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## *Final Report*

# Evaluation of the 2011 Small Business Lighting Initiative

*Funded By:*



*Prepared By:*



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and



September 28, 2012



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**EVALUATION OF THE 2011 SMALL BUSINESS LIGHTING INITIATIVE**



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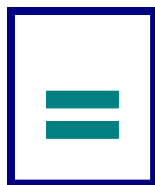
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# EXECUTIVE SUMMARY

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This report, the first of a two-year evaluation cycle, presents the results of the process and impact evaluations of the 2011 program year of Ontario Power Authority's (OPA) Small Business Lighting (SBL) Incentive Initiative.

## EVALUATION GOALS AND OBJECTIVES

### Program Description

Ontario Power Authority's SBL Incentive Initiative provides lighting upgrades to qualifying Ontario small businesses at no charge for equipment valued up to \$1,000. The program is administered and delivered by individual Local Distribution Companies (LDCs) in a variety of ways. LDCs may choose to implement the program through a turnkey implementation contractor, through a stable of qualified lighting installation contractors, through direct service, or through a mixture of contractors and direct service.

The SBL Incentive Initiative represents an evolution of the previous Small Commercial Direct Install Program (SCDI), marketed under the name *Power Savings Blitz* (PSB). The Initiative continues many of the key components of PSB, but includes new elements to test program enhancements that could expand the reach of this direct install program, or at least facilitate implementation and installation contractors to encourage installations beyond lighting, or beyond the \$1,000 cap for direct install.

### Goals and Objectives

In addition to the main goal of estimating gross energy savings, net energy savings, and peak demand reduction for the SBL Incentive Initiative, the evaluation team has the following additional objectives for the 2011 evaluation of the SBL:

- ➔ Determine net-to-gross adjustment factors as appropriate;
- ➔ Create, and/or review and update as appropriate, the prescriptive per-unit input assumptions of all lighting measures included in the Initiative;
- ➔ Through consultation with participants, determine the relative impacts of the delivery strategy used to gain participation and investigate the appropriateness of the current incentive structure;
- ➔ Develop an understanding of the participants' decision-making process



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- ➔ Investigate the instance rates of businesses that have the opportunity to install measures in excess of the \$1,000 threshold, and how many participants are accessing the “Standard Incentives” to fund these opportunities – as well as reasons for why the participant does not fund the additional retrofits.

## IMPACT EVALUATION RESULTS

Participation in the 2011 program totaled 20,235 projects, accounting for 23.76 MW of net summer peak demand savings and 61.18 GWh in net annual energy savings for the program year. Table 1 displays the results of the 2011 impact evaluation for the SBL Incentive Initiative.

A realization rate of 0.895 was determined for energy savings. Demand savings for the program carried a realization rate of 1.076. These energy realization rates were calculated using data collected during site visits from both 2010 and 2011 program years. The final dataset included 143 site visits, 68 from the 2010 evaluation and 75 from the 2011 evaluation.

**Table 1: Impact Results Overview**

Program Metric	Total
Number of Participants	20,235
Program Realization Rate (%)	89.5%
Program Demand Realization Rate (%)	107.6%
Gross Verified Demand Savings (MW)	25.68
Gross Verified Annual Energy Savings (GWh)	65.88
Gross Verified Lifetime Energy Savings (GWh)	386.16
Net to Gross Ratio	0.93
Net Peak Demand Savings (MW)	23.76
Net Annual Energy Savings (GWh)	61.18
Net Lifetime Energy Savings (GWh)	358.56

The verified energy savings results for the program were affected primarily by differences between the assumed operating hours used to calculate reported savings and lower operating hours verified during on-site inspections. The realization rate for demand savings was affected by higher than assumed wattage differences between the baseline and retrofit cases that added to expected demand savings, as well as discrepancies between the measures recorded in the SBL database and what was actually found on site. Actual installations matched the database values for approximately 75% of installed measures. The common discrepancies were fixture counts not matching, particularly for CFL measures, or installed lamp wattages not matching the values



recorded in the database. However, with the realization rate for net summer demand savings exceeding 100%, the percentage of annual demand savings occurring during peak periods was higher on average than assumed by OPA.

Free-Ridership and spillover rates were again low for the program as expected, though higher than previous years. The small business segment does not traditionally embrace conservation programs, which often results in low instances of free-ridership and spillover. For 2011, free-ridership was 7.4% while spillover was 0.3% contributing to an overall Net-to-Gross (NTG) ratio of 0.93 for the program.

## PROCESS EVALUATION RESULTS

For the 2011 program year, process evaluation activities included three tasks: a survey of 2011 SBL participants, stratified by LDC size; a survey of participating installation contractors and assessors; and analysis of the 2011 program database. The evaluation team also launched a survey of Ontario (LDCs), but that survey was not completed in time to be included in this document.

### Participant Findings

Process surveys revealed that SBL participants are very satisfied with their experience with the program and that cost remains a substantial barrier for small commercial customers undertaking any equipment replacement, including lighting. Concerns about equipment cost rated as most important in both lighting and other equipment considerations. Confirming the low level of free-ridership consistently found in this population, only 23% of SBL participants reported that they had considered replacing their lights before learning about the program. We found no differences in participant response patterns by LDC size strata.

We also sought to understand the effect of the expanded access to incentives in the 2011 program year. While all SBL participants reported discussing the scope of their project with their assessor or auditor, only 10% discussed the energy savings resulting from the upgrade, and even fewer discussed how to stay below the incentive maximum. Only 18% of projects went over the incentive cap in 2011, meaning that assessors may be avoiding the conversation completely when conducting SBL assessments. On a more positive note, over one quarter (27%) recalled that their assessor or auditor had identified additional upgrade opportunities, an increase from the 2010 evaluation, but still below the frequency reported by contractors.

Among our participant sample, just under half reported that they had replaced all of their lights. The most common reasons for not replacing the remaining lights are the perceived costs involved, the belief that current lighting is adequate, and the presence of low-use lighting areas.



## Installer and Assessor Findings

While a large majority of participating contractors report wanting to stay involved in the program, survey responses confirm that identifying new SBL participants and projects has become increasingly difficult and that there are areas in which the market appears saturated. Nearly half of contractors also reported that the reimbursement rates were somewhat low and that the profitability of SBL projects had decreased from prior program years. These changes are at least somewhat driven by rising fluorescent prices. Project volume remains an important determinant of the profitability of program work for contractors, meaning that decreasing program activity may magnify the effects of low reimbursement rates.

On a positive note, contractors continued to report job creation resulting from their SBL involvement, and appreciate the availability of Standard Incentives. Contractors indicated that they nearly always mentioned this opportunity to participants, and that an average of 30% of their program jobs used Standard Incentives. Half of contractors also used the SBL program as an opportunity to promote other, non-program measures. Contractors also reported that the \$1000 incentive cap continued to drive project size for many participants: they estimated that lights were not replaced on an average of half of projects because the project had reached the incentive cap.

## Database Analysis Findings

Annual project volumes are decreasing as forecast, with the 20,235 projects completed in 2011 representing less than half of the 48,274 completed in 2010. Delays in program ramp-up during the first five months of 2011 resulted in fewer average monthly completed projects over that period compared to average monthly project volumes after May. However, the low level of projects during these months does not explain all of the difference between actual and expected project volume.

Province-wide, nearly 40% of the qualified General Service accounts (GSA) had completed a project through SBL<sup>1</sup> by the end of 2011. The rate of uptake among qualified accounts varies substantially by LDC. Forty-eight percent of LDCs have installed projects in at least 35% of their qualified accounts.

The availability of Standard Incentives has not resulted in a higher portion of projects going over the cap, nor has it increased the average project size.

Implementation firms continue to play a large role in delivering SBL to qualified accounts. Database records indicate that 61% of all SBL projects were delivered by an implementation firm, and over half (53%) were delivered by Nedco, a large electrical equipment supplier and implementation contractor in Ontario.

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<sup>1</sup> Including the predecessor program, marketed under the Power Savings Blitz label



## CONCLUSIONS AND RECOMMENDATIONS

There remain opportunities to maximize the benefit of the on-site assessments. On-site assessments represent a substantial investment in both time and resources. This service represents an increasingly high leverage opportunity to communicate directly with small commercial customers about controlling their energy costs and becoming more efficient.

In the years since it was first launched as a “blitz” approach, SBL has effectively reached tens of thousands of Ontario business owners with an offer of free lighting equipment. This strategy is straightforward for assessors, who can approach each site with a simple check list completed with a visual inspection. Transitioning a program from plug-and-play measures, like lighting to measures that require more time and expertise on the part of assessors is not a simple prospect. This is particularly challenging when the program administrator has little direct control over the quality or training of the assessors employed to deliver the program in individual service territories.

Even without embracing an expansion of the existing program focus, there are other opportunities to maximize the benefit of the on-site assessments to collect information detailed enough to provide high-confidence estimates of parameters of interest for impact analyses. For example, inconsistencies in estimating and reporting operating hours result in the largest source of variation between reported savings and verified savings values. If it is important for OPA to reduce this variation, revising the form and training assessors to capture more detailed hours of use information (including areas within the same premise with different use profiles) could result in reliable Ontario-specific hours of use estimates for lighting equipment.

### **Recommendations**

What follows is a summary of the major recommendations produced by the Evaluation Team. A more detailed discussion of these and other recommendations can be found in the main report body.

**Conclusion:** Reducing uncertainty in operating hours will address the largest contributor to variation between reported and verified energy savings. OPA collects operating hours information from participants, but the data is often incomplete. If it is important to further reduce the variance between reported and verified savings OPA should:

- ➔ **Recommendation 1:** Work with participants and contractors to capture more consistent operating hours data.
- ➔ **Recommendation 2:** Revise the participant worksheet so that it captures operating hours of different lighting areas where appropriate, not only the business as a whole.

**Conclusion:** While a full review of the PIA assumptions did not occur for the 2011 program year, the Evaluation Team continues to believe that while the values in the Quasi-Prescriptive Measures and Assumptions Document are thoroughly developed, they do not cover all of the



measures included in the SBL program. In addition, the power consumption values listed in the SBL assessment tool generally do not match those values given in the Quasi-Prescriptive document.

- ➔ **Recommendation 3:** Update PIA assumption values as described in Section **Error! Reference source not found.** of the 2010 evaluation. Standardize these values across the Quasi-Prescriptive document and the assessment tool.

**Conclusion:** Contractors, particularly those who also perform assessments, value access to Standard Incentives, report that they promote this option, and claim that nearly one third of participants take advantage of the opportunity to access incentives beyond the scope of SBL. The program database and participant responses indicate that the actual uptake is lower than contractor reports.

- ➔ **Recommendation 4:** Provide customers with more information on the opportunity to access other incentives and estimate out of pocket costs for typical measures.
- ➔ **Recommendation 5:** Consider providing additional sales training and marketing collateral to support assessors' efforts to sell SBL qualified participants on the opportunity to upgrade energy using equipment beyond the cap.

