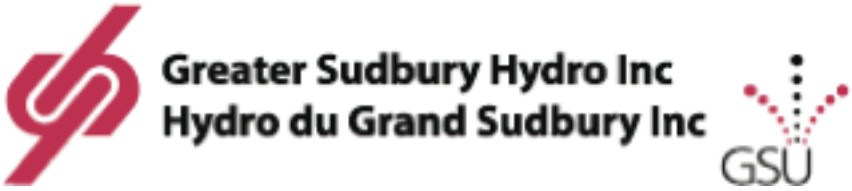


# 2009 Annual Report for Board Approved Conservation and Demand Management Funding

**Filed: September 2010**

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# 1.0 Introduction

## *1.1 Background*

In response to the Minister of Energy's authorization to allow electricity distributors to use their third installment of market adjusted revenue requirement (MARR) on Conservation and Demand Side Management (CDM) Greater Sudbury Hydro Inc. (GSH) began delivering programs in 2005. Within three years GSH successfully delivered programs to each of its customer classes, achieving more than 10.5 MWh and 864 kW in electricity savings. Some of the highlights from that effort include:

- The launch of Sudbury Landfill Gas Generation Plant, the first of its kind in Northern Ontario, generating enough electricity to power approximately 1,200 homes.

- The introduction of the electric thermal storage technology to the marketplace, enabling customers to shift 70% - 85% of their electricity usage to off peak periods.

- The launch of the smart meter pilot program helping Greater Sudbury (i) gain knowledge in preparation of a full-scale deployment of smart meters; and, (ii) educate the public.

- The Kill-A-Watt monitor program, designed to help customers learn more about the energy consumption of their appliances.

On July 13, 2006 the Minister of Energy issued a directive to the Ontario Power Authority (OPA) to coordinate and fund the delivery of CDM by local distribution companies in Ontario. $400 million was allocated to this fund over a three-year period and GSH quickly became a strong supporter of the OPA programs.

Through its contract with the OPA, GSH has been delivering the OPA's Every Kilowatt Counts (EKC), Fridge Roundup, peaksaver®, ERIP and Summer Savings programs throughout its franchise area. Since beginning this effort in 2006, GSH has helped save 11,373 MWh[1] and 5.448 MW[2] in electricity savings.

Recognizing the importance of sustaining CDM and the special needs for ratepayers in Northern Ontario, in July 2008 the company sought and was granted approval from the Board for additional CDM funding for the period of 2009 to 2011. This funding now supports a suite of custom CDM programs designed to bridge the gap

[1] Based on Ontario Power Authority letter dated August 13, 2010 re: estimated allocation of 2006-2009 provincial conservation results to Local Distribution Company service territories - update to November 2009 report.
[2] IBID

between the needs of the provinces and the local constraints of the Greater Sudbury community.

## *1.2 Report Overview*

This report provides highlights and results of GSH's custom program activity for fiscal 2009 as compared to the Board approved plan. The programs in this plan include:

- Community Awareness Program
- Electric Thermal Storage Program
- Commercial Parking Lot Plug Controller Program
- Vending Machine and Self Service Coolers Efficiency Program
- LED Traffic Light Conversion Program
- West Nipissing Street Light Conversion Program

This portfolio includes a combination of resource acquisition, education and pilot programs aimed at both the residential and business markets.

The residential suite of programs includes the Community Awareness Program (education) and the Electric Thermal Storage – 'Build Up Heat While You Sleep' (pilot) Program.

The business market suite of programs includes the Commercial Parking Lot Plug Controller Program (resource acquisition), Vending Machine and Self Service Coolers Efficiency Program (resource acquisition), LED Traffic Light Conversion Program (resource acquisition) and West Nippissing Street Light Conversion Program (pilot).

## 2.0 Program Results Summary

With this portfolio of CDM programs, GSH has ensured that the vast majority of its customer classes are provided access to energy efficiency programs that are cost-effective and that provide appropriate incentives to maximize participation.

