

Waterloo North Hydro Inc.

RP-2004-0203 \ EB-2005-0207

Conservation and Demand Annual Report

March 2006

1. INTRODUCTION AND BACKGROUND

Waterloo North Hydro Inc. (WNH) is the local electricity distribution company providing electricity distribution services to 48,000 customers in the City of Waterloo, the Township of Wellesley and the Township of Woolwich. Our service territory is 656 square kilometres, consisting mostly of rural areas – 590 square kilometres of rural territory and 66 square kilometers of urban territory. However, only 20% of our customer base is in the rural and small villages outside the City of Waterloo.

In December of 2003, the Minister of Energy indicated the government's intention to permit Local Distribution Companies (LDCs) to apply to the Ontario Energy Board (OEB) for the next installment of their allowable return on equity beginning March 1, 2005. The approval by the OEB for this final installment or third tranche was on the condition that LDCs reinvest an amount equal to one year's incremental returns of their third tranche, in conservation and demand management activities. The Minister of Energy in a letter dated May 31, 2004, granted written approval to all distributors to apply to the Ontario Energy Board for approval to establish a deferral account to record costs incurred with respect to conservation and demand management activities.

The Minister's letter indicated that LDCs should pursue a broad range of programs that support the more efficient use of electricity in Ontario, including those that were discontinued on the opening of the electricity market, to reduce customers' overall energy demand and/or demand for purchased energy.

The letter also indicated that reasonable expenditures on the planning, delivery and evaluation of any of the following measures should be supported by the Ontario Energy Board:

- energy efficiency;
- behavioural and operational changes, including the application of benchmarking or "smart" control systems;
- load management measures which facilitate interruptible and dispatchable loads, dual fuel applications, thermal storage, and demand response; measures to encourage fuel switching which reduces the total system energy for a given end-use;

- programs and initiatives targeted to low income and other hard to reach consumers; and
- distributed energy options behind a customer's meter such as tri-generation, co-generation, ground source heat pumps, solar, wind, and biomass systems.

On October 5, 2004 the Board issued a procedural order (RP-2004-0203) setting out the process for how distributors may apply for approval of a Conservation and Demand Management Plan, and stipulating the filing requirements for a distributor's plan. Distributors were given the option of applying for interim or final approval of their plan.

This section outlines the programs proposed as Waterloo North Hydro's conservation and demand management program in response to the Minister's Directive and the Procedural Order from the OEB.

OUR APPROACH

Prior to the opening of the electricity market, Waterloo North Hydro had an Energy Services Group that provided advice to customers on energy conservation and demand side management. Under restructuring for the electricity market, this function was discontinued. Our water heaters were sold to a gas company; some of our staff with expertise in this area retired and some were deployed elsewhere in the company.

Our approach to responding to the Minister's directive, has been to draw on the internal expertise, some outside expertise, discussion of programs with other utilities and information from various websites and sources listed by groups such as The Canadian Energy Efficiency Alliance. We have borrowed ideas from the experiences of B.C. Hydro, Manitoba Hydro and a few energy efficiency and geothermal websites in the United States.

We have put together a number of programs to touch on several customer sectors and address several of the objectives from the Minister's letter.

We found that programs involving outside agencies required quite an amount of work to lay the foundation for moving forward. As such, after we received approval for our CDM plans in March, 2005, the remainder of 2005 was a planning year for Waterloo North Hydro and many of the programs will be implemented beginning in 2006.

Please note that some of the measurable savings are preliminary figures and will be updated in future filings as the information is available.

CONSERVATION AND DEMAND MANAGEMENT PROGRAMS

1. Residential Energy Efficiency Project:

The Residential Energy Efficiency Project (REEP) is a non-profit initiative of the Faculty of Environmental Studies at the University of Waterloo and the Elora Centre for Environmental Excellence. Evaluators are trained and certified in accordance to Natural Resources Canada standards. R.E.E.P. uses the *Energuide for Houses* system to conduct a comprehensive assessment of a home's energy efficiency and provide recommendations for improvement.

The audit involves examining the windows and doors, attic and wall insulation, foundation, and heating/ventilation system, as well as executing a scientific air leakage test.

This program is aimed at raising consumer awareness of the benefits of energy efficiency, such as energy-cost savings, improved home comfort and indoor air quality. It will also identify and prioritize energy efficiency upgrades, providing consumers the facts needed to make informed decisions about their home energy use. The program leverages an existing program that is well established in the area.