**Conclusion:** The SBL program has effectively reached a substantial portion of qualified Ontario accounts. LDCs, contractors, and participants have all been largely satisfied with the relatively simple processes involved in providing lighting upgrades. Participation levels and contractor responses indicate that additional SBL-qualified projects are becoming harder to find. This, combined with low reimbursement rates could affect contractor profitability to the point that contractors stop promoting SBL. Increasing reimbursement rates, raising the project cap or promoting non-lighting measures are all possible next steps.

- ➔ **Recommendation 6:** Increase the reimbursement rates for SBL trade allies to keep them engaged and to compensate them for the effects of rising prices and more difficult prospecting.
- ➔ **Recommendation 7:** Consider increasing the cap to minimize lost opportunities for these hard-to-reach end users.
- ➔ **Recommendation 8:** Conduct market or comparative research to understand how other program administrators have adapted or expanded program offerings for small businesses.





# 1

## INTRODUCTION

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Ontario Power Authority's (OPA) Small Business Lighting (SBL) Incentive Initiative provides lighting upgrades to qualifying Ontario small businesses at no charge for equipment valued up to \$1,000. The program is administered and delivered by individual LDCs in a variety of ways. LDCs may choose to implement the program through a turnkey implementation contractor, through a stable of qualified lighting installation contractors, through direct service, or through a mixture of contractors and direct service.

The SBL Incentive Initiative represents an evolution of the Small Commercial Direct Install Program (SCDI), previously marketed under the name *Power Savings Blitz* (PSB). The Initiative continues many of the key components of PSB, but includes new elements to test program enhancements that could expand the reach of this direct install program, or at least encourage implementation and installation contractors to encourage installations beyond lighting, or beyond the \$1,000 cap for direct install.

### EVALUATION GOALS AND OBJECTIVES

In addition to the main goal of estimating gross energy savings, net energy savings, and peak demand reduction for the SBL Incentive Initiative, the evaluation team has the following additional objectives for the 2011 evaluation of the SBL:

- ➔ Determine net-to-gross adjustment factors as appropriate;
- ➔ Create, and/or review and update as appropriate, the prescriptive per-unit input assumptions of all lighting measures included in the Initiative;
- ➔ Through consultation with participants, determine the relative impacts of the delivery strategy used to gain Initiative participation and investigate the appropriateness of the current incentive structure;
- ➔ Develop an understanding of the participants' decision-making process
- ➔ Investigate the instance rates of businesses that have the opportunity to install measures in excess of the \$1,000 threshold, and how many participants are accessing the "Retrofit" Initiative to fund these opportunities – as well as reasons for why the participant does not fund the additional retrofits.

### PROGRAM PURPOSE

The SBL program provides turnkey installation of energy efficient lighting and water heating equipment to businesses with demand less than 50 kW at no cost to owners, up to \$1,000. The



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program is designed to overcome the substantial market barriers associated with promoting energy efficient equipment upgrades to small businesses; specifically, lack of access to the capital required to complete efficiency projects.

In 2011, the SBL program provided expanded access to incentive dollars for qualified customers. Rather than being capped at \$1,000 and prohibited from accessing other programs as in prior years, the 2011 SBL allowed participants to tap Standard Incentives (available to other business customers) to help offset the cost of additional qualified energy efficiency upgrades.

The SBL is guided by a Master CDM Program Agreement that outlines customer eligibility, LDC responsibility, and the measures eligible for SBL reimbursement.

To be eligible for SBL customers must:

- ➔ Own or lease the facility where the installation will be carried out;
- ➔ Be a General Service Customer of a participating LDC;
- ➔ Have a monthly peak demand for electricity less than, or forecasted to be less than, 50 kW, and;
- ➔ Not previously participated in SBL, Standard Incentive, or predecessor programs<sup>2</sup>

## PROGRAM GOALS

The projected program participation for 2011-2014 is expected to ratchet down as the portion of qualified accounts already touched by the program increases, however the program slowed down substantially in 2011 (Table 2).

**Table 2: SBL Projected Participation (Projects)**

Year	Expected Project Volume	Actual
2011	40,000	20,325
2012	30,000	--
2013	20,000	--
2014	10,000	--

The 2011 program year got off to a slow start, affected by ambiguity in how to interpret program changes and delays caused by contracting between OPA and the participating LDCs. According to program contacts, a restructuring that eliminated program managers with specific oversight for

<sup>2</sup> Including Small Commercial Direct Install, Power Savings Blitz, Electricity Retrofit Incentive Program, Toronto-Hydro – Business Incentive Program, Building Owners and Managers Association of Toronto, City of Toronto Better Buildings Program, GreenSaver Multi-Family Energy Efficiency Rebate Program, or the Enbridge High Performance New Construction Program.



each initiative aggravated these issues, as did a decision early in 2011 to prohibit staff from producing or providing any program manuals or guidelines to inform LDC implementation. These two factors created uncertainty among LDCs needing clarification on specific program eligibility questions or seeking guidance in programmatic grey areas. LDCs were referred to their contract document for information and advised to have legal staff interpret the language. At least one eligibility change, the allowance of bulk metered buildings, resulted in multiple interpretations, and remained unresolved as of summer 2012.

The 2011 SBL program also allowed LDCs to negotiate assessment fees as appropriate for their own service territory rather than dictating a fixed assessment fee. The opportunity to negotiate variable fees was expected to help rural LDCs compensate assessors for the distance between qualified customers. The administrative funding mechanism was also changed for SBL in 2011. Rather than a formula-driven payment for each completed project and an administrative allotment, each LDC received a set Program Administrative Budget (PAB) to allocate across all initiatives as appropriate for their service territory. The PAB funding was expected to help LDCs allocate their administrative costs to reflect the priorities and opportunities in their specific territory.

Contacts at OPA report that the LDCs are more engaged than they have been before in the CDM programs, in part because they are operating with their own energy savings targets that moved these programs “from a government program where accountability was limited to something that is part of the performance objectives of the LDC executives.”

Finally, one of the more important changes to SBL from prior years is the additional provision allowing participants to access incentives to help offset costs for energy efficiency upgrades that exceed \$1,000. Theoretically, this should motivate assessors and installers to convince small business owners to complete efficiency upgrades beyond the \$1,000 cap and either replace more lighting or upgrade other equipment such as refrigeration or air conditioning. It is not clear that access to additional incentives alone has had an effect on the size or comprehensiveness of energy efficiency projects occurring through SBL so far. However, this change could take a while to become fully integrated as it represents a somewhat different, and perhaps more challenging delivery model than the “blitz” approach that SBL and its predecessors were based on. Rather than assessors going in with a simple checklist, they may need to take more time and have experience beyond lighting retrofits if they are expected to identify and sell more comprehensive energy efficiency upgrades. Fully embracing and implementing this change will likely require full engagement of the key delivery channel for SBL: the implementation contractors.

## PROGRAM RESULTS: WHAT THE DATABASE SHOWS

Findings in this section follow from an analysis of the 2011 project database, and comparison with prior program years’ program results.



Annual project volumes are decreasing as forecast, with the 20,235 projects completed in 2011 representing less than half of the 48,274 completed in 2010. Delays in program ramp-up during the first five months of 2011 resulted in fewer average monthly-completed projects over that period compared to average monthly project volumes after May. However, the low level of projects during these months does not explain all of the difference between actual and expected project volume.

Province-wide, nearly 40% of the qualified General Service accounts (GSA) had completed a project through SBL<sup>3</sup> by the end of 2011. The rate of uptake among qualified accounts varies substantially by LDC (Appendix A). Forty-eight percent of LDCs have installed projects in at least 35% of their qualified accounts.

The availability of Standard Incentives has not resulted in a higher portion of projects going over the cap, nor has it increased the average project size.

## CUSTOMER LOCATION DEMOGRAPHICS

The 2011 project database tracked both participants' business sector and building ownership status (whether or not the participant rented or owned their business space). Nearly half (48%) of projects were performed at service businesses, followed by office, retail and food service (Table 3). Half of the projects were completed in owner-occupied space.

**Table 3: 2011 Total Program Project Volumes by Customer Business Type**

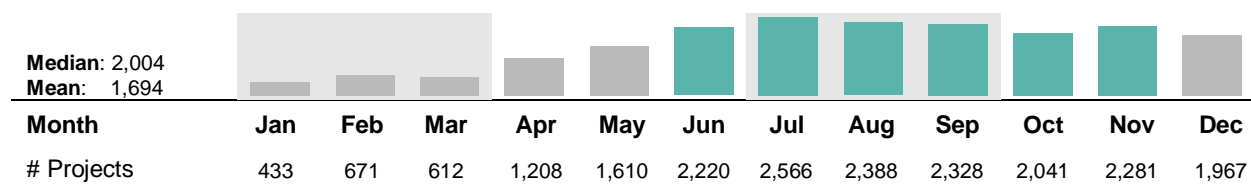
Business Type	# of Projects	Percent of Projects
Service	9,849	48%
Office	3,672	18%
Retail	3,452	17%
Food Service	2,068	10%
Other	1,284	6%

## SEASONAL PROJECT VOLUMES

We analyzed the completion dates of all 2011 projects to understand how project volumes varied during the year. The typical or median monthly project volume for the entire program is 2,004 projects. Months with project volumes equal to, or greater than, the median are represented as “aqua-blue” bars in the chart below (see Table 4). The first quarter of the program had a monthly project volume range between 433 – 612 projects. Project volumes doubled month over month in the first month of the second quarter (April had 1,208 projects). Project volumes increased through July and continued with project volumes greater than the median through November.

<sup>3</sup> Including the predecessor program, marketed under the Power Savings Blitz label



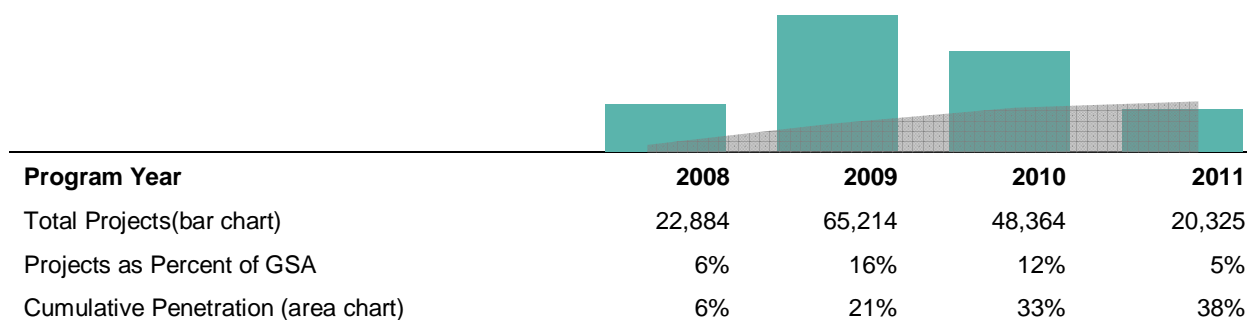
**Table 4: 2011 Total Program Project Volumes by Month**

Sixty-one percent of projects were managed by an implementation firm. Additionally, over half (53%) of all projects were managed by a single implementation firm.<sup>4</sup>

## HISTORIC PROGRAM TRENDS

The Evaluation Team compared annual program project volumes and other characteristics across the past four years (2008-2011). Summary project data were obtained from an analysis of the 2011 project database, and added to similar tables created for prior evaluation reports.