Results for the resource acquisition programs are calculated based on prescriptive savings and related assumptions for the specific measure as approved by the Board in the CDM plan. These savings and related assumptions can be found in Appendix B. In addition to program results this report also incorporates planned evaluations activity for the remaining period of this Custom Program CDM Plan.

The following tables summarize 2009 program costs and savings.

### Table 2.1 – Summary of 2009 Program Spending

| | 2009 CDM Operating and Capital Expenditures | | |
|---|---|---|---|
| | **Budget** | **Actual** | **Variance** |
| Community Awareness Program | $23,000 | $5,012 | $17,988 |
| Electric Thermal Storage Program | $257,000 | $48,384 | $208,616 |
| Commercial Parking Lot Plug Controller Program | $227,000 | $131,244 | $95,756 |
| Vending Machine and Self Service Coolers Efficiency Program | $125,500 | $64,878 | $60,622 |
| LED Traffic Light Conversion Program | $33,927 | $558 | $33,369 |
| West Nipissing Street Light Conversion Program | $43,788 | $574 | $43,214 |
| Portfolio Evaluation | $35,000 | $929 | $34,071 |
| **Total** | **$745,215** | **$251,579** | **$493,636** |

### Table 2.2 – Summary of Program Savings

| | **Budgeted Net kWh** | **Actual Net kWh** | **Variance** |
|---|---|---|---|
| Community Awareness Program | n/a | n/a | n/a |
| Electric Thermal Storage Program | n/a | n/a | n/a |
| Commercial Parking Lot Plug Controller Program | 340,200.00 | 349,725.60 | 9,525.60 |
| Vending Machine and Self Service Coolers Efficiency Program | 354,375.00 | 36,855.00 | (317,520.00) |
| LED Traffic Light Conversion Program | 176,440.66 | - | (176,440.66) |
| West Nipissing Street Light Conversion Program | 72,345.00 | - | (72,345.00) |

## 2.1 Residential Programs and Performance

### *2.1.1. Community Awareness Program*

#### Program Description

The goal of this 'Community Awareness' program is to engage the public, businesses and youth in energy conservation activity that will create lasting behavioral and attitude changes.

Building on the success of its community awareness activities delivered with third tranche funding, this program includes the following elements:

- Waste-Not-Watt-Not Program;
- Kill-A-Watt Monitor Program;
- Home Sweepstake (Sudbury) and;
- Smart Meter Education Program

Subsequent to receiving Board approval for its 2009 CDM budget, Greater Sudbury received an additional $27,000 in funding from the Electricity Distributors Association through the Ontario Power Authority's ("OPA") Community Initiatives Fund to further support its 2009 community awareness activities in its service area.

#### 2009 Highlights and Activities

The 2009 program activities not only demonstrated a grassroots approach to developing a conservation culture in Northern Ontario but also served as a way to enhance Greater Sudbury's exposure in the community. Increasing community awareness of energy conservation and Greater Sudbury's efforts has provided an opportunity to expand the company's footprint and maximize its reach with other CDM program offerings.

Program activities included:

- Promotion of and participation in International Earth Hour (including both newspaper and radio advertising).
- Attendance at 'Earth Care Sudbury Partnership' meetings to inform members of Green Energy Act and CDM activities.
- Advertisement of energy conservation tips in Cambridge College student day timers.
- Attendance at the 2009 Living Building Breakfast.
- Local radio and television interviews supporting renewable energy and conservation.
- Support for Sudbury Kinsmen Home-Showcase featuring energy efficient lighting and appliances.

**Program Costs:**

The table below shows both Board approved and actual spending for 2009.

**Table 2.1.1. Program Costs (Budget vs. Actual)**

| Community Awareness Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Operating Expense | $23,000 | $5,012 | $17,988 |
| Capital | $0 | $0 | $0 |
| **Total** | **$23,000** | **$5,012** | **$17,988** |

**Savings (kWh):**

This 'Community Awareness' program is a market support program and does not have any direct demand or energy savings associated with it. As such, no savings have been identified for this program.