In REEP's report to WNH it was stated, "By supporting REEP, WNH is demonstrating a clear commitment to energy conservation and promoting a healthy environment in Waterloo Region."

CDM Funds Committed: \$30,000

CDM Funds Spent to December 31, 2005: \$30,000

Initiative Status at December 31, 2005: Completed

Measurable Results Available: Yes

Comments: Measurable Results have been estimated by REEP; however, savings data is still currently in the process of being updated.

In addition to kWh Savings, it has been reported that WNH customers have also reduced 301 tonnes of CO₂ emissions in 2005.

Anticipated Completion Date: Completed

2. Energy Efficient Traffic Lights and Street Lighting

The Region of Waterloo provides traffic lights at all intersections throughout the Regional Municipality of Waterloo. New traffic light installations use LED lights to illuminate the vehicle and pedestrian signals, while older installations use incandescent light bulbs. The LED lights use significantly less electricity than incandescent bulbs and the LED lights last six to ten times longer. However, the LED lamps are substantially more expensive and can range up to \$150 per LED lamp compared to \$2 per incandescent bulb.

Waterloo North Hydro, along with Cambridge and North Dumfries Hydro and Kitchener-Wilmot Hydro, propose to partially fund the replacement of incandescent bulbs with LED bulbs in the traffic lights throughout the Region.

This program will result in significant energy savings as the LED lights use 80 to 90% less electricity. It will also reduce maintenance costs as the LED bulbs last longer and are more visible.

CDM Funds Committed:	\$100,000
CDM Funds Spent to December 31, 2005:	NIL
Initiative Status at December 31, 2005:	Planning Started with Region of Waterloo
Measurable Results Available:	No
Comments:	The Regional Municipality of Waterloo has approved this project and is currently working on preparing the tender documents for the commencement of the project in the spring of 2006.
Anticipated Completion Date:	2007

2. Energy Efficient Traffic Lights and Street Lighting - continued

Several years ago, Waterloo North Hydro worked with the municipalities in our service area to replace old street lighting with energy efficient high-pressure sodium (HPS) streetlights. A number of streetlights were not replaced at the time in the rural areas and some villages of the townships in the service area. Waterloo North Hydro proposes to work with the municipalities to fund the replacement of these old street light fixtures with newer, energy efficient HPS streetlights.

This program will result in energy savings, as the HPS streetlights are more efficient. It is difficult to determine the amount of savings until the individual street light locations and existing equipment is identified. This program will also reduce maintenance costs.

CDM Funds Committed:	\$50,000
CDM Funds Spent to December 31, 2005:	NIL
Initiative Status at December 31, 2005:	Planning Started
Measurable Results Available:	No
Comments:	WNH has had an ongoing dialogue with the Townships of Wellesley and Woolwich and is working at their level in order to commence the project.
Anticipated Completion Date:	2007

3. Loss Reduction on the Distribution System

Waterloo North Hydro will investigate and install technologies that will reduce losses on the distribution system. These technologies will include the deployment of capacitor banks, voltage conversion programs and upgrading of old transformers to newer low loss transformers.

All of these programs are aimed at energy efficiency of the distribution system, will help to reduce distribution system losses and will reduce the system demand. This in turn will help relieve growth strains on transmission network capacity and demand for generation capacity. These reductions will benefit all customers and will effect permanent changes that are not reliant on sustained changes in customer consumption.

CDM Funds Committed:	\$365,000
CDM Funds Spent to December 31, 2005:	NIL
Initiative Status at December 31, 2005:	Not Started
Measurable Results Available:	No
Comments:	Work commenced in installing capacitor banks in 2006. Resources in 2005 were re-allocated to the Smart Meter Initiative.
Anticipated Completion Date:	2007

4. Smart Metering Pilot Project

Waterloo North Hydro has been reviewing several technologies as possible metering replacements for single-phase customers less than 50 kW demand (mostly residential). WNH has several areas where wireless communication may be an issue that will test the effectiveness of the Smart Meter technologies. We proposed a pilot involving approximately 1,500 locations to be retrofitted with Smart Meters.

This project will support the Ministry of Energy commitment to deploy Smart Meters and is a technology that will enable behavioural changes in conservation and demand management. We are, however, unable to determine the net effect as this project must work in conjunction with rate structures to be determined by the OEB to encourage customers to conserve energy or shift the time of day for energy use.