Over the four-year period, the program completed 156,787 projects (Table 5); 41% of these projects (65,214 projects) were completed in the 2009 program year alone. Annual project volumes have been decreasing since 2009. Program year 2010 had 26% fewer projects (48,364) compared to 2009 (65,214); and there were 58% fewer projects (20,325) in 2011 when compared to 2010 (48,364; see Table 5). Additionally, over the past three year period market penetration (the proportion of general service accounts (GSA) that had a project) rose from 6% at the beginning of 2009, and climbed to 38% at the end of 2011.

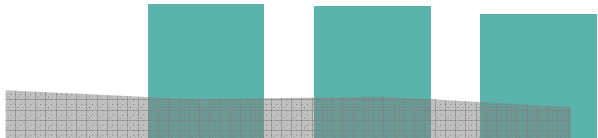
**Table 5: Annual Project Volumes, and Cumulative Projects as a Percent of GSA (Program Penetration)**

The average value of program incentives allocated per project decreased by 8% from a high of \$1,002 in 2009, to a low of \$926 in 2011 (see Table 6). Over that period the proportion of projects with project activity greater than the SBL program incentive cap also decreased from 22% of projects in 2009 to 18% of projects in 2011.

<sup>4</sup> Projects without a "Provider" identified in the project database were classified as LDC managed projects.



**Table 6: Annual Average Project Incentives, and Percent of Projects with Project Activities in Addition to the SBL Incentive Cap**



Program Year	2008	2009	2010	2011
Ave. Project Incentive (bar chart)	NA	\$1,002	\$986	\$926
PCT projects over cap* (area chart)	28%	22%	24%	18%

The Evaluation Team also compared the installer population across the 2010 and 2011 program years. In 2011, the population of participating installation firms decreased to 273, from 437 in 2010. Seventy-four percent of those firms completing program projects in 2011 had also completed projects in 2010 however, just 46% of firms in the 2010 database also appeared in the 2011 database. Inconsistent installation firm names within the program databases mean that these estimates likely overestimate the population of participating installers, and underestimate the amount of installer overlap across the two program years.

## REPORT OVERVIEW

This introductory section is followed by three sections: a discussion of the impact evaluation approach and results, a section presenting the results of the process evaluation, and conclusions and recommendations based on the 2011 evaluation results.



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# 2

## IMPACT EVALUATION

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Impact evaluation activities evaluate the net savings attributable to the SBL program. The Evaluation Team has verified the energy and demand savings by conducting the following impact evaluation activities for the SBL program:

- Sampling of initiative projects
- Performing on-site inspections for selected participant sites
- Comparing the OPA-reported savings to the savings established by site visits to determine “verified gross” savings
- Using attribution surveys to estimate NTG ratio
- Creating stratum and program-level 8760 load shapes

### METHODOLOGY

The overall project impacts are categorized into gross impacts and net impacts. Gross impacts are the energy and demand savings that are found at a customer site as the direct result of a measure implementation. Net impacts are a reflection of the degree to which the gross savings are a result of the program efforts and funds, excluding external factors. The net savings were calculated by applying a NTG ratio to the gross savings. This ratio was calculated through a survey of program participants focused on their rationale for participating in the program. This scaling factor, along with the gross savings, were developed using random sampling methods to select and survey representative projects. To estimate these impacts, the Evaluation Team employed telephone and on-site surveys. A more detailed methodology is presented below.

### Impact Evaluation Sampling Plan

Random sampling of projects for the SBL program began with studying the population distribution and developing a sampling plan based on the following points:

- Overall confidence/precision targets of 90/10 for the SBL program



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- ➔ Stratification of LDCs by the number of eligible customers reported in the 2010 Ontario Energy Board yearbook of Electricity Distributors<sup>5</sup>.
- ➔ An even distribution of samples across strata in order to further develop the dataset for LDCs with fewer eligible customers.

Based on the size of the project population and an assumed coefficient of variation ( $C_v$ ) of 0.5<sup>6</sup>, the Evaluation Team determined that a sample size of 68 samples would be required to obtain a 90% confidence interval with 10% precision. A  $C_v$  of 0.5 is a standard assumption for planning studies when the actual  $C_v$  is not known. In the case of the SBL program the actual  $C_v$  values of the prior two evaluations supported this assumption.

**Table 7: Historic Coefficient of Variation by Year**

Year	Energy Savings $C_v$	Demand Savings $C_v$
2009	0.60	0.51
2010	0.48	0.42

In order to further develop the overall evaluation sample and to investigate differences between groups of LDCs, the 2011 impact evaluation included a total of 75 samples. This allowed the Evaluation Team to stratify the sample to investigate program differences between groups of LDCs, while still meeting the target overall confidence and precision levels for the program.

For the 2011 impact evaluation the sample was stratified based on the number of SBL eligible customers for each LDC listed in the Ontario Energy Board Yearbook of Electricity Producers. This data included 2010 counts of customers with less than 50 kW of demand for each LDC. All 78 LDCs listed in the yearbook were stratified using the Dalenius-Hodges<sup>7</sup> method, which sets strata boundaries based on the number of LDCs that fall within given ranges of eligible customers. Each LDC was stratified into either a Small, Medium, or Large strata, with the Small strata containing those LDCs with the fewest customers. Table 8 shows the breakdown of the quantities of LDCs that fell into each stratum, as well as the number of LDCs in each stratum that reported SBL projects in 2011.

<sup>5</sup> Data was taken from the 2010 update of the published by the Ontario Energy Board Yearbook of Electricity Producers dated August 29<sup>th</sup>, 2011.  
<http://www.ontarioenergyboard.ca/OEB/Industry/Rules+and+Requirements/Reporting+and+Record+Keepin+g+Requirements/Yearbook+of+Distributors>

<sup>6</sup> A statistic used to provide a normalized reading of variability, so as to compare variation in the chosen parameter (realization rate) across different samples. It is defined as the standard deviation of a parameter divided by its mean.

<sup>7</sup> Given a fixed sample size and a fixed number of strata, the Dalenius-Hodges method provides a quick means of determining strata boundaries that approximately minimizes coefficients of variation (CV).





Table 8: LDC Breakdown by Strata

Strata	# of LDCs In Strata	# Reporting Projects For 2011
Small	50	42
Medium	21	19
Large	7	7
<b>Total</b>	<b>78</b>	<b>68</b>

The stratification methods used in previous evaluations have historically weighted the site visits towards the larger LDCs due to the fact that they have more participant projects. For the 2011 evaluation, the visits were distributed equally among the three strata. The rationale for this was to further develop the evaluation dataset for the smaller LDCs. By continuing to develop the dataset across the three strata, it makes it more robust and therefore could be used to research topics of interest for future evaluations. Table 9 summarizes the number of samples that have been collected through site visits over the last three years for each of the 2011 strata. As discussed, the allocation of visits for the 2011 evaluation helps build out the overall sample for the Small and Medium strata while still accurately representing LDCs of all sizes in the overall population.

Table 9: 2011 Strata Site Visit Breakdown by Year<sup>8</sup>

2011 Strata	2009 Visits	2010 Visits	2011 Visits	Total Visits
Small	8	4	25	37
Medium	18	11	25	54
Large	42	53	25	120
<b>Total</b>	<b>68</b>	<b>68</b>	<b>75</b>	<b>211</b>

## Site Visits

In order to gather data and verify savings assumptions the Evaluation Team performed site visits on a random sample of program participant projects. The on-site inspections were intended to evaluate inputs pertinent to the calculation of gross savings and NTG ratios for the program. Before the Evaluation Team contacted any customers, OPA distributed letters to each customer to inform them of the intent of the evaluation and the role of the Evaluation Team. This improved the Evaluation Team's ability to schedule site-visits, while at the same time reassuring customers that their rebates and equipment would not be affected and that all information would be held confidential.

<sup>8</sup> The existing evaluation dataset contains an additional 48 site visits that were performed during the 2010 evaluation that were not assigned 2011 strata during the evaluation.



The methodology for the site inspections incorporated a protocol that follows Option A of the International Performance Measurement and Verification Protocol (IPMVP) for lighting measures. Option A of the IPMVP is titled “Retrofit Isolation: Key Parameter Measurement.” This method uses engineering calculations, along with partial site measurements, to verify the savings resulting from specific measures. Water heating measures were verified for quantity of installation when applicable but no measurement was done on-site. Site inspectors gathered information on baseline and retrofit equipment as well as actual operating conditions. Table 10 outlines the data that was collected for each measure type by on-site engineers. A complete copy of the data collection forms is provided in Appendix D.

**Table 10: On-Site Inspection Information**

Measure	Baseline Information	Retrofit Information
Lighting Measures	Baseline Lamp Type (T8, T12, HO)	Retrofit Lamp Type
	Baseline Ballast Type (Mag. or Elec.)	Confirm Electronic Ballast and Factor
	Lamp Size (4 ft. or 8 ft.)	Lamp Size (4 ft. or 8 ft.)
	# of Lamps per Fixture	# of Lamps per Fixture
	Wattage per Lamp	Wattage per Lamp
	Location of Lamp	Location of Lamp
	Fixture Quantity	Fixture Quantity
	# of Operating Hours for Different Weeks	# of Operating Hours for Different Weeks
Water Heating Measures	Baseline Tank Size	Retrofit Tank Size
	Confirm No Jacket/Pipe Insulation	Jacket/Pipe Insulation and Type
	Confirm Electric Heater	Confirm Electric Heater
	Length of Un-insulated Pipe	Length of Insulated Pipe
	Pipe Diameter	Pipe Diameter
	Baseline Aerator GPM	Retrofit Aerator GPM
	Quantity	Quantity
	Water Heater Fuel	Water Heater Fuel

As is typical in many evaluations, baseline equipment data was not always available at the time of the site visit because the equipment had already been removed. When baseline data was not readily available, on-site engineers do their best to determine the correct baseline equipment through information available on-site. Project participants are surveyed along with looking at equipment inventories to attempt to correctly identify the baseline measure. If baseline information could not be collected through any of these channels, it was assumed that baseline equipment and quantities matched what was defined in the measure description and the tracking database.

The Evaluation Team determined that the measured operating hours variable had the highest uncertainty of any variable in the savings equations. To minimize this uncertainty, up to three HOBO<sup>®</sup> light on/off data loggers were placed in each facility in addition to asking the site contact about operating schedules. The number of loggers placed in each facility was determined



by the visiting engineer according to the number of space types with different operating schedules. The loggers were left in place for at least seven days to determine how measured operating hours and usage differed from reported hours.