### Planned Evaluation Activities

The focus of the evaluation activities for this program will be to measure the level of awareness of energy conservation and GSH's program activities. To achieve this, a random sample of Sudbury residents will be surveyed to measure awareness levels of GSH's community based efforts.

## *2.1.2. Electrical Thermal Storage Heating (ETS) Program – 'Build Up Heat While You Sleep'*

### Program Description

Electric Thermal Storage Heating (ETS) is an off-peak electric heating system that stores low cost electricity in the form of heat for use in heating needs throughout 24 hours a day. ETS equipment utilizes a storage medium to store heat during off-peak hours, as defined in the OEB Regulated Price Plan, and releasing it consistently throughout the day during the mid-peak and on-peak hours. In addition thereto, ETS also has the ability to control electric water heaters off-peak. The benefits of the project were significant in terms of: (i) reducing energy demand at critical peak periods when Ontario's electricity system is most strained; and, (ii) providing the customer with considerable savings on their heating bill.

Due to high equipment and installation costs for the ETS technology, this program is in pilot phase, providing Greater Sudbury an opportunity to test market acceptance.

## 2009 Highlights and Activities

In Sudbury there remains large areas in which only electric heat is available. Utilizing local equipment suppliers and installers, the program attempts to educate consumers on the benefits of a ETS when combined with time of use rates.

Program activities included:

- Attendance at the Sudbury Home Builders Show.
- Promotional material distributed at the International Earth Day Festival.
- Attendance at the New Sudbury Centre during Energy Conservation Week.
- Bill inserts.

These activities will be continued throughout 2010 as well as rotating advertising on local television.

### Participation:

Participation levels were lower than expected in 2009 however GSH recognizes that new programs need sufficient time to start up and establish efficient operation. With qualified suppliers and installation contractors now in place, GSH expects that the program will be operating at maximum efficiency by the end of 2010.

The table below shows both budgeted and actual program participation for 2009.

### Table 2.1.2a. Program Participation (Budget vs. Actual)

| Electric Thermal Storage Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Total | 50 | 15 | (36) |

### Program Costs:

The table below shows both Board approved and actual spending for 2009.

### Table 2.1.2b. Program Costs (Budget vs. Actual)

| Electric Thermal Storage Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Operating Expense | $257,000 | $48,384 | $208,616 |
| Capital | $0 | $0 | $0 |
| **Total** | **$257,000** | **$48,384** | **$208,616** |

**Savings (kWh):**

The ETS system is a load shifting technology and does not provide electricity savings. Energy used during peak periods is shifted to mid and off-peak periods where the cost for electricity is more economical.

### Planned Evaluation Activities

GSH will use billing data to analyze before and after electricity consumption patterns for a select group of program participants. GSH will also conduct in-depth interviews with a selection of program participants to gain insight on marketing effectiveness, ease of program enrollment and general feedback.

In addition, GHS will examine the marketing and outreach materials utilized by suppliers and installers. If required GSH will realign marketing efforts to help gain greater acceptance by customers in such a way as to increase program enrollments and equipment installations.

## 2.2 Business Markets Programs and Performance

### *2.2.1. Commercial Parking Lot Plug Controller Program*

### Program Description

Parking lot controllers are electronic devices that control the amount of electricity used by an outdoor plug, allowing building and property managers to effectively manage their electricity usage for block heaters in outdoor parking lots during the winter months.

Studies have shown that parking lot plug controllers have been proven to reduce electricity costs by up to 50 per cent, yet ensure trouble-free starts for tenants, staff and guests.

Targeting multi-residential and commercial buildings, this program offers a $175 financial incentive per device to encourage building and property managers to install controllers at their sites. The participant purchases the unit directly from GSH and then arranges installation with a certified electrical contractor. Once the units are installed and operating, the participant calls Greater Sudbury to arrange an installation inspection. If the unit has been correctly installed the participant is rebated the full cost of the unit, plus a portion of the installation costs.