CDM Funds Committed:	\$300,000
CDM Funds Spent to December 31, 2005:	\$ 5,128
Initiative Status at December 31, 2005:	Involved heavily in OUSM Project in 2005
Measurable Results Available:	No
Comments:	The funds spent in 2005 were for a Consultant's Report; however, the pilot project was put on hold with the announcement of the Ontario Government's Bill 21, Section 53.8. Recently the OEB has issued further guidelines on Smart Meters in their Generic 2006 Electricity Distribution Rate Issues, which have clarified a portion of the situation. Further definition of the roles and responsibilities of the Smart Meter Entity is still needed for WNH to commence the smart meter pilot program in 2006.
Anticipated Completion Date:	2007

5. Geothermal Energy Program

About 5% of Waterloo North Hydro customers are rural customers without access to natural gas for their primary heating source. Approximately 20% of our customers use electricity for the primary fuel source for home heating and hot water heating, and a larger percentage use electricity for home air conditioning.

An alternative source is available in geothermal energy systems for heating and cooling of homes, as well as hot water heating. The technology has been used in commercial buildings and custom homes for many years, and the technology has developed to a point where it is quite feasible to heat and cool all sizes of homes. The hurdle for some homebuilders is that the initial investment of installing a geothermal system costs more than the installation of a traditional furnace. The savings in energy costs however will more than pay for the extra initial costs of the geothermal system.

Waterloo North Hydro believes that finding alternative energy sources is very important for our rural customers and customers on electric heating. The Draft Report on implementing Smart Meters suggests that these customers may see rising heating costs under the proposed RPP under Smart Meters in the future. We also see fuel switching to geothermal systems as a long term and more dependable form of conservation, than programs where we need to rely on customer awareness and self-discipline to conserve energy. Waterloo North Hydro proposes to invest seed money into a local initiative that will promote the installation of geothermal systems for residential customers by funding the initial capital costs and then obtain repayment for the capital costs from the energy savings that the customer will be expected to see on their electricity bill.

Waterloo North Hydro will match the funds put into this initiative by a local geothermal energy company to allow the joint venture initiative to obtain support and funding from the financial institutions. The seed money will be required over a two to three year period to allow the joint venture to become self-sustaining.

This initiative will encourage fuel switching from electricity as a heating and cooling source. Waterloo North Hydro sees this as a more permanent and sustainable reduction in demand on the electricity energy supply as well as being a form of distributed energy sources.

5. Geothermal Energy Program - continued

CDM Funds Committed:	\$250,000
CDM Funds Spent to December 31, 2005:	NIL
Initiative Status at December 31, 2005:	Joint Venture Company established in December, 2005
Measurable Results Available:	No
Comments:	A portion of the Start Up Funds will be issued in early 2006. The Joint Venture Project has resulted in Lifetime Energy Inc. formally launching their marketing and product offering in early 2006. Geothermal Installation Services are actively offered to customers at this time with installations to begin in the 2006 spring construction season.
Anticipated Completion Date:	2007

6. Energy Audits for Industrial, Commercial and Institutional Customers

Waterloo North Hydro recognizes that we need to work with our customers to keep them successful in business if we are to retain them as viable successful customers. Energy Audits for Industrial, Commercial and Institutional customers will help these customers to shift load from peak times and to find ways to conserve energy. We propose to partner with a local Energy Audit Services provider to deliver audits to our customers. Waterloo North Hydro will investigate methods to promote to our customers the use of Energy Audits and the implementation of the recommendations from Energy Audits.

This program is aimed at consumer awareness and education at the business and institutional level. It should encourage behavioural and operational changes that will reduce demand and conserve energy. This program will leverage the expertise of a local, established services provider.

CDM Funds Committed:	\$50,000
CDM Funds Spent to December 31, 2005:	NIL
Initiative Status at December 31, 2005:	Not Started
Measurable Results Available:	No
Comments:	Waterloo North Hydro is working with Cambridge and North Dumfries Hydro and Kitchener-Wilmot Hydro to present the Cool Shops Program to customers in the Region of Waterloo. This program will be launched in 2006.
Anticipated Completion Date:	2006

7. Low Income Consumer Retrofit Program

Waterloo North Hydro has been a supporter of the Heat Bank in the Region of Waterloo. The Heat Bank is a service in its third year of operation, funded by the local hydro companies and administered through the Regional Social Services. The Heat Bank serves as a last source of support to purchase heat and energy for low-income households.

