Report to:

ONTARIO ENERGY BOARD

PUC Distribution Inc.
RP-2004-0203\EB-2004-0458
Conservation and Demand Annual Report

Document No. 06PUC01-REP-R0001-02

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PUC DISTRIBUTION INC.
RP-2004-0203\EB-2004-0458
CONSERVATION AND DEMAND ANNUAL REPORT
06PUC01-REP-R001-02

MARCH 2006

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REVISION HISTORY

REV. NO	ISSUE DATE	PREPARED BY AND DATE	REVIEWED BY AND DATE	APPROVED BY AND DATE	DESCRIPTION OF REVISION
0	24/03/06	R. Reid			Initial Draft for Review
1	30/03/06	R. Reid	J. Uchmanowicz	A. Frederick	Final Draft for Review
2	31/03/06	R. Reid	J. Uchmanowicz	A. Frederick	Approved for Issue to OEB

TABLE OF CONTENTS

PUC DISTRIBUTION INC.
RP-2004-0203\EB-2004-0458
CONSERVATION AND DEMAND ANNUAL REPORT

1.0 INTRODUCTION

This report represents the submission of PUC Distribution Inc. (ED-2002-0546) for the year 2005. This represents the first year of a three year plan that was approved by the Ontario Energy Board in its Final Order in proceeding RP-2004-0203/EB-2004-0458. The amount of $886,854 was approved as the three year budget for this program.

As a requirement of the Final Order, PUC Distribution Inc. is required to apply to the Board for approval if cumulative fund transfers between programs exceed 20% of the approved budget. No transfers between programs in 2005 exceeded 20% of the budget.

2.0 EVALUATION OF THE C&DM PLAN

N-Sci Technologies Inc. has undertaken an evaluation of the PUC Distribution Inc. C&DM Plan as part of its responsibilities in preparing this report. As required by the Board, a hard copy of the Board's spreadsheet is attached.

See Section 6 for the appendices containing the spreadsheets that were provided by the Ontario Energy Board.

3.0 DISCUSSION OF THE PROGRAMS

3.1 UTILITY ASSET CONSERVATION PROGRAM

The Utility Asset Conservation Program is a broad network based initiative to drive greater efficiencies within the distribution grid. The program will identify and implement opportunities for system enhancements. Engineering analysis and feasibility studies will be conducted in order that projects can be prioritized and selected based on the most attractive investment to results ratio.

Voltage conversion was a specific focus of the first year of the overall program. A considerable amount of the overall program spending occurred in this one initiative. An estimate was previously prepared that outlined the overall savings to the LDC from voltage conversion. The savings for this initiative, which is a portion of the total, were calculated using a ratio of converted line to total line that required conversion. In order to keep the benefit calculation conservative and to reduce the overall cost of analysis, only energy savings were considered. While the physical work to convert the facilities was completed in 2005, the higher voltage will not be in operation until 2006. Therefore, the benefits outlined in the appendix are the expected savings that will result when the higher voltage is put into operation in 2006.

3.2 CUSTOMER CONSERVATION PROGRAM

This program is intended to provide demand side management and demand response programs for residential and small commercial customers. It includes pilot projects that are designed to assess the benefits of a specific DSM measure before a significant investment is made to introduce the measure on a large scale. Specific programs directed at low income and senior residential customers will also be initiated.

Two pilot projects have been identified for 2005. One involves the assessment of heat storage units for electrically heated residences and small commercial facilities. The other pilot project will assess the benefits of using broadband over powerline technology to collect and provide market prices and consumption information for customers and the integration of smart meters with the network, and allow for remote management of electrical appliances and equipment to reduce or shift electrical demand.

The first year of the program dealt with the initiation of two pilots but the results were not completed by the end of 2005. More detailed reporting on these initiatives will come in future reports.

3.3 EDUCATION AND INFORMATION:

Programs will be developed that focus on community and specific customer information to foster an energy conservation culture.

Programs and initiatives could include the following:

- The ability for customers to access their usage information by consumption and cost on an up to date basis as smart meters are implemented. This will require changes to customer information systems and hardware to allow access to information at a host site or the customer site.
- Tools could be developed such as energy calculators, energy profiling, timely customer communication based on established consumption or cost parameters and conservation tips.
- Energy conservation forums will be presented for specific customer categories.
- School programs will be implemented building on the successful “Caution and Chance” safety program.

The specific initiatives under this program are still being designed.

3.4 PARTNERSHIP PROGRAMS:

Alliances will be formed with other organizations delivering or promoting energy efficient services and products. This will allow leveraging energy conservation resources for program delivery.

Partnership opportunities will be developed with organizations such as:

- Other local distribution companies for development of energy tools, common marketing and communication initiatives and information.
- Government and non profit sectors for funding, research, and delivery or promoting of their specific programs.
- Suppliers of DSM products and services to take advantage of joint marketing programs.

In order to ensure these opportunities realized the largest benefit for the LDC’s expenditures, 2005 was used to investigate many options prior to entering into alliances or agreements.

3.5 PLANNING AND COORDINATION:

Monitoring and evaluation of the Conservation and DM plan are necessary to ensure that the programs proceed according to plan, that standard evaluation mechanisms are in place and that the plan is refined or modified as required to meet stated objectives.

Coordination is required amongst distribution companies that file jointly and share resources as well as with partnerships that are developed.