## 2009 Highlights and Activities

The main focus for 2009 program activity was direct marketing. In the fall of 2009, the 'What an Opportunity' brochure containing information about GSH's business market programs was mailed to all Sudbury and West Nippissing business customers.

Future marketing activity will be expanded to include:

- Attendance at the Sudbury Home Builders Home Show
- Advertising at the International Earth Day Festival
- Information at local retailers (i.e. Costco)
- TV Advertising

### Participation:

The first year of the program was extremely successful, with participation levels exceeding budget. The table below shows both budgeted and actual participation for 2009.

### Table 2.2.1a. Program Costs (Budget vs. Actual)

| Commercial Parking Lot Plug Controller Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Total | 500 | 514 | 14 |

### Program Costs:

Although program participation exceeded expectations, program spending was nearly 80% lower than budget. The table below shows both Board approved and actual spending for 2009.

### Table 2.2.1b. Program Costs (Budget vs. Actual)

| Commercial Parking Lot Plug Controller Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Operating Expense | $227,000 | $48,392 | $178,608 |
| Capital | $0 | $82,852 | $(82,852) |
| **Total** | **$227,000** | **$131,244** | **$95,756** |

**Savings (kWh):**

As a result of higher than anticipated participation, program savings were also 3% higher than budgeted.

**Table 2.2.1c. Program Savings (Budget vs. Actual)**

| Commercial Parking Lot Plug Controller Program | Budgeted Net kWh | Actual Net kWh | Variance |
|---|---|---|---|
| Total | 340,200.00 | 349,725.60 | 9,525.60 |

### Planned Evaluation Activities

GSH will use billing data to analyze before and after electricity consumption patterns for a select group of program participants. GSH will also conduct in-depth interviews with a selection of program participants to gain insight on marketing effectiveness, ease of program enrollment and general feedback.

## *2.2.2. Vending Machine and Self Service Coolers Efficiency Program*

### Program Description

Vending machines and self-serve coolers present an excellent opportunity for energy conservation. They operate 24/7 and consume six times the amount of energy of a household refrigerator. By installing vending machine power controllers, tests prove 30% - 40% energy savings for the vending miser, and 20% - 30% energy savings for cooler misers. The vending machine or cooler is plugged into a power controller, which consists of a passive infrared motion sensor and control unit.

The device monitors the presence of people in the room using infrared technology. If no one is present for 15 minutes, the device automatically powers off the vending machine but maintains the temperature of the product. Once powered off, the device monitors the temperature of the room and will power the machine on in 1.5 to 3 hour intervals. The device allows the machine to run a complete cycle before shutting down.

This program offers program participants a $175 financial incentive per device. Participants can purchase the devices directly from Greater Sudbury Hydro. Once installed the participant call Greater Sudbury to arrange an installation inspection. If installed correctly the participant receives an incentive.

## 2009 Highlights and Activities

Marketing efforts were combined with the Commercial Parking Lot Plug Controller program activities and included a direct marketing campaign. Efforts will be expanded in 2010 to include:

- Attendance at the Sudbury Home Builders Home Show
- Advertising at the International Earth Day Festival
- Information at local retailers (i.e. Costco)
- TV Advertising

### Participation:

Program participation was nearly 90% lower than expected. The table below shows both budgeted and actual participation for 2009.

### Table 2.2.1a. Program Participation (Budget vs. Actual)

| Vending Machine and Self Service Coolers Efficiency Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Total | 250 | 26 | (224) |

### Program Costs:

Similarly, program costs were nearly 94% below budget. The table below shows both Board approved and actual spending for 2009.

### Table 2.2.1b. Program Costs (Budget vs. Actual)

| Vending Machine and Self Service Coolers Efficiency Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Operating Expense | $125,500 | $9,051 | $116,449 |
| Capital | $0 | $55,827 | $(55,827) |
| **Total** | **$125,500** | **$64,878** | **$60,622** |

**Savings (kWh):**

As a result of lower program participation, savings were also nearly 90% lower than expected. The table below shows both budgeted and actual savings for 2009.