In the 2005 season, Waterloo North Hydro will work with the Regional Social Services to identify and implement energy efficiency programs for Heat Bank recipients. In 2006 WNH will again work with Regional Social Services on new programs for low income consumers. These programs may include home energy assessments and will look at retrofit programs for such items as occupancy sensor thermostats, lower wattage stove elements, weatherstripping, compact fluorescent light bulbs and efficient showerheads.

This project is aimed at raising awareness of the benefits of energy efficiency and energy-cost savings for low-income consumers. The project will leverage the expertise of an existing program in the area for home audits as well as the knowledge of the Regional Social Services network.

CDM Funds Committed:	\$30,000
CDM Funds Spent to December 31, 2005:	\$ 3,000
Initiative Status at December 31, 2005:	Started
Measurable Results Available:	No
Comments:	In 2006 WNH will again work with Regional Social Services on new programs for low income consumers.
Anticipated Completion Date:	2006

8. Energy Conservation Information for Consumers

Waterloo North Hydro currently has a website that has some information on energy conservation for homeowners. Most of the information is simply retained from our expertise prior to utility restructuring. We are working with a website developer, updating our website to provide easier access to more information on energy efficiency and links to other websites.

Waterloo North Hydro will also invest in providing brochures educating and promoting energy efficiency.

CDM Funds Committed:	\$30,000
CDM Funds Spent to December 31, 2005:	\$17,065
Initiative Status at December 31, 2005:	Not Started
Measurable Results Available:	No
Comments:	Brochures were purchased in 2005, however, the brochures were distributed in 2006, and thus, no measurable savings could be achieved.
Anticipated Completion Date:	2006

2. EVALUATION OF THE CDM PLAN

Evaluation of the applicable plans is attached in Appendix A, which provides an overview of the effectiveness of WNH's CDM plan. As noted above, only two initiatives have been completed in 2005, with only the planning work started on others in 2005.

3. DISCUSSION OF THE PROGRAMS

Appendix B has been attached for each of the programs, in addition to the details and status of each CDM program.

4. LESSONS LEARNED

Waterloo North Hydro used 2005 as a planning and assessment year for the CDM program and has gained valuable knowledge in the administering of future programs. The Smart Metering Pilot Project was delayed and continues to be delayed awaiting decisions from the Ministry of Energy. Waterloo North Hydro also learned that programs involving third parties such as municipalities and social services require more time for planning, approvals and implementation.

Waterloo North Hydro considered 2005 a planning year and had two programs with estimated measurable results, one of these programs is not complete, and thus, a full assessment of its effectiveness is not yet able to be done (Low Income Customer Retrofit Program).

Waterloo North Hydro assesses its contribution towards the REEP program as a success, not only in terms of its Net TRC calculation (as demonstrated by the positive TRC calculation), but also in terms of the social good. As mentioned above, REEP stated, "By supporting REEP, WNH is demonstrating a clear commitment to energy conservation and promoting a healthy environment in Waterloo Region." Waterloo North Hydro considers this to be a worthwhile project that could be funded in the future.

5. CONCLUSION

As discussed above, Waterloo North Hydro gained valuable experience and knowledge in 2005 to apply in its future administering of its CDM programs and should have more energy savings in 2006 to measure and report.

Waterloo North Hydro has a Net TRC value of \$18,349 with limited execution of the CDM programs in 2005.

Waterloo North Hydro's continued participation in the Smart Metering UtilAssist OUSM Group will enable us to gain knowledge in implementing an effective smart meter program when the details and specifications are released by the Ministry of Energy.

