**Reply to Interrogatories of the Vulnerable Energy Consumers Coalition (VECC)**

**LRAM/SSM Evidence**

**Question 1**
**Reference: Request for LRAM and SSM Adjustments Page 4**

*a) Is Oshawa PUC aware of the document "Guidelines for Electricity Distributor Conservation and Demand Management (EB-2008-0037) dated March 28, 2008"? If so please provide Oshawa's interpretation of the requirement for an independent evaluation of results set out on Page 28.*

Section 7.5 "Independent Third Party Review" of the Guidelines for Electricity Distributor Conservation and Demand Management (EB-2008-0037), was reviewed before filing and understood to require the distributor to hire an independent third party to review evaluations for LRAM and SSM claims filed with the Board for projects funded through 3rd Tranche MARR funding. In the case of OPA funded programs, a review by the OPA is considered sufficient.

*b) Has Oshawa retained a consultant to conduct such an evaluation for its 2006 and 2007 programs whether ratepayer or OPA- funded? If not why not?*

An independent third party, the EnerSpectrum Group, reviewed the evaluations for LRAM and SSM claims filed with the OEB for the 2006 year. There was only one program change in 2007 so it was felt that the extra expense of reviewing the same programs again could not be justified. The report is attached along with the evaluation letter which accompanied it. The report is titled "Oshawa PUC Networks Inc LRAM & SSM Assessment" and can be found at page 23 of this submission.

The new program was entitled "Replaced traffic lights with LED technology" 2007 Program and is identified on Page 11 of the Oshawa PUC Networks Inc. 2009 Distribution Rate Adjustment Application (EB-2008-0205) Request for LRAM and SSM Adjustments Filing. It is recorded as being "similar to a program approved in the Toronto Hydro Decision and the same values are used for the TRC calculations". Enerspectrum performed a review of the input assumptions and used them to perform the TRC calculations. The results of the review were communicated by email. The text of the email follows.

**From:** Bart Burman [bart.burman@enerspectrum.com]
**Sent:** Tuesday, October 09, 2007 12:24 PM
**To:** Don Pitman
**Cc:** bill.hozy@enerspectrum.com
**Subject:** RE: LED Traffic Signals!
Hi Don,

Please find attached the TRC calculation for the LED Traffic Light Retrofit.

Assumptions applied include the following:

Traffic lights assumed to operate 24/7. Therefore average annual kW saved = (245,340 - 19,959)/8760 = 25.7 kW. Note that the total cost of the project is applied in the TRC calculation. The OPUCN portion would be double counting and is therefore excluded. For the ten year period specified, the TRC results in a positive net present value of $6.3 k.

Please call if any questions or concerns.

Regards,

*Bart Burman*
*Managing Partner*
*EnerSpectrum Group*
*www.enerspectrum.com*
*416 219 9976*

c) *If Oshawa has retained a third party to conduct such an evaluation for its 2006 and 2007 programs, when will the report be filed?*

This report is filed with this Response. It is titled "Oshawa PUC Networks Inc LRAM & SSM Assessment".

d) *If Oshawa has not retained a third party to conduct an evaluation of its 2006 and 2007 programs what is the basis of the verification of the results for the 2006/2007 LRAM/.SSM claims?*

Oshawa retained the Enerspectrum Group to verify these results.

**Question 2**
**Reference: Request for LRAM and SSM Adjustments Page 5 and Page 8 -2006 Programs**

a) *With regard to the gross savings for measures installed in 2006 provide a copy of the direction(s) from OPA that set out the measure input assumptions and the full set of assumptions for*
    i. *Spring 2006 Campaign*
    ii. *Summer/Fall 2006*

Please see attached Every Kilowatt Counts "Total Resources Cost Test Calculator" as provided by OPA and SeeLine Group Ltd. A copy of the calculator can be found at page 32 of this submission. The same calculator was used for both campaigns.

*b) For 3rd tranche MARR 2006 programs provide a copy of any correspondence with the Board that indicates acceptance of the results.*

OPUCN complied with the OEB reporting requirements for our 3rd tranche MARR funded programs. Our understanding is that the Board has not provided specific approvals for the reports for any distributor.

*c) For OPA-funded 2006 and 2007 Programs provide a copy of any correspondence that indicates OPA has accepted the results.*

Oshawa used the information supplied by the OPA and reviewed by the SeeLine Group, including the TRC Calculator supplied. We have assumed that use of this information implies acceptance. Our understanding is that the OPA has not provided specific approvals for the results for any distributor.

**Question 3**

**Reference: Request for LRAM and SSM Adjustments Page 11**

*a) With respect to the replacement of bulk residential meters with individual units provide a copy of the Enerspectrum input assumptions and savings estimates including sources of data*

The input assumptions used by Enerspectrum are as follows.

| Assumption | Value | Source |
|---|---|---|
| Savings per year per unit installed | 600 kWh | OEB Total Resource Guide, Section 5, Assumptions and Measures List |
| Technology life | 20 years | OEB Total Resource Guide, Section 5, Assumptions and Measures List |

| | | |
|---|---|---|
| Free ridership | 0% | OEB Total Resource Guide, Section 5, Assumptions and Measures List |
| # of units installed | 8 | OPUCN |
| Discount rate (approved WACC) | 8.13% | OPUCN |

*b) With respect to the 15w CFL socket replacement, provide a copy of the Enerspectrum assumptions and savings estimates, including sources of data.*

| Assumption | Value | Source |
|---|---|---|
| Savings per year per unit installed | 172 kWh | OEB Total Resource Guide, Section 5, Assumptions and Measures List |
| Technology life | 8000 hrs | OEB Total Resource Guide, Section 5, Assumptions and Measures List |
| Free ridership | 10% | OEB Total Resource Guide, Section 5, Assumptions and Measures List |
| # of units installed | 610 | OPUCN |
| Discount rate (approved WACC) | 8.13% | OPUCN |

*c) With respect to LED traffic light replacement confirm that the units were fully operational in 2007 and how many months of operation were achieved in 2007?*

The LED traffic light replacement project was a joint initiative with the City of Oshawa where OPUCN contributed funds to a project managed by the City. City staff has indicated that the lights were all installed over a period of four months and the installation was completed in September 2007.

*d) With respect to LED traffic light replacement confirm if the units operated beyond December 2007 and whether they were/are fully operational in 2008.*

The units are still operational.

*e) For the following measures provide a copy of the OEB CDM TRC Guide (dated October 2006) Section 5 with the annual kwh savings highlighted*

*i. Dimmer Switches,*
*ii. Outdoor Motion Detectors*
*iii. Programmable Thermostats and*
*iv. Baseboard Programmable Thermostats*

*Reconcile any differences with the kwh savings shown in the Table on pages 8-9.*

This information is in the following table.

Determinates for LRAM and SSM

Question # 3 e.

| Rate Class | Program | Technology | Year Implemented | # of Units | Total Energy Savings (kWh) before FR | Total Energy Savings (kWh) before FR with # Units | Free Ridership | Net kWh or kW Saved (After FR) | Rate/ kWh 2006 | Lost Revenue 2006 | Rate/ kWh 2007 | Lost Revenue 2007 | Total Lost Revenue |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LRAM Per Page 8 of Filing | | | | | | | | | | | | | |
| Residential | OPA EKC Pgm Coupons (Su | Dimmers | 2006 | 326 | 183 | 59,658 | 10% | 53,692 | $ 0.0107 | $ 574.51 | 0.0108 | $ 579.88 | $ 1,154.38 |
| Residential | OPA EKC Pgm Coupons (Su | Motion Sensors | 2006 | 101 | 209 | 21,109 | 10% | 18,998 | $ 0.0107 | $ 203.28 | 0.0108 | $ 205.18 | $ 408.46 |
| Residential | OPA EKC Pgm Coupons (Su | Programmable Thermost | 2006 | 792 | 159 | 125,928 | 5% | 119,632 | $ 0.0107 | $ 1,280.06 | 0.0108 | $ 1,292.02 | $ 2,572.08 |
| Residential | OPA EKC Pgm Coupons (Su | Baseboard Programmabl | 2006 | 83 | 42 | 3,486 | 10% | 3,137 | $ 0.0107 | $ 33.57 | 0.0108 | $ 33.88 | $ 67.45 |
| | | | | | | 210,181 | | 195,459 | | $ 2,091.41 | | $ 2,110.96 | $ 4,202.37 |
| LRAM Per Question 3 e) request | | | | | | | | | | | | | |
| Residential | OPA EKC Pgm Coupons (Su | Dimmers | 2006 | 326 | 139 | 45,314 | 10% | 40,783 | $ 0.0107 | $ 436.37 | 0.0108 | $ 440.45 | $ 876.83 |
| Residential | OPA EKC Pgm Coupons (Su | Motion Sensors | 2006 | 101 | 209 | 21,109 | 10% | 18,998 | $ 0.0107 | $ 203.28 | 0.0108 | $ 205.18 | $ 408.46 |
| Residential | OPA EKC Pgm Coupons (Su | Programmable Thermost | 2006 | 792 | 159 | 125,928 | 10% | 113,335 | $ 0.0107 | $ 1,212.69 | 0.0108 | $ 1,224.02 | $ 2,436.71 |
| Residential | OPA EKC Pgm Coupons (Su | Baseboard Programmabl | 2006 | 83 | 243 | 20,169 | 10% | 18,152 | $ 0.0107 | $ 194.23 | 0.0108 | $ 196.04 | $ 390.27 |
| | | | | | | 212,520 | | 191,268 | | $ 2,046.57 | | $ 2,065.69 | $ 4,112.26 |
| | | Differences | | | | (2,339) | | $ 4,191 | | $ 45 | | $ 45 | $ 90 |

