Hamilton Hydro Inc.

HAMILTON HYDRO INC.

a Hamilton Utilities company

Conservation and Demand Management Plan

Ontario Energy Board File No. RP-2004-0203

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Introduction

Ontario's Minister of Energy has authorized electricity distributors to apply to the Ontario Energy Board (Board) for 2005 rate implementation of their third installment of market adjusted revenue requirement (MARR), on the condition that an equivalent amount of incremental revenue be invested by those distributors in conservation and demand management activities. In a letter dated May 31 2004 to electricity distributors, the Minister identified some of the activities that might be included in a distributor's Conservation and Demand Management Plan, including:

- 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.

Hamilton Hydro's Conservation and Demand Management (CDM) Plan has been developed within the context of the Minister of Energy's May 31, 2004 letter and the procedural order issued by the Board.

Hamilton Hydro Inc. hereby requests the Board's approval of and final order authorizing its CDM plan as being appropriate and effective in discharging its CDM investment obligation, subject to issuance in due course of an order for distribution rates including the final tranche of the market adjusted revenue requirement (MARR).

Plan Budget and Assumptions

Hamilton Hydro's third MARR installment is approximately $5.2 million, exclusive of any payments in lieu of taxes.

Through a letter accompanying its Preliminary Guidelines for Electricity Distributor Conservation and Demand Management Activities, the Board has authorized that distributor conservation and demand management spending may be spread over a three-year window to September 30 2007.

Hamilton Hydro's Conservation and Demand Management Plan is therefore based on investing approximately $5.2 million in a combination of capital and operating expenses during the period from January 1, 2004 to September 30 2007.

The implementation of this plan will require re-deployment of some existing personnel. Costs associated with the CDM including the use of existing resources have been allocated to the programs detailed in this plan, and are provided for in the annual budget figures.

While the current plan is well balanced, it is recognized that the industry and regulatory framework is dynamic. Hamilton Hydro will continue to assess and update its plan as new opportunities are presented. If necessary, Hamilton Hydro will re-allocate funds between programs to respond to customer demand levels. However, Hamilton Hydro will make best efforts to achieve the target levels of capital and operating expenditures by year.

Objectives

The Province of Ontario is facing serious challenges in meeting its future electricity needs. Energy conservation and demand management has been identified as one of the most viable and cost-effective means of meeting the province's energy needs in the short term.

The Minister of Energy has called for the creation of a 'Conservation Culture' in the province, and has established two important objectives for the electricity sector and electricity consumers. First, he has targeted a reduction in Ontario's demand for electricity by 5% by 2007. Second, he has committed to the installation of 800,000 SMART electricity meters by 2007, and the full deployment of SMART meters for all electricity consumers by 2010.

The objective of this plan is to contribute to the emergence of a conservation culture in Ontario and, more specifically, to support the Minister's commitments to peak demand reduction and SMART meter installations.

Strategy

In developing this plan, the following criteria were used to guide the selection of component programs:

i. Allocation of Benefits – The overall plan should distribute benefits broadly to Hamilton Hydro's customers.

ii. Certainty of Achieving Targeted Benefits – Preference was given to investments that offer more predictable results.

iii. Leveraging Partnerships – Partnerships will be sought to deliver 'behind the meter' programs that will benefit from greater scale for cost-effective implementation.

Programs

Conservation and Demand Management (CDM)

Residential and Small Commercial (< 50 KW)

Co-branded Mass Market Program

Description

This flagship co-branded mass-market program (e.g. *powerWISE*™) is a multifaceted approach to fostering the conservation culture in Ontario. Through development of a significant cooperative effort amongst six of the largest municipal LDC's, this program will become synonymous with specific initiatives such as Compact Fluorescent Lighting (CFL) change out programs, LED Christmas Lights, Energy Star, Multi-Choice, energy audits, water heater blanket wraps, school based education and a host of other programs aimed at providing customers tools and education to reduce their energy usage. Access to online services such as energy consumption calculators, an energy expert, and personalized energy audit services are contemplated as components of this program.

Target users

Mass-market including residential and small commercial

Benefits

Increased awareness, improved product supply, culture shift, and significant demand and energy reductions.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$130	$160	$235	$525
Capital Expenditures	$0	$0	$0	$0
Totals	$130	$160	$235	$525

SMART Meter/Prepayment Meter Pilot

Description

A pilot program for residential SMART meters and Prepayment Meters will be deployed to enable the assessment of metering, communications, settlement and other technologies that may be used to accommodate the universal application of SMART meters in the future. Further, sub-metering opportunities for the purposes of customer information in a bulk-metered situation (i.e. condominiums) may be considered.