### Gross Savings

Gross savings are a determination of savings due to measure installation without consideration for the amount that the SBL program influenced the installation decision. Gross reported savings are the energy savings calculated using the PIA assumptions developed by the OPA. Gross verified savings are the energy savings calculated by the Evaluation Team based on their on-site observations and research. The ratio of gross verified savings to gross reported savings is the project's realization rate.

The Evaluation Team calculated the gross reported savings by using the assumptions found in OPA's 2010 Quasi-Prescriptive Measures and Assumptions document and other planning documents, such as the SBL assessment calculator provided by OPA.<sup>9</sup> A description of each eligible measure and its relevant assumptions as given by OPA are provided in Appendix E.

### Energy Savings

OPA's assumptions for annual energy savings for water heating measures are provided by the savings tool published by the OPA. Annual energy savings for lighting measures can be calculated from the following formula:

$$\text{AnnualEnergySavings} = (BPC - RPC) * AOH \quad \text{Equation 1}$$

where:

<i>BPC</i>	=	Baseline Power Consumption
<i>RPC</i>	=	Retrofit Power Consumption
<i>AOH</i>	=	Annual Operating Hours

Baseline and retrofit power consumption values can be found in Appendix E. The Quasi-Prescriptive Measures and Assumptions document does not list annual operating hour assumptions for the OPA-defined business types. Rather, the document lists assumptions for business types defined in the California Public Utility Commission's DEER database<sup>10</sup>. To map from DEER business types to OPA business types, the 2008 program year evaluation of the

<sup>9</sup> Small Business Lighting Assessment Calculator, Version 11, April, 2011. Provided by the OPA.

<sup>10</sup> California Public Utility Commission and California Energy Commission, Database on Energy Efficient Resources (DEER), 2008 DEER Update - Summary of Measure Energy Analysis Revisions. December 2008. Updated May 13, 2009.



Small Commercial Direct Install Program<sup>11</sup> used the following table, which was adopted by this Evaluation Team for the purposes of calculating gross reported savings for the SBL program. The SBL tracking database does include hours of use data for 56% of the projects but it was not a mandatory field in the project application. The number of projects with hours of use entries also varied by business types and many did not have enough data points to give a high level of confidence in the data. As a result, the evaluation team chose to use the methodology from the previous evaluations and not to use the hours of use data from the SBL tracking database.

**Table 11: Reporting Assumptions for Operating Hours by Business Type<sup>12</sup>**

DEER Business Type	OPA Business Type	Annual Operating Hours	
		CFL	Fluorescent and Metal Halide
Grocery	Convenience Stores	3,879	4,891
Grocery	Grocery	3,879	4,891
Average of Sit-Down and Fast-Food	Food Service	4,825	4,825
Office – Small	Office	3,082	2,594
Retail – Small	Bakery	3,721	3,253
Retail – Small	Retail	3,721	3,253
Retail – Small	Service	3,721	3,253
Average of Sit-Down and Fast-Food	Restaurant	4,825	4,825
Average of all other types except College, University, Manufacturing, and Large Retail	Other	3,174	3,410

### ***Demand Savings***

For the 2011 SBL evaluation, peak demand savings were calculated based on the connected power reduction that was calculated using the SBL database. For each installed measure presented for a project, the assumed OPA kW reduction was applied. The sum of these would be used along with the program peak periods as defined by the OPA Quasi-Prescriptive document to calculate reported peak demand savings. The definition of these hours is provided in Table 12.

<sup>11</sup> The Small Commercial Direct Install Program was the previous name for the Small Business Lighting (SBL) Program.

<sup>12</sup> From 2008 Program Year Evaluation, KEMA, Inc. Pg. C-13. Also included in, Small Commercial Direct Install 2009-2010 Evaluation Report, Nexant, Inc, Pg. 16.



Table 12: OPA Peak Period Definitions

End-Use Load Profile	Winter		Summer		Shoulder	
	Time Period	Hours	Time Period	Hours	Time Period	Hours
Peak	0700-1100 and 1700-2000 weekdays	602	1100-1700 weekdays	522	None	None
Mid-Peak	1100-1700 and 2000-2200 weekdays	688	700-1100 and 1700-2200 weekdays	783	0700-2200 weekdays	1305
Off-Peak	0000-0700 and 2200-2400 weekdays; all hours weekend and holidays	1614	0000-0700 and 2200-2400 weekdays; all hours weekend and holidays	1623	0000-0700 and 2200-2400 weekdays; all hours weekend and holidays	1623

To calculate gross verified demand savings, the Evaluation Team used the methodology outlined in the OPA EM&V Protocols<sup>13</sup>. Table 13 below outlines the definitions of the EM&V peak protocol.

Table 13: EM&amp;V Peak Period Definitions

Definition Source	Months	Days and Hours	How Demand Savings are Calculated
EM&V Protocols: Standard Peak Calculation	Summer: June-August	Weekdays, 1 pm – 7 pm	Average over entire peak period
	Winter: January-December	Weekdays, 6 pm – 8 pm	Average over entire peak period

The EM&V Protocols call for the calculation of both winter and summer peak demand reductions, and thus the Evaluation Team will present numbers for both periods in this report. However, the OPA has judged that summer peak demand savings should be used for reporting and cost effectiveness testing.

### ***Gross Verified Savings and the Realization Rate***

The realization rate reflects the portion of assumed savings that are actually achieved by the customer. For all 2011 projects the Evaluation Team took a random sample and independently calculated the lighting savings for each project based on information gathered during on-site inspections, which included a review of both power consumption and operating hours. This savings value was divided by the gross reported savings, as defined in the Energy Savings

<sup>13</sup> Table taken from the Ontario Power Authority document “EM&V Protocols and Requirements 2011-2014,” March, 2011, Pg. 102.



section, to arrive at a project's realization rate. Realization rates were averaged across the sample to determine the overall lighting realization rate.

Water heating measures were installed in only 4% of all projects in 2011. The Evaluation Team verified installation of these measures while on-site and the measures were given a 100% realization rate dependent on installation. Both the assumed savings and verified savings were combined with the gross lighting savings to calculate a realization rate and gross verified savings value for each project.

The realization rates for each project were rolled up using a weighted average based the percentage of total reported savings into a program wide realization rate. The program realization rate was then applied at the population level to all reported savings. This produced an estimate of the program-level verified savings. Equation 2 shows the basic formula for calculating gross verified savings.

$$Savings_{ver} = Savings_{rep} \times Realization\_Rate \quad \text{Equation 2}$$

where:

$Savings_{ver}$	=	Savings (kWh or kW) verified by the Evaluation Team for the program
$Savings_{rep}$	=	Savings (kWh or kW) reported for the program, as calculated using PIA data
$Realization\ Rate$	=	Average $Savings_{ver}/Savings_{rep}$ for each sample project

As shown above, a realization rate of 1.0 means that the verified savings were equivalent to the savings calculated using OPA's PIA data. A deviation from 1.0 indicates that actual operating conditions, equipment installation, or baseline conditions were different from OPA's assumptions.

### ***Interactive Equipment Energy Changes for Lighting Retrofits***

The OPA's Conservation and Demand Management (CDM) programs incentivize the implementation of equipment with efficiencies above that which a customer might otherwise install. By definition, this equipment should consume less input energy per unit of output energy. However, the energy consumption of equipment in an enclosed space cannot be viewed in isolation. Building systems interact with one another and a change in one system can affect the energy consumption of another. This interaction is important to consider when calculating the benefits provided by CDM programs because it adopts a comprehensive view of societal-level energy changes rather than limiting the analysis to the energy change directly related to the modified equipment. Both the OPA Evaluation Measurement and Verification (EM&V) Protocols and CDM Cost Effectiveness Guide state that interactive energy changes should be quantified and accounted for whenever possible.



See Appendix F for a more detailed review of how interactive energy changes were calculated for lighting retrofits.

### **8760 Load Shape Analysis**

Load shapes are vital in calculating avoided costs for cost effectiveness testing and system on-peak demand savings, especially when the measures installed have daily and seasonal variations in the operating schedule. The Evaluation Team used the operating schedules and metered data gathered during the on-site inspections to construct 8760 hourly load shapes for each sampled project. From this, a weighted average load shape was created for each impact stratum for the purposes of calculating annual avoided costs for cost effectiveness testing. Refer to Appendix G for information about the load shapes generated during the impact analysis.

For water-heating measures where stipulated realization rates were used in the absence of on-site data, the cost effectiveness analysis was conducted based on the OPA assumed load shapes.

### **Lifetime Savings**

The effective useful life (EUL) of retrofit equipment is an important consideration in the assessment of initiative effectiveness because the avoided energy, demand, and cost benefits continue to accrue over the lifetime of the measure.

An EUL was calculated for each impact stratum by weighting the individual project EUL values by the annual net verified energy savings. Individual project EULs were assigned based on the retrofit measure type using values sourced from the Database for Energy Efficient Resources<sup>14</sup>. For most measures, the lifetime energy savings were then calculated as:

$$\text{Lifetime Energy Savings} = \text{EUL} * \text{Annual Energy Savings}$$

Due to anticipated changes in the market for lighting technologies, however, this methodology was adjusted for lighting measures.

### **Adjusted Baseline for Lighting Measures**

Upcoming changes to Canada's energy efficiency regulations will affect the availability of specific lighting technologies in the marketplace<sup>15</sup>. Specifically, they will begin to phase out the use of certain incandescent general service lamps and T12 general service fluorescent technology. In the SBL Program, there were a number of measures that assume a baseline technology that will eventually be phased out. Thus, the measure should not receive the full

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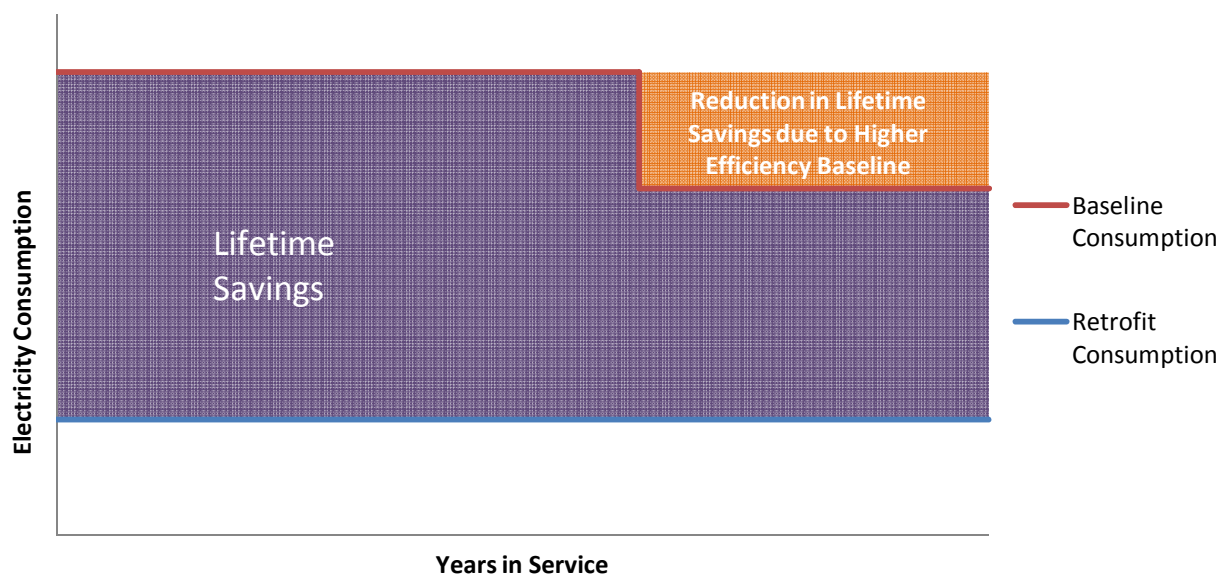
<sup>14</sup> The Database for Energy Efficient Resources (DEER). Database maintained by the California Public Utilities Commission and the California Energy Commission. <http://www.energy.ca.gov/deer/>. Accessed 7/9/2012.