**Question 4**

**Reference: Request for LRAM and SSM Adjustments Page 12 and Pages 20-23**

a) *Provide annual totals for kwh savings for each of 2006 and 2007.*

Annual savings for 2006, net of free ridership = 6,289,536 kwh
Annual savings for 2007, net of free ridership = 5,258,902

b) *Explain why the effectiveness of the 2006 measures should not be prorated to reflect actual operation during 2006.*

OPUCN has complied with the requirements for CDM filing application requirements of the OEB. There is no approved method for performing the type of proration suggested. This could be in part because many of the CDM programs relate to installations and operations over various periods of time for which identification of the exact date of operation or amount of operation cannot be determined. For example, the OPA Coupon program for CFLs extended over a six month period of time and there is not way to determine when a light bulb was actually brought into use. The same is true for most programs which depend on consumer behaviour. It is our understanding that these factors, and other like them, were taken into account when the estimates for kwh savings, technology life and other parameters of the TRC calculations were set.

c) *Provide an estimate of the prorated effective kwh savings for 2006 based on estimated timing of installations and operation.*

Oshawa has not prorated the savings and has no way to estimate the timing of the installation and operation of the various technologies.

d) *For 2007 provide an estimate of effective kwh savings assuming that measures/units installed in 2006 continue in 2007 and that new measures/units installed in 2007 are partially effective based on estimated dates of installation.*

See response above (item b).

*e) Provide a schedule that translates the prorated net effective kwh for each year to arrive at an LRAM amount for each of 2006 and 2007 in a similar format to the Table on page 7*

See response above (item b)

*f) Provide an estimate of the savings and LRAM for 2006 using the OPA input assumptions for the Spring and Summer/Fall 2007 campaigns as shown on page 10*

The following table contains this information.

Question 4 f) LRAM for 2006 (Using OPA input assumptions Spring/ Fall 2007)

| | | | | | | | | | | | | | LRAM | | | | SSM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rate Class | Source (including Life/ Energy | Program | Technology | Funding Mechanism | Year Implemented | # of Units | Duration of Program | Measure Life | Total Energy Savings (kWh) | Total Energy Savings (kW) | Total Energy Savings (kWh) | Free Ridership | Net kWh or kW Saved (After FR) | Rate/ kWh 2006 | Lost Revenue 2006 | Rate/ kWh 2007 | Lost Revenue 2007 |
| Residential | t (TRC Test | OPA EKC Pgm Coupons (Sprin | CFL 15 w Screw in | OPA | 2006 | 5,436 | Months (Estima | 6 | 171.0 | 0 | 929,545 | 30% | 650,682 | $ 0.0107 | $ 6,962.29 | 0.0108 | $ 7,027.36 |
| Residential | t (TRC Test | OPA EKC Pgm Coupons (Sprin | Ceiling Fans | OPA | 2006 | 226 | Months (Estima | 20 | 102.4 | 3 | 23,142 | 30% | 16,200 | $ 0.0107 | $ 173.34 | 0.0108 | $ 174.96 |
| Residential | t (TRC Test | OPA EKC Pgm Coupons (Sprin | Timers | OPA | 2006 | 416 | Months (Estima | 20 | 182.5 | 0 | 75,920 | 30% | 53,144 | $ 0.0107 | $ 568.64 | 0.0108 | $ 573.96 |
| Residential | t (TRC Test | OPA EKC Pgm Coupons (Sprin | Pstats (space heating, space co | OPA | 2006 | 315 | Months (Estima | 18 | 29.6 | 14 | 9,324 | 30% | 6,527 | $ 0.0107 | $ 69.84 | 0.0108 | $ 70.49 |
| Residential | )EB Web Sit | OPA EKC Pgm Coupons (Sumr | CFL 15 w Screw in | OPA | 2006 | 8,247 | Months (Estima | 6 | 171.0 | 0 | 1,410,221 | 30% | 987,154 | $ 0.0107 | $ 10,562.55 | 0.0108 | $ 10,661.27 |
| Residential | )EB Web Sit | OPA EKC Pgm Coupons (Sumr | Dimmers | OPA | 2006 | 326 | Months (Estima | 10 | 23.7 | 3 | 7,726 | 30% | 5,408 | $ 0.0107 | $ 57.87 | 0.0108 | $ 58.41 |
| Residential | )EB Web Sit | OPA EKC Pgm Coupons (Sumr | Motion Sensors | OPA | 2006 | 101 | Months (Estima | 20 | 161.1 | 12 | 16,271 | 30% | 11,390 | $ 0.0107 | $ 121.87 | 0.0108 | $ 123.01 |
| Residential | )EB Web Sit | OPA EKC Pgm Coupons (Sumr | Programmable Thermostates | OPA | 2006 | 792 | Months (Estima | 15 | 29.6 | 0 | 23,443 | 30% | 16,410 | $ 0.0107 | $ 175.59 | 0.0108 | $ 177.23 |
| Residential | )EB Web Sit | OPA EKC Pgm Coupons (Sumr | Baseboard Programmable The | OPA | 2006 | 83 | Months (Estima | 18 | 29.6 | 0 | 2,457 | 30% | 1,720 | $ 0.0107 | $ 18.40 | 0.0108 | $ 18.57 |
| Residential | )EB Web Sit | OPA EKC Pgm Coupons (Sumr | Seasonal LEDS | OPA | 2006 | 5,197 | Months (Estima | 5 | 13.7 | 41 | 71,199 | 30% | 49,839 | $ 0.0107 | $ 533.28 | 0.0108 | $ 538.26 |
| | | | Totals | | | | | | | | 2,569,248 | | 1,798,474 | | $ 19,243.67 | | $ 19,423.52 |

**OPA Assumption uses different Measure Life than that of OEB TRC (and is not accounted for in above assumptions)

Programmable Thermostates (Cannot identify category in Spring and Summer / Fall 2007 OPA Program Calculations

Timers (Cannot identify category in Spring and Summer / Fall 2007 OPA Program Calculations

**Campaign Input assumpti**

| Product | Annual kWl | Peak Demand Reductions KW / L | Total Coupons | Units / Cou | Estimated L | Free Ridership |
|---|---|---|---|---|---|---|
| Energy Star CFL 15W | 44.3 | 0.0017 | 493775 | 3.86 | 6 | 30% |
| Energy Star Ceiling Fan | 102.4 | 0.004 | 19166 | 1 | 10 | 30% |
| Outdoor Motion Sensor | 161.1 | 0 | 23474 | 1 | 10 | 30% |
| Dimmer Switch | 23.7 | 0.001 | 19390 | 1 | 10 | 30% |
| Outdoor Solar Lights | 9.8 | 0 | 598079 | 1 | 5 | 30% |
| Furnace / AC Filter | 105.42 | 0.05 | 25742 | 1 | 1 | 30% |
| Electric Furnace | 850.1 | 0 | | 5% | | |
| Natural Gas Furnace | 60.6 | 0.089 | | 57% | | |
| Central AC | 70 | 0 | | 45% | | |
| | | | | | | |
| Energy Star CFL 15W | 44.3 | 0.0017 | 816903 | 3.86 | 6 | 30% |
| Seasonal LEDs (SLEDs) | 13.7 | 0 | 614431 | 1 | 5 | 30% |
| T-8 Fixtures | 37.2 | 0.0015 | 18140 | 1 | 16 | 30% |
| Energy Star Lighting Fixtur | 124.9 | 0.004 | 8405 | 1 | 20 | 30% |
| Baseboard Programmable | 29.6 | 0 | 18580 | 1 | 15 | 30% |
| Lighting and Appliance Cor | 86.6 | 0.002 | 97853 | 1 | 13 | 30% |
| Power Bar with Integrated | 72.4 | 0.0077 | 8486 | 1 | 10 | 30% |

**Question 5**

**Reference: Request for LRAM and SSM Adjustments Page 10**

a) *Provide similar schedules to the OPA 2007 programs shown on page 10 for the OPA 2006 Spring Summer /Fall campaigns*

b) *Provide similar schedules for the 2006 OEB 3rd tranche MARR programs*

c) *To each schedule including OPA 2007 programs add a column that shows the effective net kwh savings and reconcile any differences with the estimates in the Table on page 12 and the Tables shown on Pages 20-23*

The following tables contain the information requested.