**Table 2.2.1c. Program Savings (Budget vs. Actual)**

| Vending Machine and Self Service Coolers Efficiency Program | Budgeted Net kWh | Actual Net kWh | Variance |
|---|---|---|---|
| Total | 354,375.00 | 36,855.00 | (317,520.00) |

## Planned Evaluation Activities

GSH will use billing data to analyze before and after electricity consumption patterns for a select group of program participants. GSH will also conduct in-depth interviews with a selection of program participants to gain insight on lower than anticipated program participation.

## 2.3 Large User Programs

### *2.3.1. LED Traffic Light Conversion Program*

#### Program Description

The traffic signal market in Canada as well as abroad is shifting toward low energy consuming LED technology and away from inefficient incandescent bulbs. Besides being more energy efficient, LED heads are more durable; requiring less maintenance once installed, are brighter and eliminate the need for coloured lenses. However the initial costs are substantially higher, upwards of $150 per LED head compared to $2 per incandescent bulb. The Program will be open to municipalities within the existing Greater Sudbury Hydro service area.

Several utilities in Canada, including Hydro One and Horizon Utilities, have offered or are offering incentives to replace incandescent bulbs in traffic lights to the new LED technology. Countries such as France, Belgium, Great Britain and Japan have taken advantage of the technology. Joint studies by BC Hydro, Manitoba Hydro and Natural Resources Canada have shown 85% to 95% in energy savings.

#### 2009 Highlights and Activities

Discussions with the City of Sudbury have been slower than anticipated. Dialogue and data collection are expected to continue throughout 2010.

#### Participation:

As discussions with the city continue throughout 2010, the 2009 budgeted installations are expected to take place in 2010. The table below shows both budgeted and actual installations for 2009.

**Table 2.3.1a. Program Participation (Budget vs. Actual)**

| LED Traffic Light Conversion Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Total | 274 | 0 | (274) |

**Program Costs:**

The table below shows both Board approved and actual spending for 2009.

**Table 2.3.1b. Program Costs (Budget vs. Actual)**

| LED Traffic Light Conversion Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Operating Expense | $33,927 | $558 | $33,369 |
| Capital | $0 | $0 | $0 |
| **Total** | **$33,927** | **$558** | **$33,369** |

**Savings (kWh):**

As a result of the installation delays, budgeted savings were not achieved in 2009. Savings are expected to take place in 2010.

## Planned Evaluation Activities

GSH will use billing data to analyze the City's before and after electricity consumption patterns.

### *2.3.2 West Nipissing Street Light Conversion Program*

#### Program Description

The Municipality of West Nipissing has nearly 250 mercury vapor street light fixtures ranging in size from 175W to 400W. The maintenance and operating costs for these inefficient fixtures are much higher their efficient counterpart, however budget constraints have delayed the conversion to more efficient lighting.

This program has been designed to assist the municipality of West Nipissing make more efficient purchase decisions.

#### 2009 Highlights and Activities

Discussions with the City of West Nippissing have been slower than anticipated. Dialogue and data collection are expected to continue throughout 2010.

#### Participation:

As discussions with the city continue throughout 2010, the 2009 budgeted installations are expected to take place in 2010. The table below shows both budgeted and actual installations for 2009.

**Table 2.3.2a. Program Participation (Budget vs. Actual)**

| West Nipissing Street Light Conversion Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Total | 125 | 0 | (125) |

#### Program Costs:

The table below shows both Board approved and actual spending for 2009.

**Table 2.3.2b. Program Costs (Budget vs. Actual)**

| West Nipissing Street Light Conversion Program | 2009 Budget | 2009 Actual | Variance |
|---|---|---|---|
| Operating Expense | $43,788 | $574 | $43,214 |
| Capital | $0 | $0 | $0 |
| **Total** | **$43,788** | **$574** | **$43,214** |

**Savings (kWh):**

As a result of the installation delays, budgeted savings were not achieved in 2009. Savings are expected to take place in 2010.

## Planned Evaluation Activities

No evaluation activity has been planned for this program.