Appendix A - Evaluation of the CDM Plan

	WATERLOO NORTH HYDRO INC.										
	Total	Residential	Commercial	Institutional	Industrial	Agricultural	LDC System	Programs Not Started	Other 2	Other 3	Other 4
Net TRC value (\$):		\$18,439									
Benefit to cost ratio:		\$2									
Number of participants or units delivered:		183									
Total kWh to be saved over the lifecycle of the plan (kWh):		1,251,891									
Total in year kWh saved (kWh):		70,620									
Total peak demand saved (kW):		10									
Total kWh saved as a percentage of total kWh delivered (%):		0.09%									
Peak kW saved as a percentage of LDC peak kW load (%):		0.004%									
Gross in year C&DM expenditures (\$):		\$33,000						\$22,193			
Expenditures per kWh saved (\$/kWh)*:		\$0.03									
Expenditures per kW saved (\$/kW)**:		\$3,300									
Utility discount rate (%):		7.25%									

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

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 1. Residential Energy Efficiency Project (REEP)

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

REEP, a non-profit initiative of the Faculty of Environmental Studies at the University of Waterloo and the Elora Centre for Environmental Excellence, conducts a comprehensive assessment of a home's energy efficiency and provides recommendations for improvement. This program is aimed at raising consumer awareness of the benefits of energy efficiency and identify and prioritize energy efficiency upgrades.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	Existing Furnace Fan	Electric Heat Customers	
Efficient technology:	Efficient Furnace Fan/Improve Bldg Envelope	Fuel Switching to Gas/Various Efficiencies	
Number of participants or units delivered:	158	4	
Measure life (years):	18	18	

B. TRC Results:

TRC Benefits (\$):	\$	48,780.13
TRC Costs (\$):	\$	30,000.00
	Utility program cost (less incentives):	\$ 30,000.00
	Participant cost:	\$ -
	Total TRC costs:	\$ 30,000.00
Net TRC (in year CDN \$):	\$	18,780.13
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$	1.63

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

Conservation Programs:

Demand savings (kW):	Summer		1
	Winter		8
		lifecycle	in year
Energy saved (kWh):	1193400		66300
Other resources saved :			
	Natural Gas (m3):		
	Other (specify):		

Demand Management Programs:

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

Demand Response Programs:

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

Power Factor Correction Programs:

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

Line Loss Reduction Programs:

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

Distributed Generation and Load Displacement Programs:

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

Other Programs (specify):

Metric (specify):	
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Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. **Name of the Program:** 1. Residential Energy Efficiency Project (REEP)

D. **Program Costs*:**

<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i>	
	<i>Incremental O&M:</i>	\$ 30,000.00
	<i>Incentive:</i>	
	<i>Total:</i>	
<i>Utility indirect costs (\$):</i>	<i>Incremental capital:</i>	
	<i>Incremental O&M:</i>	
	<i>Total:</i>	
<i>Participant costs (\$):</i>	<i>Incremental equipment:</i>	
	<i>Incremental O&M:</i>	
	<i>Total:</i>	

E. **Comments:**

Please be advised that these are preliminary average estimates; more detailed figures were not available in time for this filing. The actual figures will be provided in future filings.

*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 2. Energy Efficient Traffic Lights and Street Lighting

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

Waterloo North Hydro, along with Cambridge and North Dumfries Hydro and Kitchener-Wilmot Hydro, have proposed to partially fund the replacement of incandescent bulbs with LED bulbs in the traffic lights throughout the Region of Waterloo. This program will result in significant energy savings as LED lights use 80 to 90% less electricity. It will also reduce maintenance costs as the LED bulbs last longer and are more visible. Waterloo North Hydro has proposed to work with the municipalities in our service area (principally in the rural areas and some villages of the township) to fund the replacement of old street light fixtures with energy efficient high-pressure sodium (HPS) streetlights.

Measure(s):

Measure 1 Measure 2 (if applicable) Measure 3 (if applicable)

Base case technology:

Efficient technology:

Number of participants or units delivered:

Measure life (years):

B. TRC Results:

TRC Benefits (\$):

TRC Costs (\$):

Utility program cost (less incentives):

Participant cost: \$

Total TRC costs:

Net TRC (in year CDN \$):

\$

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

#DIV/0!

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

Conservation Programs:

Demand savings (kW):

Summer

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):

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:

Other Programs (specify):

Metric (specify):

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. **Name of the Program:** 2. Energy Efficient Traffic Lights and Street Lighting

D. **Program Costs*:**

<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i> <i>Incremental O&M:</i> <i>Incentive:</i> <i>Total:</i>	
<i>Utility indirect costs (\$):</i>	<i>Incremental capital:</i> <i>Incremental O&M:</i> <i>Total:</i>	
<i>Participant costs (\$):</i>	<i>Incremental equipment:</i> <i>Incremental O&M:</i> <i>Total:</i>	

E. **Comments:**

The Regional Municipality of Waterloo has approved the traffic light program and is currently preparing tender documents and anticipates commencement of the traffic light project in the spring of 2006. WNH also has had an ongoing dialogue with the Townships of Wellesley and Woolwich and is working at their level in order to commence the street light project.