<sup>15</sup> Information on upcoming standard changes was gathered from Natural Resources Canada, <http://oee.nrcan.gc.ca/regulations/16846>



credit for achieving the first year annual energy and demand savings over the lifetime of the measure. In these cases, the Evaluation Team reduced the future savings by increasing the assumed efficiency of the baseline technology at a certain point in the measure life, as illustrated in Figure 1, below.

**Figure 1: Calculation of Lifetime Savings with Future Baseline Adjustments**



The length of time a measure received credit for the full first year annual energy and demand savings values depends on the timing of the market baseline shift (not the timing of the regulation implementation). Refer to Appendix H for more information on the assumptions used to adjust future savings values.

### Net Savings

In order to calculate net savings it is necessary to evaluate the portion of gross verified savings that are specifically attributable to the SBL program. Net savings are determined by multiplying the gross savings by the NTG ratio as shown in Equation 3. This equation and general methodology are the same for estimating demand savings.

$$Savings_{net} = Savings_{ver} \times NTG$$

**Equation 3**

where:

$Savings_{net}$	=	Net savings impact (kWh)
$Savings_{ver}$	=	Gross verified energy savings (kWh)
$NTG$	=	NTG ratio (%)



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NTG ratios are calculated as a function of free-ridership and program spillover. Further description of these factors is given in the following sections.

When chaining the results of two numbers that include sampling error (e.g. the realization rate and the NTG ratio), it is important to account for the propagation of error to the final product (net savings). The relative precision of the net savings value can be calculated as follows:<sup>16</sup>

$$rp_{net\ savings} = \sqrt{rp_{realization}^2 + rp_{NTG}^2} \quad \text{Equation 4}$$

where:

$rp_{net\ savings}$	=	Relative precision of net savings value
$rp_{realization}$	=	Relative precision of the realization rate
$rp_{NTG}$	=	Relative precision of the NTG ratio

### Free-Ridership

The freeridership rate is an estimate of the percent of savings that would have occurred without the program intervention. To calculate freeridership, the Evaluation Team provided a set of questions to the engineer charged with completing the on-site audit. The questions asked participants five core questions with follow-up questions, as appropriate, to obtain a nuanced understanding of participant plans. In addition to questions about plans for equipment replacement and the capital that might have been available to complete this or a similar project, the NTG battery includes a set of questions designed to get a sense for how influential the program was on the respondent's decision to complete the qualified project. Responses were entered into an internet-based database through a tablet computer that each engineer carried on-site.

For the SBL program, the standard approach was modified to account for the fact that participants typically received only free equipment and thus have no logical reason to say the program had no influence on their decision to complete the project in the absence of plans to do so.

Instead of allocating the freeridership value equally for both stated intention (what would the respondent have done in the absence of the program) and program influence (the level of influence the respondent attributes to program features or availability of incentives), the Evaluation Team applied program influence only when a respondent reported having considered or planned to replace lighting equipment before being approached by an assessor. In this way, the program influence score mitigates responses that indicate freeridership, but does not create freeridership in the absence of these responses.

<sup>16</sup> *The California Evaluation Framework*. June 2004. Pg. 303.



This approach means that for SBL participants:

$$FR\ rate = stated\ intention\ score$$

Unless a participant reported that they had considered replacing their lights before. In these cases, the original approach was used:

$$FR\ rate = 0.5 \times (stated\ intention\ score) + 0.5 \times (program\ influence\ score)$$

### Spillover

Spillover is defined as investments in efficiency independent of the program but influenced by program efforts. There are two types of spillover: participant spillover (PSO) and non-participant spillover. Spillover is more difficult to measure with confidence than freeridership because while it is possible to use self-reports or on-site observation to identify likely investments in energy efficiency by participants and non-participants, it is difficult to develop an estimate of the energy savings value of the investment without knowing what was replaced and its condition at time of replacement.

Participant spillover was estimated during the on-site visits with participants. Each participant was asked what, if any, other investments have been made in energy using equipment since participating in the program. If any were reported, the field engineer asked whether the equipment is also energy efficient, and if so, the field engineer asked to see the equipment, obtained the nameplate information, and asked if the participant could also provide any information about the replaced equipment. Questions were asked to gauge the influence of the program in the installation of this equipment.

### NTG Ratio

Once the free-ridership and spillover metrics were determined for the sample, they were combined into a NTG ratio as shown in Equation 5.

$$NTG = 1 - FR + PSO$$

Equation 5

where:

FR = Free rider rate

PSO = Participant spillover

Finally, net savings are determined by multiplying the gross verified savings by the NTG ratio as shown in Equation 3. This equation and general methodology are the same for estimating demand savings.



## RESULTS

The Evaluation Team performed a number of site-visits, as described in the Site Visits section, and used the data collected to calculate the net savings impact from both program years. The results of those efforts are described below.

### Gross Savings

#### *Gross Reported Savings*

The first step in determining net savings was to evaluate the savings reported by OPA. Upon analysis of the project database it was found that an aggregated gross savings value was not reported by OPA. This necessitated the calculation of energy savings for each project using the assumptions and values presented in OPA's PIA. The gross reported savings for both program years are shown in Table 14.

**Table 14: Gross Reported Savings**

Program Metric	Small Business Lighting Incentives
Number of Participants	20,235
Gross Reported Demand Savings (kW)	20,625
Gross Reported Energy Savings (kWh)	70,735,048

#### *Gross Verified Savings*

For the purposes of calculating a program wide realization rate, the Evaluation Team was able to perform site-visits for a total of 75 facilities for the 2011 program year. The most common obstacle in scheduling site-visits was difficulty reaching an appropriate contact person. The Evaluation Team also found a number of wrong or disconnected phone numbers, as well as customers who were too busy to agree to a site-visit. Overall, the Evaluation Team does not expect that these difficulties introduced any significant biases into the sample of projects.

As discussed in the Impact Evaluation Sampling Plan section, the original aim of the evaluation was to calculate realization rates at the strata level. Once the site visits were completed and the realization rates were calculated, it was determined that realization rates could not be calculated with a high enough level of precision at the strata level. The Small, Medium, and Large strata produced precision levels of 18.4%, 12.8%, and 10.0%, respectively, while the province wide number produced a precision level of 7.9%. The Evaluation team determined that applying the province wide realization rate to all LDCs was a more accurate representation of the program results.

In order to increase the overall confidence in the calculated savings numbers, the evaluation team combined the 2011 site visit results with those found during the 2010 evaluation. This added an



additional 68 visits to the overall sample increasing the confidence in the 2011 results. As the program did not undergo any major changes in the installed measure profile or targeted end user between the 2010 and 2011 program years, the Evaluation Team concluded that this was unlikely to introduce any bias into the sample. Due to changes in incentive levels and measure descriptions between 2009 and 2010, the 2009 program year visits were not included in the overall results. The 2011 results were consistent with the results of the 2010 evaluation, which validated the method. Table 15 shows the results for the combined 2010/2011 site visits that were used to calculate gross verified savings for the 2011 evaluation.

**Table 15: Realization Rate Statistics of Project Samples**

Statistics	2010/2011	
	Energy Savings (kWh)	Demand Savings (kW)
<b>Mean Lighting Realization Rate</b>	<b>0.895</b>	<b>1.076</b>
Std Deviation	0.52	0.81
Coefficient of Variation	0.58	0.75
<b>Precision at 90% Confidence Level</b>	<b>±7.9%</b>	<b>±10.3%</b>

The Evaluation Team examined each project to determine the cause of the discrepancy between the calculated savings value and OPA's assumed value. The primary reasons include:

- ➔ **Operating hours:** In many cases the Evaluation Team found that the measured operating hours varied substantially from OPA's assumed values. Operating hours are a major driver of energy savings as well as an important factor in determining average summer demand savings. Further discussion of how reported operating hours were calculated can be found in the Energy Savings section.
- ➔ **Input wattage assumptions:** There was often a disparity between OPA's input wattages and the Evaluation Team's input wattages. In some cases, it was found that the installed equipment differed from the equipment listed in the project database. For example, the database would show 32-watt lamps, but the actual installation would have 28-watt lamps. In other cases, the equipment type would be the same, but ballast factors would cause the input wattage to differ from OPA's PIA.
- ➔ **Missing or extra equipment:** For some projects the Evaluation Team's engineers found that the number of fixtures differed from the number listed in the project database.
- ➔ **Peak Demand – Load Shape Assumptions:** OPA's calculation of peak demand savings relies on an assumed load shape to describe the time period in which savings occur. Based on the operating hours data collected on-site, the Evaluation Team discovered that OPA underestimates the percentage of overall savings that occur during summer peak periods. Differences between the SBL program definition of peak and the EM&V protocol definitions also contribute to this discrepancy. More discussion regarding the differences in these assumptions can be found in the Demand Savings section.



Overall, just under 75% of the sampled projects matched the database entries for every item listed above.

The average program wide realization rate for was then applied to the gross reported program savings to calculate the gross verified savings for the program. The results of these calculations are presented in Table 16.

**Table 16: Gross Verified Savings**

Program Metric	Small Business Lighting Incentive
Gross Verified Demand Savings (MW)	25.68
Gross Verified Annual Energy Savings (MWh)	65,883
Gross Verified Lifetime Energy Savings (MWh)	386,158

### Net Savings

As described in the Lifetime Savings section, net impacts are calculated by multiplying the gross verified savings by a NTG ratio. The development of the NTG ratio is described below.

### Free-Ridership

Delivering the NTG battery requires that the interviewer speak to the decision-maker for each project. For small businesses, this is typically the business owner or manager. For the 2011 program year, the on-site auditors were only able to complete these surveys with 52 of 75 cases. This occurred for a variety of reasons, including lack of access to the decision-maker. Subsequent calls resulted in an additional 19 surveys completed by phone for a total of 71 complete NTG interviews.