Tracking and reporting of the various programs will be required to support prudence review of expenditures by the Ontario Energy Board.

Program research will be conducted to prioritize energy conservation programs, program benefit measurement, benchmarks and return, and the documentation of the findings. Research opportunities in the short term will focus on technologies in the areas of broadband over powerline, load control devices, reducing distribution system losses, and energy conservation tools.

4.0 LESSONS LEARNED

Given the vast array of options for program design and delivery that are available to LDCs, it has become clear that focusing on the specific needs and demographics of the LDC's customers will create the best advantages for all involved.

The need to partner with other organizations providing energy efficient services and products is evident and this approach will leverage the LDC's funds to the greatest extent possible. The main benefits from this approach are: reduced development costs, increased delivery timing, lack of duplication through information sharing and increased buying power.

5.0 CONCLUSIONS

After reviewing the various program documents, N-Sci Technologies Inc. is confident that the objectives of the original plan that was filed with the Ontario Energy Board are being followed. The prudent review of numerous alternatives has lead to a good mix of initiatives that will benefit both the LDC and its customers.

This report represents the first report on the first year of a three year program. The overall level and prioritization of spending is in line with standard utility practices in the areas of conservation and demand management.

The reporting requirements have been met as outlined in the Ontario Energy Board's "Guideline for Annual Reporting of CDM Initiatives".

6.0 APPENDICES

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6.1 APPENDIX A – EVALUATION OF THE C&DM PLAN

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Appendix A - Evaluation of the CDM Plan

	Total	Residential	Commercial	Institutional	Industrial	Agricultural	LDC System	Other 1	Other 2	Other 3	Other 4	Other 5
Net TRC value ($):	*$154,053*						$ 252,234.00		-$ 77,234.00	-$ 5,876.00	-$ 3,640.00	-$ 11,431.00
Benefit to cost ratio:	*1.42*						1.94		0.00	0.00	0.00	0.00
Number of participants or units delivered:												
Total KWh to be saved over the lifecycle of the plan (kWh):	*12,371,700*						12,371,700					
Total in year kWh saved (kWh):	*618,585*						618,585					
Total peak demand saved (kW):	*N/A*						N/A					
Total kWh saved as a percentage of total kWh delivered (%):	*0.1%*						0.1%					
Peak kW saved as a percentage of LDC peak kW load (%):	*N/A*											
Gross in year C&DM expenditures ($):	*$367,467*						$ 269,286.00		$ 77,234.00	$ 5,876.00	$ 3,640.00	$ 11,431.00
Expenditures per KWh saved ($/kWh):*	*0.5940*											
*Expenditures per KW saved ($/kW)**:*	*N/A*											

Utility discount rate (%):	7.67%

*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.

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6.2 APPENDIX B – DISCUSSION OF THE PROGRAM

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Appendix B - Discussion of the Program

A. **Name of the Program:** LDC System - Utility Asset Conversion

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

This program focused on line loss reduction on the feeders from substation #5. The main actions taken were to replace old, small conductor with larger conductor and increase the supply voltage for the feeder. This results in a distribution system with a standard conductor size and a standard voltage. The estimated losses on all of the feeders for a particular substation can be calculated. The actual savings are very difficult to calculate as the losses on a piece of a feeder that is upgraded is very difficult to calculate. In order to find a balance between accuracy and effort, the loss savings have been limited to energy only impacts while using a ratio method of total meters of line upgraded to total line in need of upgrade.

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):	20		

B. **TRC Results:**

TRC Benefits ($):			$521,520
TRC Costs ($):			
	Utility program cost (less incentives):	$	269,286.00
	Participant cost:	$	-
	Total TRC costs:	$	269,286.00
Net TRC (in year CDN $):		$	252,234.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):		$	1.94

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):		N/A
	lifecycle	*in year*
Energy savings (kWh):	12,371,700	618,585

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*:**

Utility direct costs ($):	*Incremental capital:*	$	269,286.00
	Incremental O&M:	$	-
	Incentive:	$	-
	Total:	$	269,286.00
Utility indirect costs ($):	*Incremental capital:*		0
	Incremental O&M:		0
	Total:		0
Participant costs ($):	*Incremental equipment:*		0
	Incremental O&M:		*0*
	Total:		0

E. Comments:

The facilities that were converted in 2005 will not be energized at the higher voltage until 2006. The savings indicated are the expected savings that will result from the conversion. The savings are conservative as the demand savings have not been included in the total. Only avoided energy costs have been used in the NPV model. Once the conversion is complete, the next report will include a more detailed analysis.

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Other 2 - Customer Conservation Program

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

There a two main aspects to this program that are still under development. A smart meter pilot utilizing Broadband over Powerline technology to collect customer information has been initiated but the results have not been collected. As well, an assessment of heat storage units for retrofit into electrically heated residences and small commercial establishments has been initiated. The ETS technology is being evaluated but the program has not be fully delivered and evaluated.

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):	$	77,234.00
Participant cost:	$	-
Total TRC costs:	$	77,234.00
Net TRC (in year CDN $):	-$	77,234.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	-

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 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. **Program Costs*:**

Utility direct costs ($):	*Incremental capital:*	$ -
	Incremental O&M:	$ 77,234.00
	Incentive:	$ -
	Total:	$ 77,234.00
Utility indirect costs ($):	*Incremental capital:*	0
	Incremental O&M:	0
	Total:	0
Participant costs ($):	*Incremental equipment:*	0
	Incremental O&M:	*0*
	Total:	0

E. Comments:

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Other 3 - Education and Information

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

This program is intended to provide information to consumers to foster a conservation culture. Several small initiatives have been completed but the program is still under development.

