.00				
Name of Program G			\$ -	0.00				
Name of Program H			\$ -	0.00				
Name of Program I			\$ -	0.00				
Name of Program C			\$ -	0.00				
*Totals App. B - LDC System	\$ -	\$ -	\$ -	0.00	0	0	0	\$ -
LDC System Indirect Costs not attributable to any specific program								
Total TRC Costs		\$ -						
**Totals TRC - LDC System	\$ -	\$ -	\$ -	0.00				

7. 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 (\$) 24,479



Appendix C: HHH Program and Portfolio Totals (page 7)

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 (\$)
*TOTALS FOR ALL APPENDIX B	\$ 761,916	\$ 724,178	\$ 37,739	1.05	1,241,475	14,013,329	45	\$ 388,858
<i>Any other Indirect Costs not attributable to any specific program</i>	→							
TOTAL ALL LDC COSTS	\$ 761,916	\$ 724,178	\$ 37,739	1.05				
**LDC' PORTFOLIO TRC	\$ 761,916	\$ 724,178	\$ 37,739	1.05				

* 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.

6.4. Appendix D: Load Shifting Photo and July 11, 2006 Toronto Star Article



July 11, 2006 Toronto Star Article

CAREERS D11 WORKPLACE D13

Business

D SECTION THE TORONTO STAR TUESDAY, JULY 11, 2006 thestar.com

Acton utility flicks switch to launch 'load shifting' test

**Aim is to bank power in batteries
Pilot could spark investor interest**

TYLER RAMPTON
ONARIO REPORTER

Halton Hills Hydro Inc. will soon flick the switch on an ambitious energy-storage project that aims to change the way utilities and big industry manage their electricity use. The project also has potential to spark interest in a \$500-million manufacturing venture for southern Ontario.

Later this week, the Acton-based utility will begin storing power in a bank of advanced batteries during the night, when electricity demand is low and power prices are cheapest.

The batteries will then be discharged during the day, when demand and prices are typically at a peak for commercial and industrial users of electricity.

"Software will be used to judge when the best time to charge is, and will judge when is the best



Halton Hills Hydro president Dan Guatto says the firm's power project uses Swiss-made batteries to store electricity at night when demand is lower, with power discharged during peak periods.

time to discharge, optimizing the financial efficiency of this thing," said Dan Guatto, president of Halton Hills Hydro, located 45 minutes northwest of Toronto.

"What we hope to gain is knowledge of cost savings and

installation costs," Guatto added.

The project uses only five batteries with a total output of 100 kilowatt-hours, but can be scaled up to one megawatt-

► Please see Photos, D10