## Appendix A: Final Evaluation Plan

In the Board's proposed Conservation and Demand Management Code for Electricity Distributors (Board File No.: EB-2010-0215) issued June 22nd 2010, its states that Board-Approved CDM programs are required to have an evaluation plan based on the OPA's EM&V Protocols. These protocols are guidelines that describe acceptable methods for evaluating CDM programs.

In keeping with this proposed Code, the OPA Evaluation Protocols and the draft evaluation plan submitted with the Board approved funding application[3], GSH has developed a final evaluation plan detailing planned activity for 2010 and 2011.

This goal of this activity will be to provide an overall assessment of the technologies, program delivery strategies, objectives and cost effectiveness.

| Activity | Program | 2010 | 2011 | Objectives |
|---|---|---|---|---|
| Review of prescriptive measure assumptions. | Electric Thermal Storage Unit | | X | To provide updates and identify which inputs require further review to support measure assumptions. |
| | Vending Machine and Self Service Controls | | X | |
| | Commercial Parking Lot Plug Controller | | | |
| Review of program tracking and processes. | All | X | X | Identify any problems or issues relating to data collection (i.e. participation and expenditures) and reporting processes. |
| Process Evaluations | Community Awareness Program | X | X | Conduct a random survey of Sudbury residents to explore awareness levels of CDM and the various campaigns operated throughout 2009 and 2010. |

[3] Greater Sudbury Hydro Inc., Custom Programs Conservation and Demand Management Plan for the Period 2008 to 2010, filed: June 2008.

| | | | | |
|---|---|---|---|---|
| | Electric Thermal Storage Unit | X | | Evaluation efforts will focus on marketing effectiveness, program enrollment, incentives and general feedback. Information will be obtained through a series of in-depth participant surveys.<br><br>Marketing and outreach materials utilized by EHS suppliers and installers will also be examined. |
| | Vending Machine and Self Service Controls | X | | |
| | Commercial Parking Lot Plug Controller | X | | |
| Measurement of Energy Savings and Verification of Installations | Electric Thermal Storage Unit | X | X | Site visits to verify all equipment installations.<br><br>Billing analysis using before and after electricity consumption patterns for a select group of program participants. |
| | Vending Machine and Self Service Controls | X | X | |
| | Commercial Parking Lot Plug Controller | X | X | |
| Estimation of Savings and Program Cost Effectiveness | Vending Machine and Self Service Controls | | X | Using accurate savings and cost estimates resulting from the program the overall cost effectiveness will be assessed. |
| | Commercial Parking Lot | | X | |

| | | | |
|---|---|---|---|
| | Plug Controller<br><br>LED Traffic Lights | X | |
| Estimation of Peak Demand (MW) Savings | LED Traffic Lights | X | Using annual energy savings derived from billing analysis, an estimated peak savings will be calculated. |

## Appendix B: Prescriptive Savings and Assumptions

***Electrical Thermal Storage Heating (ETS) Unit***

| **Efficient Technology & Equipment Description** |
|---|
| Electric Thermal Storage (ETS) technology stores low cost electricity in the form of heat for use in heating 24 hours a day. ETS equipment utilizes a storage medium to store heat during off-peak hours, and releasing it consistently throughout the day during the mid-peak and on-peak hours. Additionally, ETS has the ability to control electric water heaters so that they use off-peak energy to heat stored water. |
| **Base Technology & Equipment Description** |
| Standard electric heating (furnace or baseboard) with no thermal storage (load shifting) capability. |

**Resource Savings Assumptions**

**Electricity *kW or kWh***

Electric Thermal Storage heaters do not provide electricity savings but do provide substantial load shifting opportunities. Energy from electricity in the form of heat, purchased during off-peak periods at low cost is used for space heating during on-peak periods. Off-peak hours are those times during (usually at night) when electricity can be supplied most economically.