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):	$ 5,876.00
	Participant cost:	$ -
	Total TRC costs:	$ 5,876.00
Net TRC (in year CDN $):		-$ 5,876.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):		$ -

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 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. **Program Costs*:**

Utility direct costs ($):	*Incremental capital:*	$	-
	Incremental O&M:	$	5,876.00
	Incentive:	$	-
	Total:	$	5,876.00
Utility indirect costs ($):	*Incremental capital:*		0
	Incremental O&M:		0
	Total:		0
Participant costs ($):	*Incremental equipment:*		0
	Incremental O&M:		*0*
	Total:		0

E. Comments:

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Other 4 - Partnership Programs

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

This program was intended to leverage programs and services being developed or offered by other LDCs, government agencies, technology vendors and C&DM service providers. While numerous opportunities are being investigated, there has been little advancement in the first year of the program.

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):	$	3,640.00
Participant cost:	$	-
Total TRC costs:	$	3,640.00
Net TRC (in year CDN $):	-$	3,640.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	-

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:

	lifecycle	in year
Peak load savings (kW):		
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. **Program Costs*:**

Utility direct costs ($):	*Incremental capital:*	$ -
	Incremental O&M:	$ 3,640.00
	Incentive:	$ -
	Total:	$ 3,640.00
Utility indirect costs ($):	*Incremental capital:*	0
	Incremental O&M:	0
	Total:	0
Participant costs ($):	*Incremental equipment:*	0
	Incremental O&M:	*0*
	Total:	0

E. Comments:

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Other 5 - Planning and Co-ordination

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

This program collects the overall costs for planning and co-ordination of the entire program. There are no results that can be attributed as this is an administrative function for the entire program.

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):	$	11,431.00
Participant cost:	$	-
Total TRC costs:	$	11,431.00
Net TRC (in year CDN $):	-$	11,431.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	-

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:

	lifecycle	in year
Peak load savings (kW):		
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. **Program Costs*:**

Utility direct costs ($):	*Incremental capital:*	$ -
	Incremental O&M:	$ 11,431.00
	Incentive:	$ -
	Total:	$ 11,431.00
Utility indirect costs ($):	*Incremental capital:*	0
	Incremental O&M:	0
	Total:	0
Participant costs ($):	*Incremental equipment:*	0
	Incremental O&M:	*0*
	Total:	0

E. Comments:

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

Appendix A - Evaluation of the CDM Plan

	Total	Establish Baseline	Customer Awareness / Education	Non-Profit Housing	Co-Branding (Cold Water)	Smart Meters Residential	IMO Demand Response	System Optimization
Net TRC value ($):	$ 31,675.00	N/A	*$ 3,747.67*	N/A	$ 27,927.81	N/A	N/A	N/A
Benefit to cost ratio:	$ 15.85	N/A	$12.40	N/A	$ 3.45	N/A	N/A	N/A
Number of participants or units delivered:	*1660*	55	84	1	1320	200	7	n/a
Total KWh to be saved over the lifecycle of the plan (kWh):	*679910*	*N/A*	*63140*	*N/A*	*616770*	*N/A*	*N/A*	*N/A*
Total in year kWh saved (kWh):	*632555*	*N/A*	*15785*	*N/A*	*616770*	*N/A*	*N/A*	*N/A*
Total peak demand saved (kW):	*21*	*N/A*	*0*	*N/A*	*21*	*N/A*	*N/A*	*N/A*
Total kWh saved as a percentage of total kWh delivered (%):	*0.05%*	*N/A*	*0.0053*	*N/A*	*0.05%*	*N/A*	*N/A*	*N/A*
Peak kW saved as a percentage of LDC peak kW load (%):	*0.01%*	*N/A*	*N/A*	*N/A*	*0.0096*	*N/A*	*N/A*	*N/A*
Gross in year C&DM expenditures ($):	*$446,943*	$139,456	$1,073	none	$1,500	$156,312	$45,577	$103,025
Expenditures per KWh saved ($/kWh):*	$0.71	*N/A*	*N/A*	*N/A*	0.002432025	*N/A*	*N/A*	*N/A*
*Expenditures per KW saved ($/kW)**:*	$21,283	*N/A*	*N/A*	*N/A*	72.83602789	*N/A*	*N/A*	*N/A*

Utility discount rate (%):	8.57

Oshawa 2005 kWh=1,174,501,350

Oshawa Peak Demand =217.8 MW

*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)

A. **Name of the Program:** Residential - Establish Baselines and Measuring Impacts

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

To establish baselines to benchmark the measurement and analysis of future results that are to be submitted to the regulators. Baselines may apply to specific customer groups or they may be based on the penetration of identified energy efficient technologies.
Data capture is taking place through 55 "Smart meters" and will be analyzed based on connected loads, workings lifestyles, family size and several other categories.
This data has undergone a preliminary review and will be reviewed more in depth in conjunction with The University of Ontario Institute of Technology. There was a partnership with an outside technology supplier to assist in the meter installation.
Evaluation of the project continues as we test meter readings and accuracy. A baseline will continue to be developed throughout 2006.