Looking across the three strata the Evaluation Team again decided that calculating a program wide free ridership score was the most accurate way to represent the program. One difference of note was that the Large strata reported a free-ridership rate of 9%, while the Small and Medium stratum were 2-3%. The Evaluation Team has noted this difference as a possible research area for future evaluations. The free-ridership rate for the 2011 program year was calculated using a weighted average of the three stratum based on reported savings and was found to be 7.4%.

### Spillover

For a variety of reasons, including lack of decision-maker presence and lack of awareness on the part of the decision-maker, spillover is difficult to measure. On-site engineers asked questions regarding spillover to attempt to understand what additional installed equipment, if any, could be attributed to the program. Calculating spillover requires knowing what was installed and how that compares to the standard level of efficiency for that product in the market.



In 2011 program year activities, for all participants that indicated they had installed other energy efficient equipment, field engineers examined the equipment and recorded all data necessary to calculate energy savings. Out of the 75 site inspections in the random sample, four facilities indicated instances of spillover. These four instances accounted for 5,507 kWh of energy savings and 2.12 kW of peak demand savings.

The ratio of spillover savings to project savings was calculated for each facility. A factor was then applied to these ratios that represented the program's influence in the installation of the spillover measures. The resulting average spillover ratio for 2011 was 3%.

### **NTG Ratios**

Based on the calculated rates of spillover and free-ridership, the Evaluation Team was able to assess the overall NTG ratio. Using the methodology presented in the Spillover is defined as investments in efficiency independent of the program but influenced by program efforts. There are two types of spillover: participant spillover (PSO) and non-participant spillover. Spillover is more difficult to measure with confidence than freeridership because while it is possible to use self-reports or on-site observation to identify likely investments in energy efficiency by participants and non-participants, it is difficult to develop an estimate of the energy savings value of the investment without knowing what was replaced and its condition at time of replacement.

Participant spillover was estimated during the on-site visits with participants. Each participant was asked what, if any, other investments have been made in energy using equipment since participating in the program. If any were reported, the field engineer asked whether the equipment is also energy efficient, and if so, the field engineer asked to see the equipment, obtained the nameplate information, and asked if the participant could also provide any information about the replaced equipment. Questions were asked to gauge the influence of the program in the installation of this equipment.

Table 17 presents the NTG ratios for each sample set.

**Table 17: Net-to-Gross Ratios**

Measure Type	2011	
	Energy	Demand
NTG Ratio	0.93	0.93

NTG ratios were calculated at the strata level and then rolled up to a program wide NTG ratio based on the reported savings for each stratum as a percentage of total savings.



### Net Savings

The Evaluation Team then applied the NTG ratio to the gross verified savings to determine the overall net impacts for the 2011 program year. Table 18 summarizes the Evaluation Team's findings.

**Table 18: Net Savings**

Program Metric	Small Business Lighting Incentive
Net Peak Demand Savings (MW)	23.76
Net Annual Energy Savings (MWh)	61,175
Net Lifetime Energy Savings (MWh)	358,563

## DISCUSSION

The 2011 evaluation presented verified savings totals that were closer to OPA reported savings values than in any of the previous evaluations. Many of the contributing factors to variation between OPA assumptions and gross verified savings still exist in the program.

Hours of use remains the largest contributing factor to variation in gross verified savings. Of the 2011 sample visits the average hours of use was within +/-10% of the OPA assumed value for only 16% of visits. In the majority of cases (82%), the average hours of use of lighting equipment fell below the value assumed by OPA, contributing to the program realization rate of less than 100%. Comparing those rates to connected demand savings where verified savings exceeded OPA assumptions in 57% of visits and only varied from assumed values by +/- 10% in 48% of visits, differences in hours of use are driving much of this variation. One solution that the Evaluation Team may consider for future evaluations is to use previous evaluation data to develop OPA specific hours of use assumptions to be used to calculate reported savings values. This solution would be dependent on the data quality that can be collected in the field as well as future sampling plans.

Another factor driving variation was the number of instances where the SBL database matched the actual project installation. For the 2011 site visits 75% of the samples sites matched the database exactly. The two most common differences were lamp quantities and lamp wattages. In particular, onsite engineers often did not find CFL measures that had been noted as being replaced in the SBL database. CFL measures were installed in just under 35% of the projects for the 2011 program year

Another change to this year's evaluation that will have a major effect on the program going forward was the inclusion of adjusted baselines for measures that are affected by upcoming efficiency code changes as discussed in the Adjusted Baseline for Lighting Measures section. For the 2011 evaluation the adjusted baseline impacted the lifetime savings for 45 of the 76 measures included in the program. These baseline changes would also call for the phase out of six



measures where the new baseline is the same as the original efficiency case for the measure. More details on these changes and assumptions can be found in Appendix H.

## RECOMMENDATIONS

In order to reduce the variance between the estimated and verified energy and demand savings, more detailed information on hours of use will be required. If hours of use were more consistently available, and more accurately accounted for areas with different use profiles, the impact evaluation team could develop Ontario-specific hours of use assumptions that more precisely match the small businesses targeted by SBL.

In the 2011 SBL database approximately 57% of the projects reported operating hours. Ideally, this could be increased to near 100% of applications in order to build confidence around the results. We also recommend revising the application to allow assessors to identify operating hour differences between different areas of the buildings. This would improve the overall accuracy of the reported savings program-wide.





# 3

## PROCESS EVALUATION

For the 2011 program year, process evaluation activities included three tasks:

- 1) A survey of 2011 SBL participants, stratified by LDC size; a survey of participating installation contractors and assessors; and
- 2) An analysis of the 2011 program database.
- 3) A survey of Ontario LDCs, but that survey was not completed in time to be included in this document.

### METHODOLOGY

#### Participant Survey

From the database of 20,325 project records, project participants were stratified by the size of their LDC.<sup>17</sup> Ultimately, 2,040 were randomly selected to provide a sample sufficient to complete 68 interviews in each of the three LDC strata.

**Table 19: Participant Survey Sampling Methods**

Strata (LDC Size)	Population	Sample Frame*	Sample Pulled	Goal Completes
Large	15,345	14,833	680	68
Medium	3,031	2,820	680	68
Small	1,949	1,771	680	68
<b>Total</b>	<b>20,325</b>	<b>19,424</b>	<b>2,040</b>	<b>204</b>

\* Excludes 2011 projects that had not yet been updated in the database at the time the sample was pulled and projects that were included in the impact sample.

Interviews were completed with 204 of these participants in July 2012 by the Ontario research firm Harris/Decima. The number of participant telephone surveys completed was sufficient for a confidence level of 90/10 confidence and precision within each of the three strata.

<sup>17</sup> Ultimately, the 2011 database included 20,235 projects, but not all of these projects were available at the time the participant sample was pulled.



**Table 20: Participant Survey: Final Disposition**

Outcome	Count
Population	20,235
Sample	2040
Not called	760
Bad or wrong number	132
Refusal and break-off	80
Called, not reached	833
Quota filled	31
<b>Completed Surveys</b>	<b>204</b>

Although the probability of selection varied across the three LDC strata, because analyses revealed no significant differences in responses across the strata, we elected not to weight the responses for the process survey. Response frequencies of closed-ended questions are provided in Appendix B.

### Installer/Assessor Survey

The Evaluation Team identified a population of 273 unique contractor firms (assessors and installers) by matching the registration numbers, names, and phone numbers associated with unique firms. Most installation contracting firms listed multiple installers and assessors, and many of them had projects in multiple LDC territories. In order to reach the most appropriate contact within each firm, the list was filtered and identified only the primary installer, assessor, and LDC for each unique firm.

Analysis of this database revealed a wide range in the number of completed projects, ranging from only one project to more than 2,000. In order to ensure that respondents had enough experience with the program to provide meaningful responses to process review questions, firms that had conducted five projects or fewer (the first quartile) were excluded from the sampling frame.

**Table 21: Number of Projects per Firm by Quartile**

Quartile	Number of Projects	Count	Percent
1 <sup>st</sup> Quartile	Less than 6 projects	70	25%
2 <sup>nd</sup> Quartile	6 to 15 projects	68	25%
3 <sup>rd</sup> Quartile	16 to 46 projects	68	25%
4 <sup>th</sup> Quartile	More than 47 projects	68	25%
<b>Total</b>		<b>273</b>	<b>100%</b>



As the sampling frame of 204 assessors and installers required a 34% response rate, the entire sampling frame was used as the call list. Interviews occurred between May 31 and June 13, 2012. Surveys were completed with 70 of these 204 firms, for a confidence and precision of greater than 90/10 for the population.

**Table 22: Installers and Assessors: Final Disposition**

Outcome	Count
Population	273
Sampling frame	204
Sample (Survey Call List)	204
Sampled, not called	39
Called, but not completed	95
Interviewed	70

Because nearly all interviewed firms identified as electrical contractors, we will refer to survey contacts as “contractors” throughout the report. Response frequencies of closed-ended questions are provided in Appendix C.

## RESULTS

### Participant Findings

Relatively few participants (23%) reported that they had considered purchasing lighting equipment before being approached by the program. Respondents were asked about factors behind their decision to participate in the SBL program. The most common response, given by 64% of respondents, was seeking to save money on energy bills (Table 23).

**Table 23: Factors in Decision to Participate (Multiple Responses Allowed; n=199)**

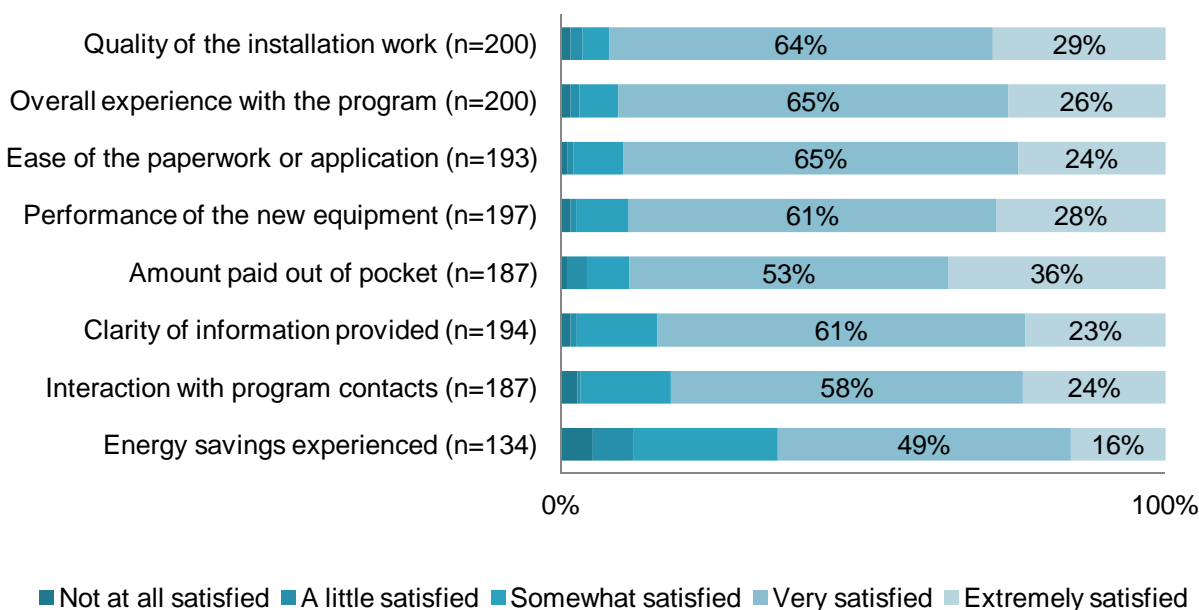
Factor	Percent
Saving money on energy bills	64%
Getting free equipment [up to \$1000]	32%
Conserving energy / protecting the environment	29%
No cost to participate	23%
Seeking improved lighting (quality)	20%
Acquiring the latest equipment	6%
Participation was easy	3%
Replacing broken equipment	2%
Other	5%



### Program Satisfaction

The Evaluation Team asked SBL program participants about their satisfaction with various program elements. Nearly all (91%) of the program participants reported being either “very satisfied” or “extremely satisfied” with their overall experience with the program (Figure 2). Participants provided similar responses for all program elements except the energy savings they experienced, which just over two-thirds (64%) of respondents provided a “very satisfied” or “extremely satisfied” response.