*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 3. Loss Reduction on the Distribution System

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

Waterloo North Hydro will investigate and install technologies that will reduce losses on the distribution system. These technologies include the deployment of capacitor banks, voltage conversion programs and upgrading of old transformers to new low loss transformers. All of these programs will help reduce distribution system losses and will reduce the system demand. These reductions will benefit all customers and will effect permanent changes that are not reliant on sustained changes in customer consumption.

Measure(s):

Measure 1

Measure 2 (if applicable)

Measure 3 (if applicable)

Base case technology:

Efficient technology:

Number of participants or units delivered:

Measure life (years):

B. TRC Results:

TRC Benefits (\$):

TRC Costs (\$):

Utility program cost (less incentives):

Participant cost: \$ -

Total TRC costs:

Net TRC (in year CDN \$): \$ -

Benefit to Cost Ratio (TRC Benefits/TRC Costs): #DIV/0!

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

Conservation Programs:

Demand savings (kW):

Summer

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):

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:

Other Programs (specify):

Metric (specify):

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. **Name of the Program:** 3. Loss Reduction on the Distribution System

D. **Program Costs*:**

<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i>	\$
	<i>Incremental O&M:</i>	\$
	<i>Incentive:</i>	\$
	<i>Total:</i>	\$

<i>Utility indirect costs (\$):</i>	<i>Incremental capital:</i>	\$
	<i>Incremental O&M:</i>	\$
	<i>Total:</i>	\$

<i>Participant costs (\$):</i>	<i>Incremental equipment:</i>	\$
	<i>Incremental O&M:</i>	\$
	<i>Total:</i>	\$

E. **Comments:**

This program was not started at December 31, 2005. Resources were allocated in 2005 to the Smart Metering Initiative. Work commenced in 2006 installing the capacitor banks.

*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 4. Smart Metering Pilot Project

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

Waterloo North Hydro has proposed a pilot project to install approximately 1500 metering locations to be retrofitted with smart meters for single-phase customers less than 50 kW demand (mostly residential) in conjunction with the Ministry's Smart Meter Initiative. This project will support the Ministry of Energy commitment to deploy Smart Meters and is a technology that will enable behavioural changes in conservation and demand management.

Measure(s):

Measure 1

Measure 2 (if applicable)

Measure 3 (if applicable)

Base case technology:

Efficient technology:

Number of participants or units delivered:

Measure life (years):

B. **TRC Results:**

TRC Benefits (\$):

TRC Costs (\$):

Utility program cost (less incentives):

Participant cost: \$ -

Total TRC costs:

Net TRC (in year CDN \$): \$ -

Benefit to Cost Ratio (TRC Benefits/TRC Costs): #DIV/0!

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

Conservation Programs:

Demand savings (kW):

Summer

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):

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:

Other Programs (specify):

Metric (specify):

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. **Name of the Program:** 4. Smart Metering Pilot Project

D. **Program Costs*:**

<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i>	\$ 5,128.00
	<i>Incremental O&M:</i>	
	<i>Incentive:</i>	
	<i>Total:</i>	
<i>Utility indirect costs (\$):</i>	<i>Incremental capital:</i>	
	<i>Incremental O&M:</i>	
	<i>Total:</i>	
<i>Participant costs (\$):</i>	<i>Incremental equipment:</i>	
	<i>Incremental O&M:</i>	
	<i>Total:</i>	

E. **Comments:**

WNH has been heavily involved in the OUSM project in 2005. The funds spent were for a Consultant's Report; however, the project had been put on hold in 2005 with the announcement of Government's Bill 21. Recent announcements have clarified a portion of the situation, however, further definition of the roles and responsibilities of the Smart Meter Entity are needed for WNH to commence the Smart Meter Pilot Program in 2006.

*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. **Name of the Program:** 5. Geothermal Energy Program

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

Waterloo North Hydro has proposed to invest seed money into a local initiative that will promote the installation of geothermal systems for residential customers by funding the initial capital costs and then obtain repayment for the capital costs from the energy savings that the customer will be expected to see on their electricity bill. This initiative will encourage fuel switching from electricity as a heating and cooling source. Waterloo North Hydro see this as a more permanent and sustainable reduction in demand on the electricity energy supply as well as being a form of distributed energy sources.