Question 5 a) LRAM for 2006 (Using OPA input assumptions Spring/ Fall 2006)

| Rate Class | Source (including Life/ Energy Savings) | Program | Technology | Funding Mechanism | Year Implemented | # of Units | Estimated Duration of Program | Measure Life | Total Energy Savings (kWh) | Total Energy Savings (kW) | Total Energy Savings (kWh) | Free Ridership | Net kWh or kW Saved (After FR) | LRAM Rate/ kWh 2006 | LRAM Lost Revenue 2006 | LRAM Rate/ kWh 2007 | LRAM Lost Revenue 2007 | LRAM Total Lost Revenue |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Residential | OPA Report | EKC Spring (2007) | Ceiling Fans | OPA 2007 | 2007 | 325 | 3 Months | 10 | 141.0 | 1 | 45,825 | 10% | 41,243 | $ - | $ - | 0.0108 | $ 445.42 | $ 445.42 |
| Residential | OPA Report | EKC Spring (2007) | Furnance Filters | OPA 2007 | 2007 | 455 | 3 Months | 1 | 30.0 | 0 | 13,650 | 10% | 12,285 | $ - | $ - | 0.0108 | $ 132.68 | $ 132.68 |
| Residential | OPA Report | EKC Spring (2007) | Outdoor Motion Sensors | OPA 2007 | 2007 | 466 | 3 Months | 10 | 209.0 | 0 | 97,394 | 10% | 87,655 | $ - | $ - | 0.0108 | $ 946.67 | $ 946.67 |
| Residential | OPA Report | EKC Spring (2007) | Outdoors Solar Lights | OPA 2007 | 2007 | 8,758 | 3 Months | 5 | 23.0 | 0 | 201,434 | 10% | 181,291 | $ - | $ - | 0.0108 | $ 1,957.94 | $ 1,957.94 |
| Residential | OPA Report | EKC Spring (2007) | Dimmer Switches | OPA 2007 | 2007 | 115 | 3 Months | 10 | 183.0 | 0 | 21,045 | 10% | 18,941 | $ - | $ - | 0.0108 | $ 204.56 | $ 204.56 |
| Residential | OPA Report | EKC Spring (2007) | CFL 15 w Screw in | OPA 2007 | 2007 | 40,718 | 3 Months | 6 | 104.0 | 0 | 4,234,628 | 10% | 3,811,165 | $ - | $ - | 0.0108 | $ 41,160.58 | $ 41,160.58 |
| Residential | OPA Report | EKC Summer (2007) | CFL 15 w Screw in | OPA 2007 | 2007 | 48,696 | 6 Months | 6 | 104.0 | 1 | 5,064,353 | 10% | 4,557,918 | $ - | $ - | 0.0108 | $ 49,225.51 | $ 49,225.51 |
| Residential | OPA Report | EKC Summer (2007) | T-8 Fixtures | OPA 2007 | 2007 | 142 | 7 Months | 16 | 288.0 | 0 | 40,896 | 0% | 40,896 | $ - | $ - | 0.0108 | $ 441.68 | $ 441.68 |
| Residential | OPA Report | EKC Summer (2007) | Lighting and Appliance Control Devises | OPA 2007 | 2007 | 1,685 | 8 Months | 13 | 10.0 | 3 | 16,850 | 10% | 15,165 | $ - | $ - | 0.0108 | $ 163.78 | $ 163.78 |
| Residential | OPA Report | EKC Summer (2007) | Power Bar with Integrated Timer | OPA 2007 | 2007 | 206 | 9 Months | 10 | 10.0 | 2 | 2,060 | 10% | 1,854 | $ - | $ - | 0.0108 | $ 20.02 | $ 20.02 |
| Residential | OPA Report | EKC Summer (2007) | Baseboard Programmable Thermostats | OPA 2007 | 2007 | 169 | 10 Months | 15 | 42.0 | 0 | 7,098 | 10% | 6,388 | $ - | $ - | 0.0108 | $ 68.99 | $ 68.99 |
| Residential | OPA Report | EKC Summer (2007) | LEDs | OPA 2007 | 2007 | 9,047 | 11 Months | 30 | 19.0 | 0 | 171,893 | 5% | 163,298 | $ - | $ - | 0.0108 | $ 1,763.62 | $ 1,763.62 |
| | | | Totals | | | | | | | | 9,917,126 | | 8,938,097 | | | | $ 96,531.45 | $ 96,531.45 |

OPA Assumptions 2006

| Technology | Energy Savings (kWh) | Free Ridership Allowance |
|---|---|---|
| CFL 15 w Screw in light bulbs | 104 | 10% |
| Energy Star Ceiling Fans | 141 | 10% |
| Timers | 183 | 10% |
| Programmable thermostats for spac | 218 | 10% |

| Technology | Energy Savings (kWh) | Free Ridership Allowance |
|---|---|---|
| CFL 15 w Screw in light bulbs | 104 | 10% |
| Dimmer Switches | 183 | 10% |
| Outdoor Motion Sensors | 209 | 10% |
| Programmable Thermostats | 159 | 5% |
| Baseboard Programmable Thermost | 42 | 10% |
| Seasonal LED lights | 19 | 5% |
| T8 lighting | 288 | 0% |
| Exit light replacement | 237 | 10% |
| Christmas light retrofit | 19 | 5% |

Question 5 b) LRAM for 2006 (Using OPA input assumptions Spring/ Fall 2006)

| Rate Class | Source (including Life/ Energy Savings) | Program | Technology | Funding Mechanism | Year Implemented | # of Units | Duration of Program | Measure Life | Total Energy Savings (kWh) | Total Energy Savings (kW) | Total Energy Savings (kWh) | Free Ridership | Net kWh or kW Saved (After FR) | LRAM | | | | | SSM | | | Incremental Equipment Costs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Rate/ kWh 2006 | Lost Revenue 2006 | Rate/ kWh 2007 | Lost Revenue 2007 | Total Lost Revenue | NPV$ | SSM Rate | SSM Applied | |
| Residential | OEB Web Site | Library Watt-Reader Program | CFL 15 w Screw in | 3rd Tranche MARR | 2006 | 140 | 6 Month | 4 | 104 | 3 | 14,560 | 10% | 13,104 | $ 0.0107 | $ 140.21 | 0.0108 | $ 141.52 | $ 281.74 | $ 3,100.00 | 5% | $ 155.00 | |
| Residential | OEB Web Site | Retrofit Non-Profit Housing | T8s | 3rd Tranche MARR | 2006 | 143 | 1 Month | 5 | 288 | 11 | 41,184 | 0% | 41,184 | $ 0.0107 | $ 440.67 | 0.0108 | $ 444.79 | $ 885.46 | $ 7,800.00 | 5% | $ 390.00 | 6800 |
| Residential | OEB Web Site | Retrofit Non-Profit Housing | CFLs | 3rd Tranche MARR | 2006 | 610 | 1 Month | 4 | 104 | 21 | 63,440 | 10% | 57,096 | $ 0.0107 | $ 610.93 | 0.0108 | $ 616.64 | $ 1,227.56 | $ 11,000.00 | 5% | $ 550.00 | 400 |
| Residential | pectrum Group R | Retrofit Non-Profit Housing | 15 W CFL Socket Replace | 3rd Tranche MARR | 2006 | 56 | 1 Month | 2.5 | 174 | 2 | 9,744 | 10% | 8,770 | $ 0.0107 | $ 93.83 | 0.0108 | $ 94.71 | $ 188.55 | $ 14,000.00 | 5% | $ 700.00 | 2200 |
| Residential | OEB Web Site | Retrofit Non-Profit Housing | Exit Lights | 3rd Tranche MARR | 2006 | 60 | 1 Month | 25 | 237 | 1 | 14,220 | 10% | 12,798 | $ 0.0107 | $ 136.94 | 0.0108 | $ 138.22 | $ 275.16 | $ 9,200.00 | 5% | $ 460.00 | 5000 |
| Residential | OEB Web Site | Retrofit Non-Profit Housing | Christmas Light Retrofit | Tranche MARR | 2006 | 900 | 1 Month | 30 | 19 | 2 | 17,100 | 5% | 16,245 | $ 0.0107 | $ 173.82 | 0.0108 | $ 175.45 | $ 349.27 | $ 11,600.00 | 5% | $ 580.00 | 1700 |
| Residential | pectrum Group R | Residential Replace Bulk with Individual Meters | Individual Meters | 3th Tranche MARR | 2006 | 8 | 1 Month | 20 | 240 | 2 | 4,800 | 0% | 4,800 | $ 0.0107 | $ 51.36 | 0.0108 | $ 51.84 | $ 103.20 | $ 1,700.00 | 5% | $ 85.00 | 3200 |
| | | | Totals | | | | | | | | 165,048 | | 153,997 | | 1,648 | | 1,663 | | | | | |

VECC Response Q 5 c)