It has been demonstrated that pay as you go meters reduce a consumer's load by 15%. This is the result of the greater interaction required by this technology. While we assume this will be attractive to our 750 kWh hour a month residential customers the result is desirable. We see this pilot as a turning point as it brings us to the critical mass required to make this a standard product in the Ontario market.

These initiatives will commence upon the release of a formal definition of a SMART meter by the Board.

Target users

Residential and small commercial customers

Benefits

This program supports the Minister of Energy's commitment to the installation of 800,000 SMART meters across Ontario by 2007. It will provide Hamilton Hydro with the experience and knowledge needed to efficiently expand the use of SMART meters over the next several years.

In conjunction with appropriate rate structures, the program will also provide customers participating in the pilot programs with an incentive to conserve or shift energy use.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$110	$80	$90	$280
Capital Expenditures	$470	$850	$0	$1,320
Totals	$580	$530	$490	$1,600

Energy Audit Program

Description

Through visits to customers homes or by working through existing service providers Hamilton Hydro will provide conservation information and make specific recommendations for energy savings in such areas as major appliances, lighting, air leakage, hot water, heating and cooling. Incentives may also be provided. Services could be further tailored for specific social housing applications. Hamilton Hydro will develop an on-line energy audit program allowing customers to complete their own audits and receive advise on reducing their energy consumption at no cost to the consumer.

Target users

Residential and small commercial customers

Benefits

The consumer receives a clear, concise and prioritized report identifying opportunities for energy savings as well as the associated costs and payback period (as applicable).

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$80	$80	$80	$240
Capital Expenditures	$0	$0	$0	$0
Totals	$80	$80	$80	$240

Social Housing Program

Description

A province wide centralized energy management service for the social housing sector will be developed in collaboration with the Provincial Government, utilities (e.g. Enbridge, Union Gas) and others such as the Share The Warmth initiative.

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

Target users

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

Benefits

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

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$75	$75	$75	$225
Capital Expenditures	$0	$0	$0	$0
Totals	$75	$75	$75	$225

Commercial, Industrial and Institutional (> 50 KW)

Smart Meter Program

Description

Hamilton Hydro will expand the use of SMART or interval meters to include commercial industrial and institutional customers greater than 50 kW.

This program will commence upon the release of a formal definition of a SMART meter by the Board.

Target users

Commercial, Industrial and Institutional customers

Benefits

This program supports the Minister of Energy's commitment to the installation of 800,000 SMART meters across Ontario by 2007. These meters are seen as an important means of establishing a 'conservation culture' in Ontario. In conjunction with appropriate rate structures, they will encourage customers to conserve or shift energy use.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$25	$50	$0	$75
Capital Expenditures	$100	$275	$0	$375
Totals	$125	$325	$0	$450

Energy Audits and Feasibility Studies

Description

A standard energy audit will be developed to assist in completion of audits. As well, a training program tailored to this specific sector will allow companies with a certified employee or outside consultants to perform the audit. Any cross-linkages with the residential audit project will be accessed where feasible. Strategic partnerships will be analyzed for incentives or other synergies. The audit model will be developed, tested and refined in co-operation with partners that will be involved with training, certification, and management of the process. This standard checklist or procedure will be duplicated where possible.

Target users

Large consumers over 50 kW including schools, large commercial facilities, institutional facilities, industrial, and municipal facilities like recreation centres, arenas, and libraries.

Benefits

Include increased awareness, skills development, benchmarking energy data, establishing best practices, fostering the conservation culture within this sector and significant reductions in demand and energy consumption.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$30	$30	$30	$90
Capital Expenditures	$0	$0	$0	$0
Totals	$30	$30	$30	$90

LED Retrofits for Traffic Lights

Description

This initiative involves replacing traffic signals at intersections to light-emitting diode (LED) technology, which is now fairly common in many U.S. municipalities.

Target users

Municipalities

Benefits

This program results in significant energy savings since the LED technology uses approximately 80% less electricity. Other benefits include reduced maintenance (LED's last longer) and improved visibility.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$20	$20	$20	$60
Capital Expenditures	$0	$0	$0	$0
Totals	$20	$20	$20	$60

Leveraging Energy Conservation and/or Load Management Programs

Description

Existing energy conservation and/or load management programs such as NRCan's Energy Innovators and Enbridge Initiatives will be promoted and incentives may be provided to advance market uptake of these programs and implementation of the recommendations. The LDC's are well positioned to introduce such programs to their customer base such as the MUSH sector. Work will be conducted with the existing program providers to maximize leverage opportunities. Promotion will potentially include face-to-face meetings, conferences and seminars.