Measure(s):	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:			
Efficient technology:			
Number of participants or units delivered:			
Measure life (years):			

B. **TRC Results:**

TRC Benefits (\$):	
TRC Costs (\$):	
Utility program cost (less incentives):	
Participant cost: \$	-
Total TRC costs:	
Net TRC (in year CDN \$):	\$ -
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	#DIV/0!

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

Conservation Programs:

Demand savings (kW):	Summer	
	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):		
	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:	

Other Programs (specify):

Metric (specify):	
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Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 5. Geothermal Energy Program

D. **Program Costs*:**

Utility direct costs (\$):	Incremental capital:	
	Incremental O&M:	
	Incentive:	
	Total:	
Utility indirect costs (\$):	Incremental capital:	
	Incremental O&M:	
	Total:	
	Participant costs (\$):	Incremental equipment:
Incremental O&M:		
Total:		

E. **Comments:**

The Joint Venture Company was established in December 2005. This has resulted in the formal launch of the company Lifetime Energy Inc. in early 2006. Geothermal Installation Services are actively offered to customers at this time with installations to begin in the 2006 spring construction season.

*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 6. Energy Audits for Industrial, Commercial and Institutional Customers

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

Waterloo North Hydro recognizes that we need to work with our customers to keep them successful in business if we are to retain them as viable successful customers. Energy Audits for Industrial, Commercial and Institutional customers will help these customers to shift load from peak times and to find ways to conserve energy. We propose to partner with a local Energy Audit Services provider to deliver audits to our customers. Waterloo North Hydro will investigate methods to promote to our customers the use of Energy Audits and the implementation of the recommendations from Energy Audits. This program is aimed at consumer awareness and education at the business and institutional level and should encourage behavioural and operational changes that will reduce demand and conserve energy.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:			
Efficient technology:			
Number of participants or units delivered:			
Measure life (years):			

B. TRC Results:

TRC Benefits (\$):	
TRC Costs (\$):	
Utility program cost (less incentives):	
Participant cost: \$	
Total TRC costs:	
Net TRC (in year CDN \$):	
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	#DIV/0!

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

Conservation Programs:

Demand savings (kW):	Summer		
	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):	
	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:	

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. **Name of the Program:** 6. Energy Audits for Industrial, Commercial and Institutional Customers
Other Programs (specify):
Metric (specify):

D. **Program Costs*:**

<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i>	
	<i>Incremental O&M:</i>	
	<i>Incentive:</i>	
	<i>Total:</i>	
 <i>Utility indirect costs (\$):</i>	 <i>Incremental capital:</i>	
	<i>Incremental O&M:</i>	
	<i>Total:</i>	
 <i>Participant costs (\$):</i>	 <i>Incremental equipment:</i>	
	<i>Incremental O&M:</i>	
	<i>Total:</i>	

E. **Comments:**
 This program was not started at December 31, 2005. WNH is working with Cambridge and North Dumfries Hydro and Kitchener-Wilmot Hydro to present the Cool Shops Program to customers in the Region of Waterloo. This Program will be launched in 2006.

*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 7. Low Income Customer Retrofit Program

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

WNH works with the Region of Waterloo's Regional Social Services to identify and implement energy efficiency programs for Heat Bank (low income program) and other Low income Customers. These programs may include home energy assessments and will look at retrofit programs for such items as occupancy sensor thermostats, lower wattage stove elements, weatherstripping, compact fluorescent light bulbs and efficient showerheads. The retrofit items will be installed for the customer. This project is aimed at raising awareness of the benefits of energy efficiency and energy-cost savings for low-income consumers.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	Replace 60W incandescent bulb	Install low flow showerhead	Install weatherstripping
Efficient technology:	15 W compact fluorescent bulb	9.4 litre/minute low flow showerhead	Weatherstripping
Number of participants or units delivered:	15	3	3
Measure life (years):	4	12	25

B. TRC Results:

TRC Benefits (\$):	\$	2,658.83
TRC Costs (\$):		
Utility program cost (less incentives):	\$	3,000.00
Participant cost:	\$	-
Total TRC costs:	\$	3,000.00
Net TRC (in year CDN \$):	-\$	341.17
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	\$	0.89