Based on manufacturer claims[4] of estimated load shifting opportunities are as follows:

| Energy Savings Winter Peak (kW.h) | Energy Savings Winter Mid (kW.h) | Energy Savings Winter Off Peak (kW.h) | Energy Savings Summer Peak (kW.h) | Energy Savings Summer Mid (kW.h) | Energy Savings Summer Off Peak (kW.h) | Energy Savings Shoulder Mid (kW.h) | Energy Savings Shoulder Off (kW.h) |
|---|---|---|---|---|---|---|---|
| 795.91 | 333.70 | (1,129.62) | 0.00 | 0.00 | 0.00 | 862.68 | (862.68) |

**Natural Gas *m3 or Btu or CFM***

Not applicable.

**Water**

Not applicable.

**Other Input Assumptions**

| **Equipment Life *years*** |
|---|
| 18 years as per Measure List assumption for Electric Storage Furnace. |

[4] http://www.steffes.com/offpeak/company/units.aspx

| **Incremental Cost *$/kW or $/kWh*** |
| --- |
| Based on manufacturer estimates the incremental cost is estimated to be approximately:<br><br>$1,250 ETS unit<br>$ 650 Electronic Controls<br>$1,000 Installation<br>**$2,900 Total** |
| **Free Ridership *%*** |
| Due to high equipment and installation costs it is expected that few customer would adopt this technology in the absence of the utility program. A 10% free ridership rate has been assumed for this program. |

## *Commercial Parking Lot Plug Controller Unit*

| **Efficient Technology & Equipment Description** |
|---|
| Parking lot controllers are electronically controlled receptacles that replace existing parking stall power outlets. The devices control the electricity going to an outdoor plug by measuring the outside temperature. With factory installed regulators, an optimum level of power is delivered to the block heaters during the winter months. |
| **Base Technology & Equipment Description** |
| Uncontrolled standard power outlet. |

**Resource Savings Assumptions**

| **Electricity *kW or kWh*** |
|---|
| Based on reported savings from Manitoba Hydro, parking lot plug controllers can reduce block heater energy consumption by 50%[5].<br><br>Average Block Heater & Interior Car Warmer Load: 1,350 W<br>Multi Res Usage Per Day: 10 hrs<br>Multi Res Usage Per Week: 7 days<br>Multi Res Usage Weeks Per Year: 16 weeks<br>Annual Hours of Use: 1,120 hours<br>Annual kWh: 1,512 kWh<br>Energy Savings (kWh) (50%): 756 kWh |

| Energy Savings Winter Peak (kW.h) | Energy Savings Winter Mid (kW.h) | Energy Savings Winter Off Peak (kW.h) | Energy Savings Summer Peak (kW.h) | Energy Savings Summer Mid (kW.h) | Energy Savings Summer Off Peak (kW.h) | Energy Savings Shoulder Mid (kW.h) | Energy Savings Shoulder Off (kW.h) |
|---|---|---|---|---|---|---|---|
| 103.90 | 114.02 | 297.00 | 0.00 | 0.00 | 0.00 | 102.03 | 139.05 |

| **Natural Gas *m3 or Btu or CFM*** |
|---|
| Not applicable. |
| **Water** |
| Not applicable. |

[5] Power Smart Profiles, Manitoba Hydro, March 2005/Apartments/Condominums No.01.

**Other Input Assumptions**

| **Equipment Life *years*** |
|---|
| An estimate of 20 years has been assumed for this technology. |
| **Incremental Cost *$/kW or $/kWh*** |
| Based on manufacturer pricing the incremental cost is estimated to be approximately:<br><br>$130 Parking Lot Controller[6] Costs representative on single unit installation. With multiple units,<br>$ 60 ESA Permit we have found that installation costs range between $25 and $38<br>$ 70 Installation per unit; and, a one time ESA permit is chargeable on entire job.<br>**$260 Total** |
| **Free Ridership *%*** |
| This technology is relatively new with few customers expected to adopt technology in the absence of the utility program. A 10% free ridership rate has been assumed for this program. |