**Table 2: CDM Load Impacts by Program and Class**

| Rate Class | Program | CDM Report Year | kWh Saving (Net of FR) | As per VECC Request kWh Saving (Net of FR) |
|---|---|---|---|---|
| **Residential** | | | | |
| | Library Watt- Reader Program | 2006 | 13,104 | 13,104 |
| | OPA EKC Pgm Coupons (Spring 2006) | 2006 | 2,036,256 | 650,682 |
| | OPA EKC Pgm Coupons (Spring 2006) | 2006 | 571,961 | 16,200 |
| | OPA EKC Pgm Coupons (Spring 2006) | 2006 | 1,366,560 | 53,144 |
| | OPA EKC Pgm Coupons (Spring 2006) | 2006 | 1,112,487 | 6,527 |
| | OPA EKC Pgm Coupons (Summer/ Fall 20 | 2006 | 771,919 | 987,154 |
| | OPA EKC Pgm Coupons (Summer/ Fall 20 | 2006 | 40,783 | 5,408 |
| | OPA EKC Pgm Coupons (Summer/ Fall 20 | 2006 | 18,998 | 11,390 |
| | OPA EKC Pgm Coupons (Summer/ Fall 20 | 2006 | 119,632 | 16,410 |
| | OPA EKC Pgm Coupons (Summer/ Fall 20 | 2006 | 3,137 | 1,720 |
| | OPA EKC Pgm Coupons (Summer/ Fall 20 | 2006 | 93,806 | 49,839 |
| | Retrofit Non-Profit Housing | 2006 | 41,184 | 41,184 |
| | Retrofit Non-Profit Housing | 2006 | 57,096 | 57,096 |
| | Retrofit Non-Profit Housing | 2006 | 8,770 | 8,770 |
| | Retrofit Non-Profit Housing | 2006 | 12,798 | 12,798 |
| | Retrofit Non-Profit Housing | 2006 | 16,245 | 16,245 |
| | Residential Replace Bulk with Individual | 2006 | 4,800 | 4,800 |
| | OPA EKC Pgm Coupons (Spring 2007) | 2007 | 33,280 | 41,243 |
| | OPA EKC Pgm Coupons (Spring 2007) | 2007 | 47,966 | 12,285 |
| | OPA EKC Pgm Coupons (Spring 2007) | 2007 | 75,073 | 87,655 |
| | OPA EKC Pgm Coupons (Spring 2007) | 2007 | 85,828 | 181,291 |
| | OPA EKC Pgm Coupons (Spring 2007) | 2007 | 2,726 | 18,941 |
| | OPA EKC Pgm Coupons (Spring 2007) | 2007 | 1,803,789 | 3,811,165 |
| | OPA EKC Pgm Coupons (Summer / Fall 2( | 2007 | 2,157,220 | 4,557,918 |
| | OPA EKC Pgm Coupons (Summer / Fall 2( | 2007 | 5,282 | 40,896 |
| | OPA EKC Pgm Coupons (Summer / Fall 2( | 2007 | 145,921 | 15,165 |
| | OPA EKC Pgm Coupons (Summer / Fall 2( | 2007 | 14,914 | 1,854 |
| | OPA EKC Pgm Coupons (Summer / Fall 2( | 2007 | 5,002 | 6,388 |
| | OPA EKC Pgm Coupons (Summer / Fall 2( | 2007 | 123,944 | 163,298 |
| | Subtotal | | 10,790,480 | 10,890,568 |
| **Unmetered Scattered Load** | | | | |
| | Retro Fit Traffic Signal Lights with LED Fi | 2007 | 757,957 | 757,957 |
| | Subtotal | | 757,957 | 757,957 |
| | Total | | 11,548,437 | 11,648,525 |

VECC Response Q 5 c)

| | | | | | As Filed | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Source (including Life/ Energy Savings)** | **Program** | **Technology** | **Funding Mechanism** | **Year Implemented** | **# of Units** | **Duration of Program** | **Measure Life** | **Total Energy Savings (kWh) before FR** | **Total Energy Savings (kW)** | **Total Energy Savings (kWh) before FR with # Units** | **Free Ridership** | **Net kWh or kW Saved (After FR)** | **As per VECC RequestNet kWh or kW Saved (After FR)** |
| **Rate Class: Residential** | | | | | | | | | | | | | |
| OEB Web Site | Library Watt- Reader Program | CFL 15 w Screw in | 3rd Tranche MARR | 2006 | 140 | 6 Month | 4 | 104 | 3 | 14,560 | 10% | 13,104 | 13,104 |
| OPA TRC Calculator | OPA EKC Spring 2006 | CFL 15 w Screw in | OPA 2006 | 2006 | 5,436 | Months (Estima | 4 | 104 | 0 | 2,262,507 | 10% | 2,036,256 | 650,682 |
| OPA TRC Calculator | OPA EKC Spring 2006 | Ceiling Fans | OPA 2006 | 2006 | 226 | Months (Estima | 20 | 141 | 3 | 635,512 | 10% | 571,961 | 16,200 |
| OPA TRC Calculator | OPA EKC Spring 2006 | Timers | OPA 2006 | 2006 | 416 | Months (Estima | 20 | 183 | 0 | 1,518,400 | 10% | 1,366,560 | 53,144 |
| OPA TRC Calculator | OPA EKC Spring 2006 | Pstats (space heating, space cooling) | OPA 2006 | 2006 | 315 | Months (Estima | 18 | 218 | 14 | 1,236,097 | 10% | 1,112,487 | 6,527 |
| OEB Web Site | OPA EKC Summer 2006 | CFL 15 w Screw in | OPA 2006 | 2006 | 8,247 | Months (Estima | 4 | 104 | 0 | 857,688 | 10% | 771,919 | 987,154 |
| OEB Web Site | OPA EKC Summer 2006 | Dimmers | OPA 2006 | 2006 | 326 | Months (Estima | 10 | 139 | 3 | 45,314 | 10% | 40,783 | 5,408 |
| OEB Web Site | OPA EKC Summer 2006 | Motion Sensors | OPA 2006 | 2006 | 101 | Months (Estima | 20 | 209 | 12 | 21,109 | 10% | 18,998 | 11,390 |
| OEB Web Site | OPA EKC Summer 2006 | Programmable Thermostates | OPA 2006 | 2006 | 792 | Months (Estima | 18 | 159 | 0 | 125,928 | 5% | 119,632 | 16,410 |
| OEB Web Site | OPA EKC Summer 2006 | Baseboard Programmable Thermostats | OPA 2006 | 2006 | 83 | Months (Estima | 18 | 42 | 0 | 3,486 | 10% | 3,137 | 1,720 |
| OEB Web Site | OPA EKC Summer 2006 | Seasonal LEDS | OPA 2006 | 2006 | 5,197 | Months (Estima | 20 | 19 | 41 | 98,743 | 5% | 93,806 | 49,839 |
| OEB Web Site | Retrofit Non-Profit Housing | T8s | 3rd Tranche MARR | 2006 | 143 | 1 Month | 5 | 288 | 11 | 41,184 | 0% | 41,184 | 41,184 |
| OEB Web Site | Retrofit Non-Profit Housing | CFLs | 3rd Tranche MARR | 2006 | 610 | 1 Month | 4 | 104 | 21 | 63,440 | 10% | 57,096 | 57,096 |
| EnerSpectrum Group | Retrofit Non-Profit Housing | 15 W CFL Socket Replace | 3rd Tranche MARR | 2006 | 56 | 1 Month | 2.5 | 174 | 2 | 9,744 | 10% | 8,770 | 8,770 |
| OEB Web Site | Retrofit Non-Profit Housing | Exit Lights | 3rd Tranche MARR | 2006 | 60 | 1 Month | 25 | 237 | 1 | 14,220 | 10% | 12,798 | 12,798 |
| OEB Web Site | Retrofit Non-Profit Housing | Christmas Light Retrofit | 3rd Tranche MARR | 2006 | 900 | 1 Month | 30 | 19 | 2 | 17,100 | 5% | 16,245 | 16,245 |
| EnerSpectrum Group | Residential Replace Bulk with Individual Meters | Individual Meters | 3th Tranche MARR | 2006 | 8 | 1 Month | 20 | 240 | 2 | 4,800 | 0% | 4,800 | 4,800 |
| OPA Costs Report | OPA EKC Spring 2007 | Ceiling Fans | OPA 2007 | 2007 | 325 | Months (Estima | 10 | 15 | 1 | 47,543 | 30% | 33,280 | 41,243 |
| OPA Costs Report | OPA EKC Spring 2007 | Furnance Filters | OPA 2007 | 2007 | 455 | Months (Estima | 5 | 30 | 0 | 68,523 | 30% | 47,966 | 12,285 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OPA Costs Report | OPA EKC Spring 2007 | Outdoor Motion Sensors | OPA 2007 | 2007 | 466 | Months (Estima | 10 | 23 | 0 | 107,247 | 30% | 75,073 | 87,655 |
| OPA Costs Report | OPA EKC Spring 2007 | Outdoors Solar Lights | OPA 2007 | 2007 | 8,758 | Months (Estima | 5 | 3 | 0 | 122,612 | 30% | 85,828 | 181,291 |
| OPA Costs Report | OPA EKC Spring 2007 | Dimmer Switches | OPA 2007 | 2007 | 115 | Months (Estima | 10 | 3 | 0 | 3,894 | 30% | 2,726 | 18,941 |
| OPA Costs Report | OPA EKC Spring 2007 | CFL 15 w Screw in | OPA 2007 | 2007 | 40,718 | Months (Estima | 4 | 16 | 69 | 2,576,841 | 30% | 1,803,789 | 3,811,165 |
| OPA Costs Report | OPA EKC Summer 2007 | CFL 15 w Screw in | OPA 2007 | 2007 | 48,696 | Months (Estima | 4 | 16 | 83 | 3,081,742 | 30% | 2,157,220 | 4,557,918 |
| OPA Costs Report | OPA EKC Summer 2007 | T-8 Fixtures | OPA 2007 | 2007 | 142 | Months (Estima | 5 | 11 | 0 | 7,546 | 30% | 5,282 | 40,896 |
| OPA Costs Report | OPA EKC Summer 2007 | Lighting and Appliance Control Devises | OPA 2007 | 2007 | 1,685 | Months (Estima | 13 | 10 | 3 | 208,459 | 30% | 145,921 | 15,165 |
| OPA Costs Report | OPA EKC Summer 2007 | Power Bar with Integrated Timer | OPA 2007 | 2007 | 206 | Months (Estima | 10 | 10 | 2 | 21,306 | 30% | 14,914 | 1,854 |
| OPA Costs Report | OPA EKC Summer 2007 | Baseboard Programmable Thermostats | OPA 2007 | 2007 | 169 | Months (Estima | 18 | 2 | 0 | 7,146 | 30% | 5,002 | 6,388 |
| OPA Costs Report | OPA EKC Summer 2007 | LEDs | OPA 2007 | 2007 | 9,047 | Months (Estima | 30 | 1 | 0 | 177,063 | 30% | 123,944 | 163,298 |
| **Rate Class: Unmetered Scattered Load** | | | | | | | | | | | | | |
| EnerSpectrum Group | Retro Fit Traffic Signal Lights with LED Fixtures | LED Fixtures (Note 1) | 3rd Tranche MARR | 2007 | 156 | Months (Estima | 10 | 6941 | 87 | 1,082,796 | 30% | 757,957 | 757,957 |
| Totals | | | | | | | | | | 14,482,549 | | 11,548,437 | 11,648,525 |