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

Conservation Programs:

Demand savings (kW):	Summer	0
	Winter	1
	lifecycle	in year
Energy saved (kWh):	58491	4320
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 (%):	

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. **Name of the Program:** 7. Low Income Customer Retrofit Program

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: _____

Other Programs (specify):

Metric (specify): _____

D. **Program Costs*:**

<i>Utility direct costs (\$):</i>	<i>Incremental capital:</i>	_____
	<i>Incremental O&M:</i>	\$ _____ 3,000.00
	<i>Incentive:</i>	_____
	<i>Total:</i>	_____

<i>Utility indirect costs (\$):</i>	<i>Incremental capital:</i>	_____
	<i>Incremental O&M:</i>	_____
	<i>Total:</i>	_____

<i>Participant costs (\$):</i>	<i>Incremental equipment:</i>	_____
	<i>Incremental O&M:</i>	_____
	<i>Total:</i>	_____

E. **Comments:**

Please be advised that these are preliminary average estimates, more detailed figures were not available in time for this filing. The actual figures will be provided in future filings. Please also note that only 10% of the committed funds were spent in 2005.

*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program: 8. Energy Conservation Information for Consumers

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

Waterloo North Hydro currently has a website that has some information on energy conservation for homeowners. We are working with a website developer to update our website to provide easier access to more information on energy efficiency and link to other websites. Waterloo North Hydro will also invest in providing brochures educating and promoting energy efficiency.

Measure(s):

Measure 1

Measure 2 (if applicable)

Measure 3 (if applicable)

Base case technology:

Efficient technology:

Number of participants or units delivered:

Measure life (years):

B. TRC Results:

TRC Benefits (\$):

TRC Costs (\$):

Utility program cost (less incentives):

Participant cost: \$

Total TRC costs:

Net TRC (in year CDN \$):

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

#DIV/0!

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

Conservation Programs:

Demand savings (kW):

Summer

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):

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:

Other Programs (specify):

Metric (specify):

Appendix B - Discussion of the Program

(complete this section for each program)

WATERLOO NORTH HYDRO INC.

A. Name of the Program:	8. Energy Conservation Information for Consumers
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D. Program Costs*:													
<i>Utility direct costs (\$):</i>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><i>Incremental capital:</i></td> <td style="width: 30%;"></td> <td style="width: 40%;"></td> </tr> <tr> <td><i>Incremental O&M:</i></td> <td style="text-align: right;">\$</td> <td style="text-align: right;">17,065.00</td> </tr> <tr> <td><i>Incentive:</i></td> <td></td> <td></td> </tr> <tr> <td><i>Total:</i></td> <td></td> <td></td> </tr> </table>	<i>Incremental capital:</i>			<i>Incremental O&M:</i>	\$	17,065.00	<i>Incentive:</i>			<i>Total:</i>		
<i>Incremental capital:</i>													
<i>Incremental O&M:</i>	\$	17,065.00											
<i>Incentive:</i>													
<i>Total:</i>													
<i>Utility indirect costs (\$):</i>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><i>Incremental capital:</i></td> <td style="width: 30%;"></td> <td style="width: 40%;"></td> </tr> <tr> <td><i>Incremental O&M:</i></td> <td></td> <td></td> </tr> <tr> <td><i>Total:</i></td> <td></td> <td></td> </tr> </table>	<i>Incremental capital:</i>			<i>Incremental O&M:</i>			<i>Total:</i>					
<i>Incremental capital:</i>													
<i>Incremental O&M:</i>													
<i>Total:</i>													
<i>Participant costs (\$):</i>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><i>Incremental equipment:</i></td> <td style="width: 30%;"></td> <td style="width: 40%;"></td> </tr> <tr> <td><i>Incremental O&M:</i></td> <td></td> <td></td> </tr> <tr> <td><i>Total:</i></td> <td></td> <td></td> </tr> </table>	<i>Incremental equipment:</i>			<i>Incremental O&M:</i>			<i>Total:</i>					
<i>Incremental equipment:</i>													
<i>Incremental O&M:</i>													
<i>Total:</i>													

E. Comments:	<p>Waterloo North Hydro purchased energy efficiency brochures in 2005, however they were not distributed until 2006, thus no measurable savings could be achieved.</p>
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*Please refer to the TRC Guide for the treatment of equipment cost in the TRC Test.