Target users

Large consumers over 50 kW including schools, large commercial facilities, institutional facilities, industrial, and municipal facilities

Benefits

Customer awareness and additional incentives will help to advance market uptake of audit services, feasibility studies and retrofit opportunities.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$50	$50	$50	$150
Capital Expenditures	$25	$25	$25	$75
Totals	$75	$75	$75	$225

Load Control Initiative

Description

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

Target Users

Larger commercial, industrial and institutional customers

Benefit

Demand control provides lower costs and Increased stability for customers and utilities.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$40	$40	$40	$120
Capital Expenditures	$160	$160	$160	$480
Totals	$200	$200	$200	$600

Distribution Loss Reduction

Distribution Loss Reduction

Description

The Distribution Loss Program is a broad network based initiative to drive greater efficiencies within the distribution grid. This program will identify opportunities for system enhancements. Next steps will be to complete the engineering analysis and feasibility studies. Projects will be prioritized and selected based on the most attractive investment to results ratio. Items to be addressed may include, but are not limited to:

Power Factor Correction - Under the Power Factor Correction initiative, a power factor assessment will be completed which will identify locations for the installation of power factor correction capacitor banks. The results and available funding will determine which projects proceed.

Voltage Conversion - Voltage upgrades can save up to 90% of the losses associated with a feeder as higher voltages and lower current results in lower losses. This study will ascertain the locations and value of voltage conversions. This program could also involve changing out all the meters on a particular feeder to Smart Meters so that the exact losses can be determined.

Power System Optimization Study - This program is an engineering study to ascertain where load shifting can occur within the grid to improve system efficiency including the location of optimized "open points". It is estimated that approximately 5% - 10% of system losses could be saved.

Voltage Profile Management - Changing voltage profiles at the distribution station level can result in as much as a 3% peak reduction at the controllable distribution stations. This is in addition to the IMO's voltage reduction program and will not interfere with the effectiveness of that program.

Line Loss Reductions - Replacement of conductor such as #6 AWG copper with #2 AWG aluminium will reduce line losses. An evaluation of where such opportunities may exist may be undertaken. The results and available funding will determine which projects proceed.

Transformer and Other Losses – Using infrared scans of transformers this program will help to identify additional electricity losses including overloaded equipment. "Hot" transformers will be investigated further to determine operational improvement opportunities.

Target users

The results of this program will positively impact all of Hamilton Hydro's customers.

Benefits

Benefits include cost savings and efficiencies for all, as existing system loss costs are shared by all customers. As losses are reduced, costs of running the grid will also be reduced.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$40	$40	$40	$120
Capital Expenditures	$205	$200	$160	$565
Totals	$245	$240	$200	$685

Distributed Energy

Load Displacement

Description

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

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

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

Target users

Commercial, industrial, residential, schools, colleges and universities

Benefits

Benefits include additional capacity within the grid. Cleaner technologies result in reductions in GHG emissions. Other benefits include improved system reliability, reduced harmonics, and backup power possibilities, education and skills development.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$70	$85	$150	$305
Capital Expenditures	$0	$80	$75	$155
Totals	$70	$165	$225	$460

Stand-by Generators

Description

This program may provide for the use of customers' existing standby generators when required and/or economical. Environmentally friendly generators will be the focus of this initiative.

Target Users

Commercial and industrial customers with sufficiently sized stand-by generators

Benefits

Reduction of customer's and system peak This additional supply may be able to bid into the Ontario energy market in the future.

Budget

$K	2004/05	2006	2007	Totals
Operating Expense	$30	$0	$0	$30
Capital Expenditures	$50	$0	$0	$50
Totals	$80	$0	$0	$80

Conclusion

Hamilton Hydro believes that the plan set out in this document is a prudent and effective approach in helping to achieve the Province's energy conservation and demand management goals. This plan addresses many of the potential initiatives outlined in the Minister's letter and represents a responsible first step in Hamilton Hydro's implementation of CDM programs.

Hamilton Hydro looks forward to the Board's approval of this plan and the implementation of these initiatives. Hamilton Hydro requests that in the Board's Decision granting approval of Hamilton Hydro's CDM Plan, the Board confirm that the approved plan will discharge Hamilton Hydro's obligation to invest an amount equivalent to it's third tranche MARR, subject to *ex post* review by the Board only with respect to planned versus actual CDM spending.

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Program Budget and Timeline Summary

The following spreadsheet provides an overall summary of funding and timelines for the suite of Hamilton Hydro's Conservation and Demand Management Programs.

Program	Expense	Budget (x k)			Total
		2004-05	2006	2007	Cost
Conservation and Demand Management	OPEX	560	585	620	4,015
	CAPEX	755	1,310	185	
Distribution Loss Reduction	OPEX	40	40	40	685
	CAPEX	205	200	160	
Distributed Energy	OPEX	100	90	150	540
	CAPEX	50	75	75	
Totals		**1,700**	**1,915**	**1,610**	**5,240**