Note 1: Freerider rate of 30% used in SSM and LRAM was based on Toronto Hydro decision.

**Question 6**

**Reference: Request for LRAM and SSM Adjustments Page 17**

a) *Provide a complete expanded schedule that shows the details of the Net TRC calculations for the SSM claim.( An example would be Hydro Ottawa EB-2008-0188 Attachment E*

This table follows.

| | Comments | Rate Class | Free Ridership Percentage | Annual Gross kWh | Annual Net kWh | Gross kW | Net kW | NPV Electricity |
|---|---|---|---|---|---|---|---|---|
| Library Watt- Reader Program | OEB Web Site | Residential | 10% | 14,560 | 13,104 | 3 | 3 | 4 |
| CFL 15 w Screw in | | | | | | | | |
| | | | | | | | | |
| Retrofit Non-Profit Housing | | | | | | | | |
| T8s | OEB Web Site | Residential | 0% | 41,184 | 41,184 | 11 | 11 | |
| CFLs | OEB Web Site | Residential | 10% | 63,440 | 57,096 | 21 | 19 | 4 |
| 15 W CFL Socket Replace | EnerSpectrum Group Report | Residential | 10% | 9,744 | 8,770 | 2 | 2 | 2.5 |
| Exit Lights | OEB Web Site | Residential | 10% | 14,220 | 12,798 | 1 | 1 | 25 |
| Christmas Light Retrofit | OEB Web Site | Residential | 5% | 17,100 | 16,245 | 2 | 2 | 30 |
| Individual Meters | EnerSpectrum Group Report | Residential | 0% | 4,800 | 4,800 | 2 | 2 | 20 |
| | | | | | | | | |
| Retro Fit Traffic Signal Lights with LED Fixtures | | | | | | | | |
| LED Fixtures (Note 1) | EnerSpectrum Group Report | Unmetered Scattered Lo | 30% | 1,082,796 | 757,957 | 87 | 61 | 10 |
| **Totals** | | | | **1,247,844** | **911,954** | **129** | **100** | **96** |

| | Total Customer Incremental Costs | Total Program Delivery Costs | TRC Costs (NPV) | TRC Benefits (NPV) | TRC Net Benefits (NPV) | TRC Benefit Cost Ratio | Total Incentives (not included in TRC) | Total - TRC Costs (NPV) | TRC Benefits (NPV) | TRC Net Benefits (NPV) | TRC Benefit Cost Ratio | SSM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Library Watt- Reader Program | - | - | $ - | $ 3,100 | $ 3,100 | N/A | $ - | $ - | $ 3,100 | $ 3,100 | N/A | $ 155 |
| CFL 15 w Screw in | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Retrofit Non-Profit Housing | | | | | | | | | | | | |
| T8s | - | - | $ - | $ 7,800 | $ 7,800 | N/A | $ - | $ - | $ 7,800 | $ 7,800 | N/A | $ 390 |
| CFLs | - | - | $ - | $ 11,000 | $ 11,000 | N/A | $ - | $ - | $ 11,000 | $ 11,000 | N/A | $ 550 |
| 15 W CFL Socket Replace | - | - | $ - | $ 14,000 | $ 14,000 | N/A | $ - | $ - | $ 14,000 | $ 14,000 | N/A | $ 700 |
| Exit Lights | - | - | $ - | $ 9,200 | $ 9,200 | N/A | $ - | $ - | $ 9,200 | $ 9,200 | N/A | $ 460 |
| Christmas Light Retrofit | - | - | $ - | $ 11,600 | $ 11,600 | N/A | $ - | $ - | $ 11,600 | $ 11,600 | N/A | $ 580 |
| Individual Meters | - | - | $ - | $ 1,700 | $ 1,700 | N/A | $ - | $ - | $ 1,700 | $ 1,700 | N/A | $ 85 |
| | | | | | | | | | | | | |
| Retro Fit Traffic Signal Lights with LED Fixtu | | | | | | | | | | | | |
| LED Fixtures (Note 1) | - | - | $ - | $ 280,782 | $ 280,782 | N/A | $ - | $ - | $ 280,782 | $ 280,782 | N/A | $ 14,039 |
| **Totals** | | | **$ -** | **$ 339,182.31** | **$ 339,182.31** | | | | **$ 339,182** | **$ 339,182** | | **$ 16,959** |

*b) Provide a list of all key assumptions-avoided cost, discount rate etc.*

Many assumptions were taken directly from the TRC tables published by the OEB. The following summary, compiled from information provided by the Enerspectrum Group, references specific lines of these tables. The relevant lines are abstracted and compiled following the summary.

**Library Watt Reader Program**
15W CFL screw in bulbs from OEB Residential table line 16

**Retrofit Non-profit Housing Program**

| | |
|---|---|
| Exit Lights | OEB Commercial table line 10 |
| 15W CFL | OEB Commercial table line 5 |
| 13W CFL | OEB Commercial table line 6 |
| T8's | OEB Commercial table lines 1 and 2 |

**Christmas Light Retrofit**
900 LED Christmas Lights from OEB tables were assumed.
Reference OEB published Residential table line 22.

**Residential 155 Colbourne Replace Bulk with Individual Meters**
Quantity 8 taken from installation records
OEB Residential table line 60

**Every Kilowatt Counts Program (Fall)**
Quantities taken from Fall Every Kilowatt Counts Final Results report
CFL's–A total of Direct Mail + Instore Coupons. Coupon redemption values are multiplied by 2.86 to give total number of bulbs purchased. Mearie Program Report 2006.

Baseboard Programmable Thermostats: Represents 25% of total number of main room baseboard thermostats in home.

Programmable Thermostats: Represents electric heated homes–Space Heating savings assumed for 11% of total installed programmable thermostats, Space Cooling 46% -Mearie Program Report Spring 2006, page 62.

LED's: Results are split 50% between 5 watt and mini light replacement.

| | |
|---|---|
| CFL's | OEB Residential table line 16 |
| Dimmers | OEB Residential table line 23 |
| Motion Sensors | OEB Residential table line 24 |
| Baseboard Prog Thermostats | OEB Residential table line 56 |

| | |
|---|---|
| Programmable Thermostats | OEB Residential table lines 55 & 56 |
| LED's | OEB Residential table lines 22 & 23 |

**Every Kilowatt Counts Program (Spring)**
Quantities taken from Spring Every Kilowatt Counts Final Results report:

Programmable Thermostats–Represents electric heated homes: Space Heating savings assumed for 11% of total installed programmable thermostats, Space Cooling 46% - Mearie Program Report Spring 2006, page 62.