[6] Based on IPLC model 210D, SKU: IPLC0535

## *Vending Machine Power Controller Unit*

| **Efficient Technology & Equipment Description** |
|---|
| Using smart controls to manage the power consumption of vending machines, this technology is capable of powering down when no movement is detected within 20 feet of the machine for more than 15 minutes, monitor room temperature and occupancy patterns to optimize cooling cycles and avoid heavy-use machine start ups when powered down. |
| **Base Technology & Equipment Description** |
| Vending machines without controls. |

**Resource Savings Assumptions**

**Electricity *kW or kWh***

Based on a London Hydro report[7] suggesting 45% energy savings:

Average Energy Consumption of Vending Machine: 3,500 kWh
Average Savings: 45%
Estimated Energy Savings: 1,575 kWh

| Energy Savings Winter Peak (kW.h) | Energy Savings Winter Mid (kW.h) | Energy Savings Winter Off Peak (kW.h) | Energy Savings Summer Peak (kW.h) | Energy Savings Summer Mid (kW.h) | Energy Savings Summer Off Peak (kW.h) | Energy Savings Shoulder Mid (kW.h) | Energy Savings Shoulder Off (kW.h) |
|---|---|---|---|---|---|---|---|
| 108.24 | 123.70 | 290.19 | 93.85 | 140.78 | 291.81 | 234.63 | 291.81 |

**Natural Gas *m3 or Btu or CFM***

Not applicable.

**Water**

Not applicable.

[7] System Planning Report SP04-05, Towards a Sustainable Energy Future: Master Plan of Strategies and Approaches for Energy Conservation and Demand-Side Management Investments, pg. 65.

**Other Input Assumptions**

| **Equipment Life *years*** |
|---|
| Equipment life of 18 years as per Occupancy Sensor from Measure List has been used as a proxy. |
| **Incremental Cost *$/kW or $/kWh*** |
| Based on manufacturer pricing the incremental cost is estimated to be approximately $200.00. |
| **Free Ridership *%*** |
| This technology is relatively new with few customers expected to adopt technology in the absence of the utility program. A 10% free ridership rate has been assumed for this program. |

## *LED Traffic Lights*

| **Efficient Technology & Equipment Description** |
|---|
| A Light Emitting Diode (LED) is a semiconductor device, which converts electricity into light. LEDs are small in size, but can be grouped together for higher intensity applications. Unlike incandescent lighting, LEDs do not contain a filament or wire, and as such, energy is directed to light rather than heat.<br><br>LEDs produce more light per watt of electricity than incandescent or fluorescent bulbs and last considerably longer, often twice as long as the best fluorescent bulbs and twenty times longer than the best incandescent bulbs. |
| **Base Technology & Equipment Description** |
| Conventional traffic lighting. |

**Resource Savings Assumptions**

**Electricity *kW or kWh***

Energy (kWh) and demand (kW) savings data provided by the City of Greater Grand Sudbury.

| Energy Savings Winter Peak (kW.h) | Energy Savings Winter Mid (kW.h) | Energy Savings Winter Off Peak (kW.h) | Energy Savings Summer Peak (kW.h) | Energy Savings Summer Mid (kW.h) | Energy Savings Summer Off Peak (kW.h) | Energy Savings Shoulder Mid (kW.h) | Energy Savings Shoulder Off (kW.h) |
|---|---|---|---|---|---|---|---|
| 63.22 | 72.25 | 169.49 | 54.82 | 82.23 | 170.44 | 137.04 | 170.44 |

**Natural Gas *m3 or Btu or CFM***

Not applicable.

**Water**

Not applicable.

**Other Input Assumptions**

| **Equipment Life *years*** |
| --- |
| 23 years as per Horizon Utilities 2007 Annual CDM Report. |
| **Incremental Cost *$/kW or $/kWh*** |
| Based on an average price of $350/LED head. |
| **Free Ridership *%*** |
| Assumes a free ridership rate of 30% as per Toronto Hydro EB 2007-0096 OEB Decision. |

## *Street Light Conversion*

400W Mercury Vapor converted to 250W Metal Halide Lamps for Commercial Measure List assumptions used as a proxy.