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):	$ 139,456.00
Participant cost:	
Total TRC costs:	$ 139,456.00
Net TRC (in year CDN $):	
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	

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 begining of year (%):	
Distribution system power factor at end of year (%):	

Line Loss Reduction Programs:

	lifecycle	in year
Peak load savings (kW):		
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*:**

Utility direct costs ($):	*Incremental capital:*	$ -
	Incremental O&M:	$ 139,456.00
	Incentive:	
	Total:	
Utility indirect costs ($):	*Incremental capital:*	
	Incremental O&M:	
	Total:	
Participant costs ($):	*Incremental equipment:*	
	Incremental O&M:	
	Total:	

E. Comments:

Costs for both Residential and Commercial are included in here.

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Co-Branding With Other LDC's and Market Participants

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

Powerwise has recently been adopted as the mass market programming approach to foster the conservation culture in Ontario. This alliance will hopefully maximize economies of scale, and will continue to include incentives to the consumer such as Christmas lights, school based education and other programs aimed at customers to encourage their reduction of energy usage. We are currently investigating the costs to join the Powerwise branding process. We also delivered the cold water wash campaign flyer in our bills to promote the use of cold water washing.
Target users: All customers in the Oshawa service area.
Benefits: The benefits of this program will include increased awareness, improved product supply, culture shift and reduction of energy usage. It will also educate the customer on valuing the commodity.
Evaluation: None at this time

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 ($):	*$*	*39,327.81*
TRC Costs ($):		
Utility program cost (less incentives):	$	1,500.00
Participant cost:	$	9,900.00
Total TRC costs:	$	11,400.00
Net TRC (in year CDN $):	$	27,927.81
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	3.45

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

Conservation Programs:

		lifecycle	in year
Demand savings (kW):	*Summer*		
	Winter		
Energy saved (kWh):		*616770*	616770
Other resources saved :			
Natural Gas (m3):			
Other (specify):			

Demand Management Programs:

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

Demand Response Programs:

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

Power Factor Correction Programs:

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

Distribution system power factor at end of year (%):			
Line Loss Reduction Programs:			
Peak load savings (kW):			
	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*:**

Utility direct costs ($):	*Incremental capital:*	$	-
	Incremental O&M:	$	1,500.00
	Incentive:	$	-
	Total:	$	-
Utility indirect costs ($):	*Incremental capital:*		
	Incremental O&M:		
	Total:		-
Participant costs ($):	*Incremental equipment:*		9900
	Incremental O&M:		
	Total:	$	9,900.00

E. Comments:

Costs relate to the purchase, and installation and monitoring of equipment.
Cold water wash calculation based on a 3% redemption rate of 44000 distributed coupons.

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Customer Awareness Education

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

Customer awareness and education are key factors in achieving a heightened change in energy efficiency. Programs will be targeted at home and business These programs will illustrate the principal areas of consumption and demonstrate the savings impact available through changing consumption patterns and conservation. These programs could
· An internet portal where customers can create custom profiles of their home or business and understand where they are consuming electricity
· Self registered programs that allow customers to track their savings through changing behavior or adopting more energy efficient appliances
· Implementation of tools that illustrate the affect of weather, seasonality, and additional occupants on energy consumption for each individual consumer
· Implementation of campaigns to build both general and targeted awareness and measure the impact of direct marketing on consumption
Target users: All businesses and residents in the City of Oshawa. Benefits: Helping to kept energy efficient use top of mind. Evaluation : Radio advertisements and a school energy efficiency program are currently underway through a customer survey and spot visits of presentations.

Measure(s):

	Measure 1	Measure 2 (if applicable)	Measure 3 (if applicable)
Base case technology:	60 Watt Incandescent		
Efficient technology:	15 Watt compact flourescent		
Number of participants or units delivered:	168		
Measure life (years):	4		

B. **TRC Results:**

TRC Benefits ($):	*$*	*3,747.67*
TRC Costs ($):		
Utility program cost (less incentives):	$	-
Participant cost:	$	302.40
Total TRC costs:	$	302.40
Net TRC (in year CDN $):	$	3,447.67
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	12.40

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

Conservation Programs:

Demand savings (kW):	*Summer*		
	Winter	3	
	lifecycle	*in year*	
Energy saved (kWh):		15785	
Other resources saved :			
Natural Gas (m3):			
Other (specify):			

Demand Management Programs:

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

Demand Response Programs:

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

Power Factor Correction Programs:

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

Line Loss Reduction Programs:

Peak load savings (kW):		
	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*:**

Utility direct costs ($):	*Incremental capital:*	$ -
	Incremental O&M:	$ -
	Incentive:	$ 771.83
	Total:	$ 771.83
Utility indirect costs ($):	*Incremental capital:*	
	Incremental O&M:	
	Total:	-
Participant costs ($):	*Incremental equipment:*	302
	Incremental O&M:	
	Total:	$ 1,073.83

E. Comments:

Radio costs will be placed here.

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Independent Market Operator Demand Response Pilot Project

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

This program is a two year pilot that is assisting the Independent Electricity System Operator to enroll and work with customers to shed load.
The program identifies customers who can shed load on short notice. The notification is driven by a price spike and delivered to them by e-mail.
Target users Customers who have the ability to drop load
Benefits: To the IESO to see how much load can be dropped in an emergency and customer to curtail energy costs. Evaluation: We are currently evaluating the cost benefit of continuing this program.