**Figure 2: Satisfaction with Program Elements**



Although not shown here, contacts surveyed onsite reported similarly high levels of satisfaction.

Among those expressing dissatisfaction, five participants expressed concerns over the performance of the equipment, and seven had complaints about their installer (lack of knowledge or skills, not completing the installation, or not seeing the value in their work). A few contacts also mentioned they experienced a delay between assessment and installation—in some cases as long as six months.

### Scope of Project

All participants reported that they had discussed the scope of their project with the assessor or auditor. The majority (83%) of respondents reported discussing the type of lights or fixtures being replaced (Table 24). One-third (32%) reported discussing the number of lights or fixtures being replaced. Less than one-fifth (16%) discussed the quality of the lights and fixtures, and



10% discussed the energy savings resulting from the upgrades or changes. Less than 10% of participants recalled explicitly discussing how to stay below the incentive maximum.

**Table 24: Topics Discussed with Assessor (Multiple Responses Allowed; n=195)**

Topic	Count	Percent
Type of lights/fixtures to be replaced	162	83%
Number of lights/fixtures to be replaced	62	32%
Quality of lights/fixtures	32	16%
Energy savings resulting from the upgrades/changes	20	10%
How to stay below the \$1000 incentive cap	16	8%
Cost	12	6%
Prioritizing projects	10	5%
Hot water tank inclusion/upgrades	4	2%
Other	2	1%

Note: Responses of “Don’t know” and “Refused” were excluded from analysis.

Overall, just under half of contacts (42%) reported replacing all of the lights in their facilities through the program. One-third of contacts (33%) reported exceeding the incentive maximum (Table 25). Although the Evaluation Team had hypothesized that those participants who had considered replacing their lights before being approached by the SBL program would be more likely to use the Standard Incentive to replace the remainder of their lights, the survey results did not find evidence of greater co-investment among these participants. Rather, participants that reported they had considered replacing their equipment before the program were not found to be significantly more likely to invest in the project above the incentive cap. Overall, those participants who had considered purchasing before the program and those who had not exhibited similar program outcomes.

**Table 25: Level of Co-investment and Lights Remaining (n=190)**

Status	Did not exceed the cap	Exceeded the cap
All lights replaced	23%	13%
Not all lights replaced	34%	30%

Note: Responses of “Don’t know” and “Refused” were excluded from analysis.

Of those participants who did not replace all of the lights in their facilities through the program, half (53%) reported that they had replaced 50% or less of their facility’s lighting through the program (Table 26). When asked specifically about linear fluorescents, over half of these



respondents (65 of 119, or 55%) reported not replacing all of their existing fluorescent lighting through the program.

**Table 26: Percentage of Lights Replaced (n=113)**

Reported Percentage of Lights Replaced	Percent
5% to 20%	13%
21% to 40%	19%
41% to 60%	28%
60% to 80%	19%
80% to 98%	19%

Of those contacts who did not replace all their lighting, just one-third (36 of 119, or 30%) indicated that they would be replacing the remaining lights at their business. Among those 67 contacts who did not plan to replace their remaining lights, the most common reasons mentioned included the costs involved (15 of 67, or 22%), the adequacy of current lighting (14 of 67, or 21%), and low usage of lights (11 of 67, or 16%).

Among all contacts, three-fourths (144 of 204, or 71%) reported that they would contact their LDC if they were considering replacing lighting equipment in the future, though. Less than half of the surveyed participants (97 of 204, or 48%) had heard about pending changes in lighting regulations.

In onsite surveys, the evaluation team collected more detail about the types of lights remaining at participant sites. Overall, the evaluation team found T12s remaining in half (53%) of the 51 sites with full on-site surveys. Although interviewers were generally able to identify the T12s, at only half the sites were they able to gain sufficient access to report whether the T12s had electronic or magnetic ballast. When the type of ballast could be identified, most (13 of 16) were found to have magnetic ballast T12s. Furthermore, half of those with T12s said they had additional T12 lamps in storage to replace their existing bulbs.

### ***Dropped Projects***

Less than one-fifth (16%) of program participants mentioned other projects that they had wanted to do but had not completed. Those respondents were asked what projects they were considering and why they did not complete them. The majority of projects that were not completed were additional lighting projects and HVAC system upgrades (13 and 9 mentions, respectively of those 32 contacts with dropped projects).

Among the 32 contacts with dropped projects, most reported that they had not completed their project because it was either too expensive (15 of 32, or 47%) or because rebates were not unavailable (4 of 32, or 13%). One-quarter of respondents were unable to explain why they had dropped their project.



We also asked participants if their assessor had suggested any other upgrades, beyond what could be completed within the \$1,000 incentive amount. Over one-quarter (54 of 204, or 27%) recalled that their assessor or auditor had identified additional upgrade opportunities (7% were unsure). Although a few recalled that non-lighting measures (such as water heater tank wrap or HVAC) had been recommended, additional lighting upgrades accounted for nearly all of these recommendations, according to contacts. Less than one-fourth of those recalling that their assessor had identified additional upgrades (13 of 54) recalled that the auditor or assessor mentioned additional incentives available to offset costs above the program cap, and an additional one-fourth were unsure.

### ***Equipment Use and Decision-Making***

In addition to lighting equipment, participants were asked about other equipment use and the factors that affect equipment purchase decisions. The most common equipment mentioned included heating equipment (88%), one or more refrigerators (78%), cooling equipment (76%), and Computer or office equipment (73%; Table 27).

**Table 27: Equipment and Fixtures Present at Business (Multiple Responses Allowed; n=203)**

Equipment and Fixture	Percent
Heating equipment (e.g., furnace for space heating)	88%
Refrigerator	78%
Cooling equipment (e.g., air conditioner for space cooling)	76%
Computer and office equipment (more than one computer)	73%
Ventilation fans	63%
Electric water heating	52%
Gas water heating	50%
Air compressor	47%
Freezer	29%
Cooking ovens	25%
An energy management system or other controls such as occupancy sensors	17%
Commercial cooking equipment	12%

Forty SBL participants reported that they used specialized, energy-using equipment at their business. For those respondents, HVAC (20%), refrigeration (20%), and hot water tanks (13%) were common responses. A number of participants provided other responses such as business-specific equipment (tanning beds, irons, displays) and production equipment (sewing machines, grain dryers, compressors).

The Evaluation Team also asked participants about the factors that affect their company's lighting purchasing decisions. Over half (57%) reported that the cost of lighting fixtures was an



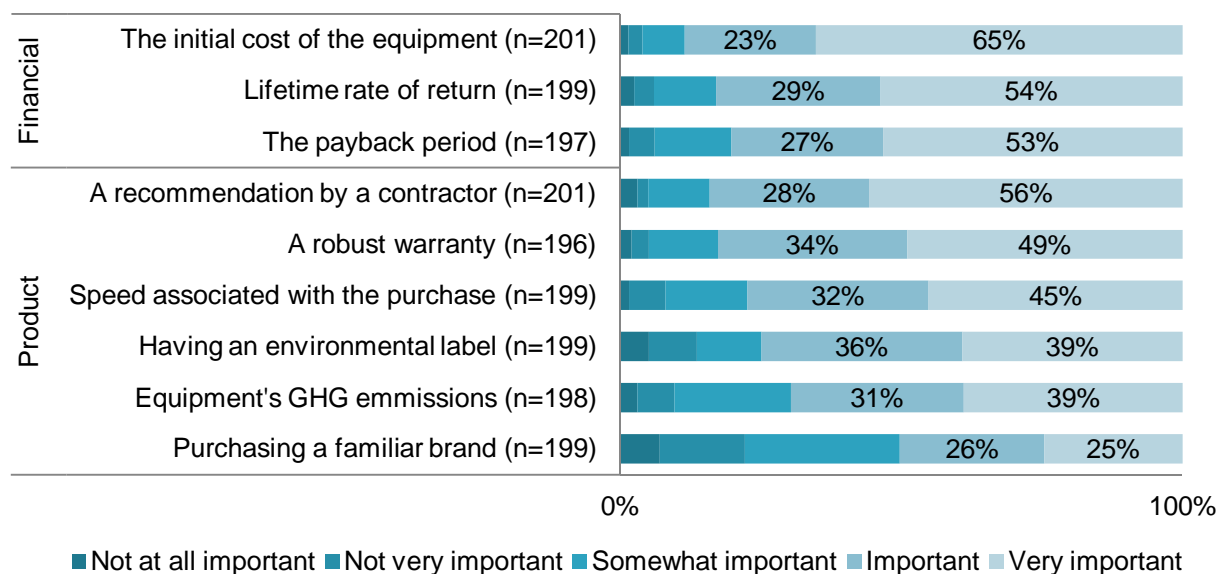
important factor in their purchase decisions (Table 28). Energy efficiency (47%) and lighting quality (44%) were also important factors that affect their company’s lighting purchasing decisions.

**Table 28: Important Factors When Considering Purchasing Lighting (Multiple Responses Allowed; n=194)**

Factor	Percent
Cost of lighting fixtures	57%
Energy efficiency	47%
Light quality	44%
Return on investment	19%
Life expectancy/how long they last	3%
Rebate or financing availability	3%
Durability, low maintenance, and safety	3%
Look/appearance/style	3%
Environmental impact	2%
Other	6%

Participants rated the importance of several financial and product considerations in equipment purchase decisions. The initial cost of the equipment was again the most important consideration in participant purchasing decisions, with 88% of respondents providing a response of “important” or “very important” (Figure 3, next page).