CFL's–A total of Direct Mail + Instore Coupons. Coupon redemption values are multiplied by 2.77 to give total number of bulbs purchased - Mearie Program Report Spring 2006.

| | |
|---|---|
| Ceiling Fans | OEB Residential table line 52 |
| Timers | OEB Residential table line 22 |
| Programmable Thermostats | OEB Residential table line 55 |
| CFL's | OEB Residential table line 16 |

| | Assumptions Used | | | | | |
|---|---|---|---|---|---|---|
| Product | EnerSpectrum TRC | EKC Calculator (Spring) | EKC Calculator (Fall) | Enerspectrum TRC NPV$ | EKC Spring Calculator NPV$ | EKC Fall Calculator NPV$ |
| **EKC Program** | | | | | | |
| CFL | 4 | 4.3 yr life expectancy - coupon redemption values are multiplied by 2.77 to give total number of bulbs purchased | | | $103,305 (EKC) | |
| Ceiling Fans | | 20 years life expectancy | | | $20,658 (EKC) | |
| Timers | | 20 years life expectancy | | | $54,431 (EKC) | |
| Pstats (space heating, space cooling) | 18 | 15 years life expectancy | | | $40,139 (EKC) | |
| Pstats (baseboard) | 18 yr life expectancy | | 18 yr life expectancy. Represents 25% of total number of main room baseboard thermostats in home | | | |
| Dimmers | 10 yr life expectancy | | 10 yr life expectancy | 19.6 (EKC) | | |
| CFL | 4 yr life expectancy | | 4 yr life expectancy. Average number of CFL's purchased per coupon was calculated to be 2.86 units/coupon | 171.1 (EKC) | | |
| LED lights (minis & 5 watt) | 30 yr life expectancy | | 30 yr life expectancy. LED results are split between 5 watt and mini light replacement | 88.9 (EKC) | | |
| Motion Sensors | 20 yr life expectancy | | 20 yr life expectancy | 7.5 (EKC) | | |
| Prog Thermostats (space heating) | 18 yr life expectancy | | 18 yr life expectancy. Represents electric heated homes - central air or boiler - 11% | 685.5 (EKC) | | |
| Prog Thermostats (space cooling) | 18 yr life expectancy | | 18 yr life expectancy. Represents electric heated homes - central air or boiler - 46% | | | |
| **Watt Reader Program** | | | | | | |
| CFL's | 4 yr life expectancy | | | $3.1 | | |
| **Christmas Light Retrofit Program** | | | | | | |
| CFL's | 30 yr life expectancy | | | -$3.2 | | |
| **Retrofit Non-Profit Housing** | | | | | | |
| T-8 Replacement | 5 yr life expectancy | | | $12.7 | | |
| 13w CFL Fixture | 3 yr life expectancy | | | $1.1 | | |
| 15w CFL Socket Replace | 2 yr life expectancy | | | $14.0 | | |
| Exit Lights | 25 yr life expectancy | | | $9.2 | | |

**VECC question 6 (b)**

**Assumptions Taken from OEB Tables**

**Residential Assumptions**

| Number | Efficient Equipment & Technologies | Base Equipment & Technologies | Load Type (Base, Weather Winter, Weather Summer, Load shifting) | Decision Type | Annual Operating Time, hrs/yr | Base Annual Energy Usage (kWh/yr) | Energy Efficient Technology Annual Energy Usage (kWh/yr) | Annual Energy Savings with Upgrade (kWh/yr) | Winter On Peak (kW) | Summer On Peak (kW) | Annual Water Savings Litres/yr | Alternative Fuel Increase m3/yr | EE Technology Life | Incremental Equipment Cost, $ | Lifespan Hours | Free Ridership | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | CFL Screw-In 15W | 60W Incandescent | Lightng | Ret./Repl. | 2,320 | 139 | 35 | 104 | 0.023 | 0.000 | | | 4 | $2.00 | 10,000 | 10% | 15 | 8 | 20 | 0 | 12 | 14 | 17 | 18 |
| 22 | LED Christmas Lights | 5 WATT Christmas lig | Base Winter | Ret./Repl. | 155 | 19 | 1 | 19 | 0.008 | 0.000 | | | 30 | $2.00 | 200,000 | 5% | 6 | 4 | 9 | 0 | 0 | 0 | 0 | 0 |
| 23 | LED Christmas Lights | Incandescent Mini Lig | Base Winter | Ret./Repl. | 155 | 8 | 1 | 7 | 0.003 | 0.000 | | | 30 | $2.00 | 200,000 | 5% | 2 | 1 | 4 | 0 | 0 | 0 | 0 | 0 |
| 22 | Timer - Outdoor Light | 2 Flood Lights, 75W I | Base | New | 4,380 | 876 | 584 | 292 | 0.189 | 0.000 | | | 20 | $20.00 | - | 10% | 43 | 22 | 57 | 0 | 33 | 39 | 49 | 49 |
| 23 | Dimmer Switch | 2 100 Watt incandesc | Base | New | - | 464 | 325 | 139 | 0.090 | 0.000 | | | 10 | $5.00 | - | 10% | 21 | 10 | 27 | 0 | 16 | 19 | 23 | 24 |
| 24 | Motion Detector | 3 100 Watt incandesc | Base | New | - | 696 | 487 | 209 | 0.135 | 0.000 | | | 10 | $25.00 | - | 10% | 31 | 15 | 41 | 0 | 23 | 28 | 35 | 35 |
| 52 | Contractor service (ch | Average existing stoc | Weater/Summ | Ret./Repl. | - | 1,964 | 1,595 | 369 | 0.000 | 0.378 | | | 8 | $420.00 | - | 0% | 0 | 0 | 0 | 66 | 99 | 205 | 0 | 0 |
| 55 | Programmable Therm | Average existing stoc | Weater/Summ | Ret./Repl. | - | 1,964 | 1,805 | 159 | 0.000 | 0.163 | | | 18 | $60.00 | - | 10% | 0 | 0 | 0 | 28 | 43 | 88 | 0 | 0 |
| 56 | Programmable Therm | Average existing stoc | Weather/Wint | Ret./Repl. | - | 18,103 | 16,637 | 1,466 | 1.175 | 0.000 | | | 18 | $60.00 | - | 10% | 202 | 231 | 542 | 0 | 0 | 0 | 219 | 272 |
| 60 | Individul Metering | Average existing stoc | Weather/Wint | Ret/Repl. | - | 6,000 | 5,400 | 600 | 0.240 | 0.205 | | | 20 | $400.00 | - | 0% | 41 | 47 | 111 | 36 | 54 | 111 | 89 | 111 |

**Commercial Assumptions**

| Number | Efficient Equipment & Technologies | Base Equipment & Technologies | Decision Type | Annual Operating Time (hrs/yr) | Base Annual Energy (kWh/yr) | Efficient Energy Use (kWh/yr) | Annual Energy Savings with Upgrade (kWh/yr) | Winter On Peak (kW) | Summer On Peak (kW) | EE Technology Life (yrs) | Incremental Equipment Cost | Lifespan (hrs) | Free Ridership | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 - T8 32W (58 W) re | 4 - T12 34W (156W) | Ret./Repl. | 4000 | 624 | 232 | 392 | 0.088 | 0.084 | 5 | $53 | 20000 | 10% | 45 | 49 | 36 | 42 | 53 | 36 | 95 | 36 |
| 2 | 4 - T8 32W (112W) 4' | 2 - T12 75W (184W) | Ret./Repl. | 4000 | 736 | 448 | 288 | 0.065 | 0.062 | 5 | $65 | 20000 | 10% | 33 | 36 | 27 | 31 | 39 | 27 | 70 | 27 |
| 5 | 15W Screw-In CFL | 60W Incandescent | Ret./Repl. | 4000 | 240 | 68 | 172 | 0.038 | 0.037 | 2 | $4 | 8000 | 10% | 21 | 22 | 17 | 19 | 24 | 17 | 43 | 17 |
| 6 | 13W CFL fixture w/EN | 60W Incandescent | Ret./Repl. | 4000 | 240 | 74 | 166 | 0.041 | 0.039 | 2.5 | $7 | 10000 | 10% | 20 | 22 | 16 | 19 | 24 | 16 | 43 | 16 |
| 10 | 3W LED EXIT sign | 2 - 15W (30W) Incan | Ret./Repl. | 8760 | 263 | 26 | 237 | 0.027 | 0.026 | 25 | $95 | 220000 | 10% | 27 | 29 | 22 | 25 | 32 | 22 | 57 | 22 |

EnerSpectrum Group

Mr. Michael Chase
Corporate Controller
Oshawa PUC Networks Inc.
100 Simcoe Street South
Oshawa, ON
L1H 7M7

September 26, 2007

Re: Application for SSM and LRAM for OPUC CDM Programs

Dear Mr Chase:

As requested in our meeting with you on September 17, 2007, we have reviewed your application for Shared Savings Mechanism (SSM) based on Oshawa PUC Network Inc's CDM program results to the end of 2006, and the costs provided by your LDC.

Based on our review of your data and calculations, and information from similar filings with the OEB, we have adjusted the eligible amounts and arrived at a slightly higher SSM calculation, as noted in the spreadsheet and report submitted to you.

Additionally as requested, we have completed LRAM calculations for some of Oshawa PUC Network Inc.'s CDM programs that we believe qualify for consideration by the OEB. Those calculations are also submitted to you in the report.

Please call me if you have any questions about our review of your SSM and LRAM applications.

Thank you for this opportunity to assist you.