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):	$	45,577.00
Participant cost:	$	-
Total TRC costs:	$	45,577.00
Net TRC (in year CDN $):	$	45,577.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	-

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

Conservation Programs:

		lifecycle	in year
Demand savings (kW):	*Summer*		
	Winter		
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):	500
Peak hours dispatched in year (hours):	

Power Factor Correction Programs:

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

Line Loss Reduction Programs:

Peak load savings (kW):		
	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*:**

Utility direct costs ($):	*Incremental capital:*	$ -
	Incremental O&M:	$ 45,577.00
	Incentive:	$ -
	Total:	$ 45,577.00
Utility indirect costs ($):	*Incremental capital:*	
	Incremental O&M:	
	Total:	-
Participant costs ($):	*Incremental equipment:*	
	Incremental O&M:	
	Total:	-

E. Comments:

Costs are for determining interuptable load and on going managament of the project.

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Non-Profit Housing

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

We will be working with local government and social agencies to identify opportunities to reduce energy costs for non-profit housing and low income earners.
It is very important that OPUCN take a lead in working with social agencies to ensure that residents in non-profit housing can participate in conservation.
Target users: Non profit and fixed income i.e. pensioner
Evaluation: Possible lighting retro fits, appliance upgrade, and water heater optimizations are being considered as saving measures at this time.

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):	$ -

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 begining 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):			

D. **Program Costs*:**

Utility direct costs ($):	*Incremental capital:*	None at this time
	Incremental O&M:	None at this time
	Incentive:	
	Total:	
Utility indirect costs ($):	*Incremental capital:*	
	Incremental O&M:	
	Total:	-
Participant costs ($):	*Incremental equipment:*	
	Incremental O&M:	
	Total:	-

E. Comments:

There is currently a proposal in front of Oshawa requesting an incentive for $40K

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

Appendix B - Discussion of the Program

A. **Name of the Program:** Smart Meter Residential and Commercial

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

A pilot program for 200 residential SMART meters was deployed to enable the assessment of metering, communications, settlement, load control and other technologies that may be used to accommodate the universal application of SMART meters in the future. Although the formal definition of a SMART meter has not been decided the Board the Utility felt it prudent to perform a technological assessment of systems available today.
This program supports the Minister of Energy's commitment to the installation of 800,000 SMART meters across Ontario by 2007. It will provide OPUCN with the experience and knowledge needed to efficiently expand the use of SMART meters over the next several years. On the commercial side we have purchased a product that we are testing called power view. It is a web based system that can allow customers to look at their interval meter data, profile their usage and see the results.
Target users: Eventually 500 residential customers throughout the City.
Benefits: Proof that certain forms of technology will perform satisfactory and that customers can match their usage to less expensive off peak hours when rate structures send the correct price signals.

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 ($):	*$*	*156,312.00*
TRC Costs ($):		
Utility program cost (less incentives):		
Participant cost:	$	-
Total TRC costs:	$	156,312.00
Net TRC (in year CDN $):	$	156,312.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	-

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 begining 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):	

D. **Program Costs*:**

Utility direct costs ($):	*Incremental capital:*	$ 156,312.00
	Incremental O&M:	$ -
	Incentive:	$ -
	Total:	$ 156,312.00
Utility indirect costs ($):	*Incremental capital:*	
	Incremental O&M:	
	Total:	-
Participant costs ($):	*Incremental equipment:*	
	Incremental O&M:	
	Total:	-

E. Comments:

Costs relate to the purchase, and installation and monitoring of equipment for both Residential and Commercial meters ..no savings

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

Appendix B - Discussion of the Program

A. **Name of the Program:** System Optimization

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

The objective of this portion of OPUCN's plan is to be able to identify the major causes of losses on OPUCN's distribution feeders. This first involves a high level analysis of losses from distribution lines and transformers, and estimation of the percentage contribution of each to the total system losses. This information will be used to develop a loss reduction strategy. A further objective would be to identify specific opportunities for loss mitigation on the distribution systems. Detailed feeder modeling would be required to assess the financial impact of particular mitigation techniques on individual feeders. This work would establish areas where implementation of loss reduction techniques could be cost justified.
The overall intent of the study would be to illustrate where cost savings would be available and the methodology by which savings could be achieved. The loss reduction techniques that
could be applied most easily by the utility to achieve the greatest return with the least investment in time or equipment would be determined.
Target users: The Distribution system
Benefits: A reduction is energy losses within the distribution system. Evaluation: To soon to do so.

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):	$	103,025.00
Participant cost:	$	-
Total TRC costs:	$	103,025.00
Net TRC (in year CDN $):	$	103,025.00
Benefit to Cost Ratio (TRC Benefits/TRC Costs):	$	-

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 begining 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):

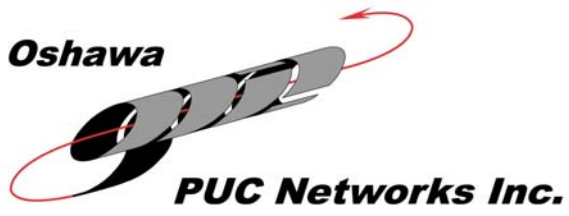
D. **Program Costs*:**

Utility direct costs ($):	*Incremental capital:*	$	70,625.00
	Incremental O&M:	$	32,400.00
	Incentive:	$	-
	Total:	$	103,025.00
Utility indirect costs ($):	*Incremental capital:*		
	Incremental O&M:		
	Total:		-
Participant costs ($):	*Incremental equipment:*		
	Incremental O&M:		
	Total:		-

E. Comments:

Consulting and study fees to identify the system losses.

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



Oshawa PUC Networks Inc.

Conservation and Demand Management

2005 Annual Report

Oshawa PUC Networks Inc.
RP-2004-0203 / EB-2005-0549

March 31 2006

Table of Contents

1. Introduction

On March 15, 2005 Oshawa PUC Networks Inc. (OPUCN) was granted final approval for its Conservation and Demand Management (CDM) Plan as filed with the Ontario Energy Board (the "Board"). The Board's decision stated that annual reporting "should be done on a calendar year and should be filed with the Board no later than March 31st of the following year". On December 21, 2005 the Board issued a Guideline for Annual Reporting of CDM Initiatives that explained more fully these reporting requirements. This report has been prepared in accordance with those guidelines.

OPUCN serves more than 45,036 residential, 4052, commercial and 529 industrial customers within its 149 square kilometer service area. Oshawa faces a unique challenge with approximately 15% of the customer base being electrically heated. With this heating load Oshawa continues to winter peak. This trend is shifting slowly and it is anticipated that we will join other summer peaking utilities in the next five years. OPUCN's Conservation and Demand Management plan was designed to identify, alter and measure reductions in consumptions and demands in all customer classifications.

Much of OPUCN's first year efforts have been directed into studying, installing and testing new metering technology and focusing on the establishment of baselines from which additional and best-fit programs can be created. This report details our progress to date.

2. Evaluation of Overall Plan

Please refer to Appendix A for an evaluation of OPUCN's Conservation and Demand Initiatives for the year ending December 31, 2005.

In reviewing the information provided in both Appendix A and Appendix B, it should be noted that much of the work undertaken by OPUCN during 2005 was related to baseline measurement and program development. Given a lack of readily available residential baseline usage information OPUCN felt it prudent to develop its own baseline data to assist in identifying 'best fit" CDM programs. The determination of baseline data collection and interpretation will continue well into 2006.

Some components of OPUCN's CDM plan relate to the deployment and testing of "Smart Meter" technology, which is being undertaken to support provincial government policy direction. No effort is being made to assess the impact of "Smart Meters" on kWh consumption and kW demand.

3. Discussion of the Programs

3.1 Residential Customers

Establishing Baselines and Measuring Impacts

Program Description

In order for OPUCN to move forward with any program to reduce demand and energy consumption we elected to begin to study usage patterns over a wide variety of residential customers. This baseline study will help us create more targeted programs and will in the long turn provide a greater return on our CDM investment.

Discussion of 2005 Activities

Actions

- "Smart" meter technology was installed on five homes to perform beta testing once proven, another fifty meters were installed.
- The meter technology used in this baseline study transmitted data across the Utility's power lines. This was the key driver in targeting homes for the test.
- Surveys, which included questions regarding the type of occupancy, heating, major appliances and other pertinent questions were completed by each of the participants.
- Customers were equipped with an Internet portal that provided them with a tool to review their electricity consumption patterns. This allowed them to see the affect of changes they made in their own consumption patterns. And to make adjustments where possible.
- Customer usage data was captured on an hourly basis for a period of 10 months and then compiled into a database. A preliminary analysis was performed on this data.

Target Group

- Residential customers

Benefits

- Allows the utility to establish a baseline that reflects Oshawa's customer's consumption patterns and work towards a custom fit solution for the energy efficiency programs we wish to provide.

Results to Date from the KINECTRICS study

- Data has been retrieved on a daily basis on these meters.
- Customer usage data has been posted to their individual view site.
- Survey results have been complied on the participants.
- A study was performed to review the usage patterns of the customers.
- Data is now available for internal and external benchmarking.

Next Steps

- We are currently working with the University of Ontario Institute of Technology and the Ontario Centre of Excellence to perform a more in depth study of this data and that of another 500-meter locations.

Customer Awareness and Education

Program Description

OPUCN has used several forms of media to promote more efficient use of electricity within and beyond its own service area. We have also provided our all our staff with energy efficiency kits to help educate them on the value of compact fluorescent which provided a timer and two compact fluorescent bulbs to install in their own home.

Target

All residential and business customers in the City of Oshawa

Benefits

Developed a heightened awareness of the need to use electricity more wisely and to reduce demand during peak periods. Also, to dispel the myths about energy i.e. leaving the lights on uses less than turning it off and back on again.

Discussion of 2005 Activities

Actions

- Developed Radio Spots, which are heard three times daily on three different radio stations that broadcast to the Region of Durham.
- Aired a one-hour live call in program (The Riley Alternative on Rogers Television Durham). Peter Love was our guest on the show and he answered questions on what the Ontario Power Authority wanted to communicate to the public. The estimated audience for this show is 45,000.
- Provided energy efficiency kits to all our staff. They included, two compact fluorescent bulbs, one outdoor timer, and a set of dryer balls.
- Delivered cold-water wash coupons to more than 44,000 customers in our service area. The coupon was an incentive to switch people from hot water to cold when doing laundry.
- Distributed in our bills the Ministry of Energy's "Conserve Energy and Save Money" pamphlet.
- Made available to our customers energy efficient pamphlets and flyers on compact fluorescents and other forms of energy savings sourced through Energy Canada and are displayed in our front lobby.
- Published and delivered a spring and fall customer newsletter with a focus on saving energy.