Sincerely,

Bart Burman M.B.A., BA Sc, PEng
Managing Partner

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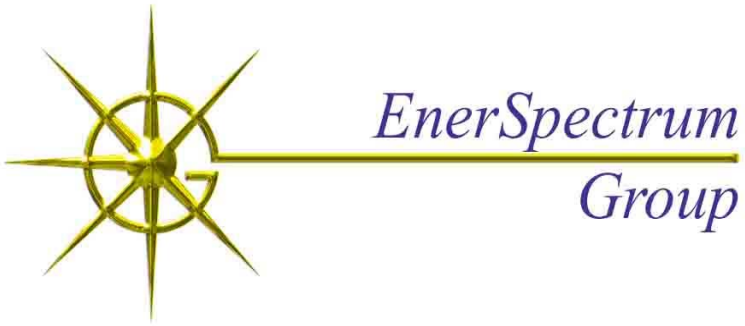


Oshawa PUC Networks Inc.

# LRAM and SSM Assessment

## E1073

Prepared by: Bart Burman, MBA, BA.Sc. P.Eng., Managing Partner

# Introduction

As an incentive to LDCs to participate in Conservation and Demand Management (CDM) programs, the Ontario Energy Board (OEB) introduced rates-based applications to recover revenues lost to customer energy conservation, and to share in gains from effective CDM programs. The mechanisms developed by the OEB to calculate lost revenue or savings are the Lost Revenue Adjustment (LRAM) and the Shared Savings Mechanism (SSM).

The underlying basis for LRAM and SSM applications, is information from CDM program results, or other documented results that qualify. Therefore, it is incumbent on the distributor that sufficient time needs to have passed to ensure measurable results and information have accumulated before LRAM and SSM application is made.

Thus far, three LDCs have formally submitted application for LRAM and SSM to the OEB: Toronto Hydro; Enersource; and Halton Hills Hydro. Thus far, an order has been issued for the Toronto Hydro application allowing some $3.1 million in compensation for LRAM, and $7.2 million under SSM, based on the results reported in the LDC's 2005 and 2006 Annual CDM Reports. However, the OEB has asked Toronto Hydro to resubmit its SSM application without PILS, and to reduce its LRAM amount to reflect free ridership.

Oshawa PUC Networks Inc. has determined that it will file application for LRAM and SSM adjustments based on its 2006 CDM results, reported to the OEB in March, 2007 in its 2006 CDM Annual Report.

# Required

Oshawa PUC Networks Inc. has asked EnerSpectrum Group to assist the LDC with its LRAM and SSM applications on three levels:

1. Review the SSM calculations and underlying data, and assess if the application complies with OEB requirements and make recommendations for improvement as appropriate
2. Assess available lost revenue information associated with Oshawa PUC Networks Inc.'s 2006 CDM results; determine if an LRAM application is feasible based on OEB requirements; and prepare LRAM calculations suitable for submission
3. Provide a letter of verification of SSM and LRAM calculations and assumptions for inclusion Oshawa PUC Networks Inc.'s rates application

# About SSM

Under the SSM regime, a distributor may recover 5% of the net benefits created by the approved CDM portfolio, through a rate rider. An SSM claim requires all of the information as required for LRAM, and it applies only to customer focused initiatives that reduce the demand for electricity and/or reduce the amount of energy used, and only where the costs of the initiatives are expensed. The distributor must calculate the net benefits of a program using the Total Resource Cost (TRC) test that is applied for CDM program annual reporting.

# Methodology

To optimize the calculation of LRAM and SSM amounts, EnerSpectrum Group proposes that it:

1. Review existing LRAM and SSM guidelines and LDC submissions to the OEB, and the OEB order issued to Toronto Hydro, to identify the most prudent course for Oshawa PUC Networks Inc. to complete its LRAM and SSM applications.
2. Seek counsel within the OEB to verify the appropriate assumptions and processes to complete LRAM and SSM submissions
3. Review Oshawa PUC Networks Inc. CDM program results and SSM submission, verify assumptions and calculations, and recommend improvements where appropriate
4. Provide LRAM calculations based on prudent assumptions, CDM results and appropriate rate classes within OEB guidelines
5. Prepare report and recommendations related to LRAM and SSM calculations
6. Prepare a letter of verification by EnerSpectrum Group to be included in the Oshawa PUC Networks Inc. application

# Review of Oshawa PUC Networks Inc. SSM Application

EnerSpectrum Group has reviewed Oshawa PUC Networks Inc.'s SSM application and calculations against the OEB's RP-2004-0203 Report, calculated net TRC benefits (or in the case of program support, costs) for each CDM program. The LDC has confirmed to EnerSpectrum Group that appropriate documentation is on file in support of the costs used in the TRC calculations.

As set out in the TRC Guide, program net benefits are determined by the present value of the benefits (avoided electricity costs minus the present value of program costs over the program's life). On a program basis, gross load reductions are in turn calculated based on TRC guidelines, and then further reduced to recognize free ridership of customers who would have undertaken load and energy consumption reductions regardless of CDM incentives.

The TRC Guide prescribes the calculations as well as the use of such parameters as the unit savings per measure for different measures, free-rider rates, and avoided electricity costs. Moreover, utility-side programs, such as loss reduction initiatives, are not eligible for SSM treatment.

As the spreadsheet in Appendix 1 details, EnerSpectrum Group has reviewed Oshawa PUC Networks Inc.'s TRC calculations for each of its CDM programs and has identified any inconsistencies in the application of program costs, TRC calculations, or assumptions. In some cases, costs or assumptions adjusted, as noted in the spreadsheet comments. Based on these revisions, EnerSpectrum Group arrived at a slightly higher TRC value of $1,242,300 vs $1,229,600 as originally calculated by Oshawa PUC Networks Inc.

The Shared Savings Mechanism allows for 5% of portfolio net TRC values to be retained by the LDC. In this case, that amount computes to $62,115 to be applied for SSM purposes.

## About LRAM

The OEB prescribed in its RP-2004-0203 decision of December 2004, and outlined in the subsequent 2006 EDR Report of the Board, that a distributor is expected to calculate the energy savings by customer class and to value those energy savings using the Board-approved variable distribution charge appropriate to the class. This amount is entered into a deferral account, which may be claimed in a subsequent rate year as compensation for lost revenue.

Lost revenue is calculated using the variable distribution rate (kW or kWh) for each affected class and does not include any Regulatory Asset Recovery rate riders, as these funds have their own independent true-up process in place. In addition, lost revenues are only accruable until new rates (new revenue requirement and load forecast) are set by the Board, as the savings are assumed to be incorporated in the load forecast at that time. LRAM information for an application should include:

- kW or kWh impacts (both gross and net of free riders) of each program and for each class;
- A calculation of the impact of the CDM program on distribution revenues in each class;
- Verification of the participation levels;
- Where savings information is not provided in the TRC Guide, the distributor must comply with the requirements set out in the TRC Guide respecting custom projects;
- Duration of the program in years or months.
- All information filed for the LRAM proposal should correspond to program information used in the calculation of the cost/benefit analysis.

## Oshawa PUC Networks Inc. LRAM Considerations and Calculations

EnerSpectrum Group has reviewed Oshawa PUC Networks Inc.'s CDM program results with respect to completing an LRAM application by class in a manner consistent with the OEB's RP-2004-0188 Report. Input has also been sought directly from OEB personnel.

**Determination of LRAM Amount**

Unlike SSM evaluation, LRAM accounts for variances between actual CDM results and the corresponding energy or load reductions, rather than net present value. For LRAM reductions in customer demand and energy due to CDM programs are applied to the specific rate class and adjusted to reflect free riders, and applied to the appropriate customer class to determine lost revenue.

Consistent with OEB guidelines, and input, EnerSpectrum applied the following steps to assess and calculate eligible LRAM amounts:

1. Obtain kW or kWh savings from 2006 CDM Annual Report
2. Obtain appropriate customer class rate(s)to annual savings
3. Multiply savings by appropriate class rate(s)
4. Reduce amount of lost revenue by applicable free ridership rate to obtain to obtain eligible lost revenue
5. Sum classes of lost revenue to obtain forgone revenues

Calculated LRAM amounts for the reported 2006 CDM program results are shown in the following table:

2005 Residential Load and Revenue Impacts

| Program | Load Impact | | Rate/ kWh | Revenue Impact |
|---|---|---|---|---|
| | kWh | kW | | |
| **Library Watt Reader Program** | 13,154 | 3 | $0.0119 | $157 |
| **Every Kilowatt Counts (Spring)** | 1,674,492 | 107 | $0.0119 | $19,926 |
| **Every Kilowatt Counts (Fall/Winter)** | 2,452,998 | 48 | $0.0119 | $29,191 |
| **Residential 155 Colbourne Replace Bulk with Individual Meters** | 43,200 | 2 | $0.0119 | $514 |
| Total | 4,183,845 | 160 | | $49,788 |

A residential class rate rider would be suggested to recover SSM and LRAM amounts over the next 6 months. However, Oshawa PUC Networks Inc. is advised to first assess the magnitude of the required rider based on the total residential energy delivered in 2006.

Although Oshawa PUC Networks Inc. has focused on its 2006 CDM Annual Report as the basis for its application, EnerSpectrum Group has found some applicable program expenditures and results from 2005 that also qualify.