Results to Date

- The effects of our efforts will be complied by comparing the results of a customer survey that was conducted in March of 2005 with one that is being conducted in March of this year.
- Early signs indicate that our local radio spots are registering with listeners in the Oshawa area.

Next Steps

- Our education program will be reviewed and adjusted accordingly upon receipt of the results of the customer survey.
- We will be investigating how best to educate younger students regarding a new energy efficient way of life. We are looking at creating an electrical safety and efficiency program targeting grades four and five that can be delivered to schools in our area.
- We are also looking at expanding our media education program to include local community television sponsorships.

- We will be investigating the merits of being aligned with the “POWERWISE” branding that Ontario Government recently adopted. Once the costs of such an alliance are determined a decision will be made.

Non-Profit Housing Project Pilot

Program Description

Oshawa has several non-profit housing projects that could benefit from energy efficiency incentives. Some funding needs to be used to audit locations and determine the areas of greatest need for efficiency programs. Traditionally these non-profit housing complexes were built for the lowest capital expenditure for heating. The majority of the units built in the 70's and 80's were equipped with baseboard electric heating. When electricity cost increase the non-profit housing tenants tend to be the hardest hit. Our goal is to work with this sector to identify areas where funding will facilitate the greatest savings and move to implement these ideas. We feel it is important that we take a lead in working with social agencies to ensure that residents in non-profit housing can participate and benefit from joint conservation activities.

Target

All "not for profit" housing in the City of Oshawa

Benefit

Targeted to all low and fixed income individuals who are looking for guidance and funding to help them achieve energy efficiency and reduce the impact on their financial resources.

Discussion of 2005 Activities

Action

- Currently two properties in Oshawa have presented OPUCN with a plan to perform major retro fits on more than 100 Units. The projects involve a retro fit of lighting, appliances and in some cases water heater optimizations.
- OPUCN staff has also been invited to review with the Region of Durham a study of several non-profit residential properties and make recommendations as to programs that will yield the greatest return on investment.

Results to Date

- When implemented annual energy savings identified at the two locations in Oshawa total 267,250 kWh and a demand reduction of 150 kW.

Next Steps

- OPUCN will be attending a meeting in late March with the Durham Region Housing Authority, which will be presented the findings of an energy audit study done on several non-profit housing locations in the area. We hope this will provide us with valuable networking and data to help us to identify opportunities to assist in energy reductions.

Co-Branding With Other LDC's and Market Participants

Program Description

This program was originally designed to work with other electrical utilities and retailers to provide incentives for energy efficient consumer products such as such as discount coupons, and energy efficiency branding. This concept was formalized when the Government of Ontario recently adopted the POWERWISE brand.

Target

All consumers in the Oshawa area

Benefit

Raises awareness and provides incentives for customers to try energy efficient products.

Discussion of 2005 Activities

Action

- OPUCN was reluctant to get on board with any co branding exercise until there appeared to be a critical mass. With the announcement in late fall that the Ontario Government had decided to adopt the POWERWISE brand we re-evaluated our position and have recently expressed our interest in becoming an affiliate member.

Results to Date

- Generally the brand has gained recognition and the large media exposure has helped it keep its momentum. The brand is now recognizable to many.

Next Steps

- We will be evaluating the costs of joining the POWERWISE group of utilities over the next two months. Of primary concern is how the cost of media purchases will be allocated to the POWERWISE associates.

Smart Meter Residential

Program Description

Two pilot programs for residential "smart meters" were deployed to enable the assessment of metering, communications, settlement, load control and other technologies used to accommodate the universal application of "smart meters" in the future.

This program supports the Minister of Energy's commitment to the installation of 800,000 SMART meters across Ontario by 2007. It will provide OPUCN 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.

Target

Residential homes

Benefit

This effort is designed to test technology that will assist the government in meeting its goal of 800,000 "smart meters" installed by the end of 2007.

Discussion of 2005 Activities

Action

- Installed a group of 5 and then another 50 "Smart" meters that transmit their hourly meter data through power line carrier technology. This means that all meter data is carried to the data collection station on the Utility's own power lines. This eliminates the need to run an extra communication line.
- Installed a group of 200 Smart Meters that transmit data to each other and then a central station via radio transmission. These meters were installed throughout the City of Oshawa to test the signal propagation in different situations.
- Installed high speed internet lines to allow the collection of meter data.
- Participated as an active member in the Ontario Utility Smart Meter group to share our results with utilities across the province.

Results to Date

- Meter functionality has been encouraging and meter testing continues.
- Customers have actively managed their energy usage by using the internet profile available for their home.

Next Steps

- Install an additional 300 "smart meters" in Oshawa to continue to test the technology.
- The University of Ontario, Institute of Technology has been asked to participate in studying the usage data to help expand on OPUCN's baseline data.

3.2 Commercial and Industrial Customers

Independent Electricity System Operator Demand Response Pilot Project

Program Description
This program was designed to help customers benefit from the I.E.S.O's demand response pilot project. Customers were assisted in determining what load they could easily drop from when requested to by the I.E.S.O. This is a two-year pilot, directed at customers who can reduce demand when notified.

Target
This program is aimed at interval metered larger customers who can shed loads on notification from the I.E.S.O.

Benefits
Allows the I.E.S.O. to shed load in emergencies and high price point times quickly.