## Recommendations

After reviewing Oshawa PUC Networks Inc.'s SSM and LRAM calculations and amounts, recommends:

- In support of a submission to the OEB, ensure consistency of TRC calculation by using one calculation tool. Revised TRC values are included in Appendix 1.

- Use OEB data tables for inputs to TRC calculations wherever possible to ensure compliance. Use custom or non-table data only where it can be verified or substantiated beyond a reasonable doubt. Revised TRC values are all based on OEB published tables.

- Maintain a bound paper audit for CDM costs and results as a backup to annual CDM filings, and for inquiries related to specific program details.

- Consider the extension of existing CDM programs or the selection of future CDM programs based on potential SSM and LRAM returns.

- Consider the magnitude and resulting materiality of rate riders required to recover SSM and LRAM amounts.

| | NPV($000) | | OEB Table Used | | Correct Study Period | | Utility Program Costs | | 2006 Report | | Correct WACC | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program | Submitted | Revised | Submitted | Revised | Submitted | Revised | Submitted | Revised | Submitted | Revised | Submitted | Revised | Appendix C Aligned | Comments |
| **Library Watt Reader Program** | 3.1 | 3.1 | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Retrofit Non-profit Housing TOTAL** | 37.0 | 32.1 | | | | | | | | | | | NO | |
| T8 | 12.7 | 7.8 | YES | YES | YES | YES | NO | YES | YES | YES | YES | YES | | Added program costs of $4,967 to TRC Calculator |
| CFL's | 1.1 | 1.1 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | |
| 15W CFL Socket Replace | 14 | 14.0 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | |
| Exit Lights | 9.2 | 9.2 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | |
| **Christmas Light Retrofit OPUC** | -3.2 | 11.6 | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | NO | Qty changed from 36 to 900 |
| **Every Kilowatt Counts (Spring) TOTAL** | 218.3 | 477.9 | | | | | | | | | | | NO | |
| Ceiling Fans | 25.7 | 27.9 | NO | YES | YES | YES | NO | NO | YES | YES | YES | YES | | |
| Timers | 54.4 | 83.4 | NO | YES | YES | YES | NO | NO | YES | YES | YES | YES | | |
| Programmable Thermostats | 40.1 | 54.2 | NO | YES | YES | YES | NO | YES | YES | YES | YES | YES | | Added program costs of $150.00 for EKC. Assumption: Represents electric heated homes - Space Heating 11%; Space Cooling 46%. Mearie Program Report Spring 2006 |
| CFL's | 103.3 | 312.4 | NO | YES | YES | YES | NO | NO | YES | YES | YES | YES | | Assumption: coupon redemption values are multiplied by 2.77 to give total number of bulbs purchased. Mearie Program Report Spring 2006 |
| **Every Kilowatt Counts (Fall/Winter) TOTAL** | 972.7 | 715.9 | | | | | | | | | | | NO | |
| CFL's | 171.1 | 489.3 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | Assumption: coupon redemption values are multiplied by 2.86 to give total number of bulbs purchased. Mearie Program Report Spring 2006 |
| Dimmers | 19.6 | 19.6 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | |
| Motion Sensors | 7.5 | 7.5 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | |
| Baseboard Programmable Thermostats | | 19.7 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | Assumption: Represents 25% of total number of main room baseboard thermostats in home |
| Programmable Thermostats | 685.6 | 121.4 | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | | Added program costs of $150.00 for EKC. Assumption: Represents electric heated homes - Space Heating 11%; Space Cooling 46%. Mearie Program Report Spring 2006 |
| LED's | 88.9 | 58.4 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | | Assumption: Results are split 50% between 5 watt and mini light replacement |
| **Residential 155 Colbourne Replace Bulk with Individual Meters** | 1.7 | 1.7 | YES | YES | YES | YES | NO | NO | YES | YES | YES | YES | YES | |
| **Residential – Establish Baselines and Measuring Impacts** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **AMR/DTM Pilot Program** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Residential System Prototype and Pilot** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Residential Customer Satisfaction Survey** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Residential DSM Indentification – Water Heater Data** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Smart Meter Pilot (Residential-Tantalus Systems)** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Smart Meter – Residential (Operation Group Fee)** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Customer Awareness Education** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | NO | In App C, used Life to date Benefits to adjust Net TRC |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Generation Conservation** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Commercial and Industrial System Protype and Pilot** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | Check Program Costs - not the same as Summary of CDM Expenditures |
| **Independent Market Operator Demand Response Pilot Project** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **System Optimization** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **CDM Web Infrastructure** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| **Total Resource Cost Tool for OEB Reporting** | 0 | 0 | N/A | N/A | YES | YES | YES | YES | YES | YES | YES | YES | YES | |
| | 2462.8 | 2468.2 | | | | | | | | | | | | |


## TOTAL RESOURCE COST TEST CALCULATOR

## 2006 Summer Every KiloWatt Counts Campaign

**Part 1. Enter Data Here (in yellow shaded area: cells C22 and C26:C30)**

| *LDC Information* | |
|---|---|
| **Discount Rate** | 8.13% |

| *Products Sold* | |
|---|---|
| **CFLs** | 5,436 |
| **Ceiling Fans** | 226 |
| **Timers** | 416 |
| **Program Thermostats** | 315 |
| **Program Costs** | $150 |

**Part 2. Results by Technology**

| *Total Resource Cost Test Results by Technology (2007 $'s)* | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Technology* | *TRC Benefits* | *TRC Costs* | *TRC Net Benefits* | *TRC Benefit Cost Ratio* | *Summer Peak kW Savings* | *Net Annual kWh Savings* | *Net Lifecycle kWh Savings* |
| **CFLs** | $114,313 | $11,008 | $103,305 | 10.38 | - | 509,064 | 2,036,256 |
| **Ceiling Fans** | $25,743 | $5,085 | $20,658 | 5.06 | 2.90 | 28,598 | 571,961 |
| **Timers** | $59,111 | $4,680 | $54,431 | 12.63 | - | 68,328 | 1,366,560 |
| **Programmable Thermostats** | $58,567 | $18,428 | $40,139 | 3.18 | 14.18 | 61,805 | 1,112,487 |

**Part 3. Program Results**

| *Total Resource Cost Test Results for Program (2007 $'s)* | |
|---|---|
| **TRC Benefits** | $257,734 |
| **TRC Costs** | $39,350 |
| **TRC Net Benefits** | $218,384 |
| **Benefit Cost Ratio** | 6.55 |
| **Total Summer Peak kW Savings** | 17.08 |
| **Total Annual kWh Savings** | 667,795 |
| **Total Lifecycle kWh Savings** | 5,087,264 |

SeeLine Group Ltd.

**Instructions for Calculating Total Resource Cost Test Results**
**2006 Summer Every KiloWatt Counts Campaign**

**Part 1**
a. Enter Discount Rate (refer to page 5 of the Ontario Energy Board Total Resource Cost Test Guide, Revised October 2, 2006.)

b. Enter number of coupons redeemed by technology.

c. Enter program dollars (refer to page 10 of the Ontario Energy Board Total Resource Cost Test Guide, Revised October 2, 2006.)

**Part 2**
**Total Resource Cost Test Results by Technology**

Where applicable technology savings assumptions were generated using the Ontario Energy Board Measures List data.
A composite technology savings estimate was derived based on various products eligible for coupon redemption and electricity market share.
For a full discussion of the derivation of the estimates, contact the Ontario Power Authority.
Savings and equipment cost are adjusted in the TRC calculation by the free ridership rate.

| | 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) | Summer On Peak (kW) | Free Ridership | EE Technology Life | Incremental Equipment Cost, $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *CFL* | *15.43* | *7.71* | *20.27* | *0.00* | *11.71* | *13.90* | *17.40* | *17.63* | *0* | *10%* | *4* | *$ 2.50* |
| *Ceiling Fan* | *9.66* | *11.04* | *25.91* | *8.38* | *12.57* | *26.05* | *20.95* | *26.05* | *0.014* | *10%* | *20* | *$ 25.00* |
| *Timer* | *27.06* | *13.53* | *35.56* | *0.00* | *20.53* | *24.39* | *30.52* | *30.91* | *0* | *10%* | *20* | *$ 12.50* |
| *Programmable Thermostat* | *23.9* | *25.4* | *59.6* | *14.8* | *9.7* | *30.6* | *24.1* | *30.0* | *0.050* | *10%* | *18* | *$ 65.00* |

*Calculation of TRC Benefits*
= energy/demand savings X avoided cost X participants X (1-free ridership)

*Calculation of TRC Costs*
= equipment cost X participants X (1-free ridership)

*Calculation of TRC Net Benefits*
= TRC Benefits - TRC Costs

**Part 3**
**Program Total Resource Cost Test Results**

*Calculation of Program TRC Benefits*
Sum of TRC Benefits for all technologies

*Calculation of Program TRC Costs*
Sum of TRC Costs for all technologies plus Program Costs

*Calculation of Program TRC Net Benefits*
= TRC Benefits - TRC Costs