Discussion of 2005 Activities

Action
- In concert with a third party, OPUCN performed site visits with several customers introducing them to the Timed Demand Response Program and the potential benefits of it.
- We made presentations with the I.ES.O and the Ontario Energy Board to help customers understand the program.
- We were approved to assemble customer load totalling 500 kW.
- Five customers with interruptible load were signed up to the program.
- An email advisory program that was price driven was set up. This program sends an alert to a customer indicating a price threshold has been attained and that it would be beneficial for the system and for them financially to drop load.

Results to Date
- Currently have 5 customers signed up for the program with a total load shed available of .5 of a mega watt.
- Since the programs inception customers have dropped load on notification. We are currently assessing the value of these reductions and they will be included in the 2006 CDM report.

Next Steps
- We are reviewing a proposal to increase the number of customers currently on this program.

3.3. System Optimization

System Optimization

Program Description
OPUCN has identified that it requires technology enhancements in order to properly perform distribution system optimization. The technology enhancement involves the purchase of distribution system software and a GIS system upgrade in order to allow the software to function properly.

Distribution system optimization software has been researched and a software package has been selected for purchase. The components of the GIS system requiring upgrade have been identified and a short list of vendors has been created.

Results to Date:

There have been no results to date with regard to distribution system optimization.

Next Steps:

The next steps in OPUCN's distribution system optimization process include:

1. Select the successful vendor for the GIS system upgrades
2. Perform the GIS system upgrade
3. Purchase and install the distribution system optimization software
4. Perform the distribution system optimization calculations
5. Perform the necessary field operations to optimize the distribution system
6. Measure the actual results of optimizing the distribution system

4. Lessons Learned

Working Together
Working together with other CDM oriented organizations and utilities will be essential for the success of CDM initiatives.

OPUCN worked with the Independent Electricity System Operator (IESO) in 2005 to draw together participants in the Demand Response Program (TDRP). More recently OPUCN has begun working together with Veridian Connections to share and explore ideas in the Region of Durham to reduce energy consumption and demand.

Market Conditions
Given the press that has surrounded “smart meters” customers are comfortable with the term and there seems to be an appetite for the metering style. The price of energy seems to be garnering the attention of residential customers and would appear to be one of the drivers for them to embrace energy efficiency. Local advertising has been showcasing Energystar appliances, compact fluorescent bulbs and in the fall LED Christmas lighting.

Commercial and Industrial customers seem to be more reluctant to make expensive investments in conservation and demand management to reduce energy waste. In discussion with at least one large user on a capital program, a payback of two years or less is considered feasible. There may be a requirement for larger incentives for these customers including grants and / or tax breaks to drive their participation.

Regulatory and Policy Environment
Ontario’s fast changing regulatory and policy environment has presented challenges for distributors. The number of entities promoting conservation is increasing with the Ministry of Energy, the Ontario Power Authority and the Independent Electricity System operator all taking on roles in promoting a conservation culture. A single delivery mechanism is required to eliminate the appearance of inefficiencies and confusion for the rate payer.

Distributors continue to be challenged by new Board requirements related to the delivery of CDM. For example, it was not anticipated in late 2004 that TRC analysis would be a requirement for this annual report, and the issue of whether ‘non-incremental’ LDC expenses should be deemed as eligible for inclusion in an LDC’s spending obligation. This was not addressed until near the end of 2005.

Comments on Program Success

Last year will be viewed as the start up year for many utilities in the conservation and demand management process.

Most of the consumption pattern data for residential and commercial customers that Ontario Hydro captured in the late 1970's and early 1980's has been lost or is unavailable to use as a resource to assist in the design and delivery of CDM programs.

Oshawa has elected to re-establish this data and will continue to do so. We see this as one of the most important investments in Conservation and Demand Management. OPUCN looks forward to designing and matching additional CDM initiatives to fit customer's needs as 2006 progresses.

	Successful / H/M/L	Continue	Notes
Residential Customers			
Establish Baselines and Measuring Impacts	Yes High	Yes	Work will continue to interpret data and design programs.
Customer Awareness and Education	Too soon to tell	Yes	Will continue to expand our work in this area.
Non-Profit Housing	Promising for 2006	Yes	Identifying opportunities and acting on them will be focus for 2006.
Residential Smart Meters	Yes Medium	Yes	Another 300 meters will be installed this year and their flexibility tested. These will also add valuable data to our ongoing baseline study.
Co-Branding	Too soon to tell		Investigative only into POWERWISE in 2005.
Commercial and Industrial Customers			
IMO Demand Response	Yes Medium	Yes	We will be reviewing this program in 2006.
System Optimization			
System Optimization	Too soon to tell	Yes	
Loss Mitigation Strategies	Too soon to tell	Yes	

5. Conclusion

Oshawa PUC Networks Inc. believes that a tailored DSM response to customers needs is the most prudent way to achieve maximum benefit for the customer and the Utility. Although the majority of the work we have performed in 2005 has been largely baseline determination and “smart meter” technology testing, we see meaningful opportunities identified in 2006 and programs launched to meet the needs identified.

Now that the Board has clarified the need to measure results using the “Total Resource Cost” methodology we have a tool that will measure the value of all our proposed investments.

Oshawa PUC Networks Inc. continues to be committed to the deployment of its Conservation and Demand Management programs and looks forward to the exciting opportunities ahead.