**Figure 3: Importance of Financial and Product Considerations in Purchase Decisions**





### Program Awareness

Participant contacts provided information about their awareness of other energy efficiency programs and how they learned about SBL. Relatively few (22%) recalled learning about other energy efficiency programs prior to SBL. Of these, most recalled learning about programs through the media (15 of 42, or 36%) or from searching the internet (10 of 42, or 24%).

When asked how they preferred to learn about energy efficiency programs, more than one-quarter (27%) of respondents indicated that email was their preferred mode of contact. Having something included in the respondents' utility bill (22%), receiving a brochure (11%), and receiving information through a sales person, distributor, or contractor (10%) were also mentioned. Other responses included communication from a head office, face-to-face contact, fax, local government, and chamber of commerce. Most participants reported learning about SBL through an LDC (55%) or through a lighting contractor, auditor, or assessor (19%; Table 29). Of those who learned through their LDC, roughly a third reported they learned through direct mail, and another third reported they received a phone call.

**Table 29: How Participants Learned about the Small Business Lighting Program (n=204)**

Means of Awareness	Percent
Through my LDC	55%
A lighting contractor, auditor, or assessor	19%
A friend or colleague	15%
Someone came to my door	2%
Online/email	1%
Other	1%
Don't know/Refused	7%

Additionally, we asked respondents how they usually get information regarding lighting technologies for their business. Almost one-third (32%) reported using the internet and less than one-quarter (18%) received information through their LDC (Table 30).

**Table 30: Ways of Getting Information about Lighting Technologies (Multiple Responses Allowed; n=204)**

Means	Percent
Internet	32%
LDC	18%
Lighting contractor	14%
Bill inserts or through the mail	12%
Word of mouth	12%
	Continued...



Means	Percent
Print or TV advertising	7%
Trade journals	6%
In stores or through suppliers	5%
Head office	1%
Other	5%
Don't know/Refused	17%

### Installer and Assessor Findings

In interviews, contractors commented on several aspects of their experience with SBL, including their program involvement and workload, their experience with participant identification, their communication with program staff and implementers, and any other installation opportunities they have noticed or taken advantage of through their program work.

#### *Program Involvement and Workload*

Contacts indicated the volume of work they completed with the program in 2011 and whether they had been involved in prior years.<sup>18</sup> Interviewed firms had completed an average of 176 program projects in 2011, with firms completing anywhere from 6 to over 2000 projects. Half of interviewed firms worked with only one LDC in 2011, and less than a fifth worked with three or more LDCs. Most of the interviewed contractors (61 of 70, or 87%) reported that they had also worked with the program in 2010.

Interviewed contractors also reported on the type of program work they typically do. Although half of contacts (53%) reported that they conduct site assessments, 60% reported that they are primarily installers, and 40% reported performing both assessments and installations equally (Table 31).<sup>19</sup>

<sup>18</sup> Recall that contractors contacted included only firms that had completed six or more projects with the program. The bottom quartile of contractors (those with five or fewer projects) were excluded from the process evaluation survey.

<sup>19</sup> One contact reported only performing assessments and subcontracting out the installation work. This contact has been included in the "assessors and installers" group.



**Table 31: Contractor Program Roles (Multiple Responses Allowed; n=70)**

Role	Percent
Identify participants	69%
Qualify participants	54%
Conduct site assessments	53%
Specify the equipment to be installed	53%
Install equipment	99%
Dispose of removed equipment	99%

Contacts who reported identifying participants were asked how this occurred. Three-fourths of these contacts (77%) reported that they get referrals from existing customers, and half reported either getting a list of participants from an implementer or LDC, or making cold calls to identify participants (Table 32).

**Table 32: Means of Identifying Participants (n=48)**

Means	Selected
Referrals from existing customers	77%
List from implementer	56%
Cold calls	52%
List from LDC	10%
With marketing materials you've developed	6%
Other	8%

With the program project volume in 2011 less than half of that in 2010, the evaluation team sought to understand if program volume met contractors' expectations. Three-fourths of contacts (74%) reported that the volume of program work in 2011 met their expectations. The other one-fourth of contacts reported that program work had been slower than they had expected. Just 16% of contacts reported they have had difficulty keeping up with the workload generated by the program. The reasons for this difficulty varied, but included sporadic program work and the need to prioritize other work over SBL projects, because of the limited profit margins associated with SBL projects. A few others also mentioned delays in assessments.

### ***Participant Identification and Recruitment Experience***

The Evaluation Team also sought contractors' insights and potential explanations for the decrease in project volume. Contacts who reported working with Power Savings Blitz in 2010, and who reported identifying participants, were asked about how identifying participants had changed since 2010. Two-thirds of these contacts (65%) reported that identifying participants had become harder since 2010. Although a few contacts mentioned other reasons, nearly all explained that it had become harder because their territory is becoming saturated. A quarter



(26%) of contacts who also worked with the program in 2010 said the difficulty of participant identification remained unchanged, and two contacts reported it had become easier. The two contacts who reported it had become easier cited increasing awareness among potential customers, and the program rule change allowing for participation of bulk-metered buildings.

We also asked contractors about any difficulties they encountered in initially explaining the program to participants. Half of contractor contacts (47%) reported that participants had no issues, but the other half (51%) reported that participants were initially skeptical of the legitimacy of the offer. Most of these contacts reported that program-branded documentation (including badges, flyers, and other items) or explanation was sufficient to convince participants of the program's legitimacy.

Although small businesses who leased their space had been eligible for program participation in prior years, in 2011 the program expanded eligibility to include select bulk-metered buildings. Contractors reported encountering few challenges while working with leased space and bulk-metered buildings. A large majority of contacts (87%) reported doing projects in leased spaces. Of those, two-thirds (66%) reported having to obtain approval from property owners. Contractors reported that in these cases, the process of obtaining approval mostly occurred in one of three ways: the tenant contacts the owner for permission (39%), the contractor contacts the owner for permission (24%), or the contractor works through the property manager (28%), or some combination of the three (19%). A few contacts mentioned that the implementer or LDC handled getting permission in these cases.

Experience with bulk-metered building projects was slightly lower, with just over half of contacts (53%) reporting that they had done projects in bulk-metered buildings. These contacts reported few problems with determining participant eligibility in these cases: most of these contacts reported determining eligibility by contacting the implementer or LDC. A few reported working with the building owner.

### ***Interaction with LDC and Implementation Contractors***

All interviewed contractors reported that an implementation firm was their primary program contact. Fewer than one third of contacts (21 of 70, or 30%) reported ever having interacted directly with an LDC. Among those that had interacted directly with an LDC, the most common reason for contact was to resolve eligibility questions (12 of 21); a few contractors also mentioned that they contacted LDCs with questions about invoicing or to get program leads. Of those contractors who reported direct LDC contact, 9 of 21 (43%) reported direct contact with LDCs weekly or more often, and the remainder (57%) reported periodic contact with LDCs—monthly or less often.

Overall, few contractors reported uploading participant information into the database themselves. Two-thirds of contacts (70%) reported that implementers upload information into the tracking database for them, and a few (10%) reported that an LDC uploaded the information for them. The remaining fifth (20%) reported that they upload information into the tracking database



themselves. Those contractors who reported uploading information themselves tended to be high-volume contractors, those who performed both assessments and installations, and those working primarily with large LDCs.

The 14 contractors who reported uploading the information themselves also explained how the process worked and how long it took them. All but two reported accessing a portal to upload information. These contacts reported that the process took anywhere between 1 and 30 minutes per project, with an average of 11 minutes.

### ***Additional Equipment Opportunities***

The evaluation team also asked contacts about their perceptions of additional efficiency upgrade opportunities for program participants. Based on contractor responses we estimate that for an average of 50% of their program projects, lights were not replaced because participants had reached the \$1000 cap.

Interviewees also provided feedback on additional opportunities for efficiency upgrades, both specific to and exclusive of lighting. Overall, contacts reported that the program offered a sufficient number of equipment options, with less than a fifth (12 of 70) rating the choices as “limited.” These 12 contacts offered varied explanations for their rating. A few contractors mentioned limitations because of the exclusion of specific products, like LEDs and PAR-20 halogen lamps. Other explanations included a lack of cost-effective options: considering the price schedule, *“there’s a limited amount that’s affordable.”* Finally, several contractors mentioned a lack of flexibility to facilitate specific installation circumstances, specifically: that their ability to update very old lighting was limited by the program options, or that many program retrofit measures specified came as 4-foot packages, and that they would like more ability to use 8-foot packages to simplify specific projects.

### ***Standard Incentives***

Although a majority of interviewed contractors appreciated the 2011 addition of Standard Incentives options to the SBL program, they reported mixed participant uptake. A large majority of contractor contacts (84%)—including 96% of those who perform assessments—were aware that in 2011, SBL participants were eligible for “Standard Incentives” for qualifying equipment installed in excess of the program cap of \$1000. High volume contractors were more likely than contractors with smaller project volumes to be aware of this opportunity (96% of highest volume contractors, versus 70% of lowest volume contractors).

Among contractors who were aware of the opportunity, all but four (or 93%) reported that they always mention this opportunity to customers. Overall the 70 contractor contacts reported that businesses elected to use this incentive an average of 25% of the time, with individual contractors reporting anywhere from none to all of their program jobs electing to access these



incentives.<sup>20</sup> Low-volume contractors actually reported, on average, that slightly more of their jobs elected to use this incentive than other contractors (40% of jobs reported by “small” strata contractors, compared with 27% for both medium and large strata contractors.) Thus, although low-volume contractors were the least likely to be aware of the Standard Incentives opportunity, the ones who were aware had the most success in using the incentive to expand the size of their projects.

Although a third (31%) of contractors aware of the opportunity said that the availability of Standard Incentives had not affected their program work, a majority of contractors (54%) said that it had resulted in more work. In fact, those contractors with the smallest program workload were the most likely to cite this opportunity as beneficial. Quite a few contractors (22% of those aware) volunteered that the opportunity helped make the program more cost-effective for them: *“it means more work and less return trips; most customers make the decision [to do additional work] while we are still onsite. It's been very cost effective.”* On the other hand, a few contractors mentioned that while it did increase their workload, the additional work still had low profit margins. One contractor mentioned that the availability of additional incentives complicated the billing process, because they had to collect money from both the participant and the program.

Contractor contacts also reported on the types of non-lighting efficiency upgrade opportunities they identify on their program jobs. Half of surveyed contractors (51%) reported that, through SBL, they had completed non-lighting efficiency upgrades (Table 33). The most common measures mentioned were program-incented measures: water heater blankets and pipe wrap. Relatively few contractors reported that their work with the program provided them with opportunities to install non-lighting upgrades not covered by the program.

**Table 33: Opportunities for Non-Lighting Upgrades (n=70)**

Contractors Performing Non-Lighting Upgrades	Percent
No	33%
Yes	51%
	Continued...

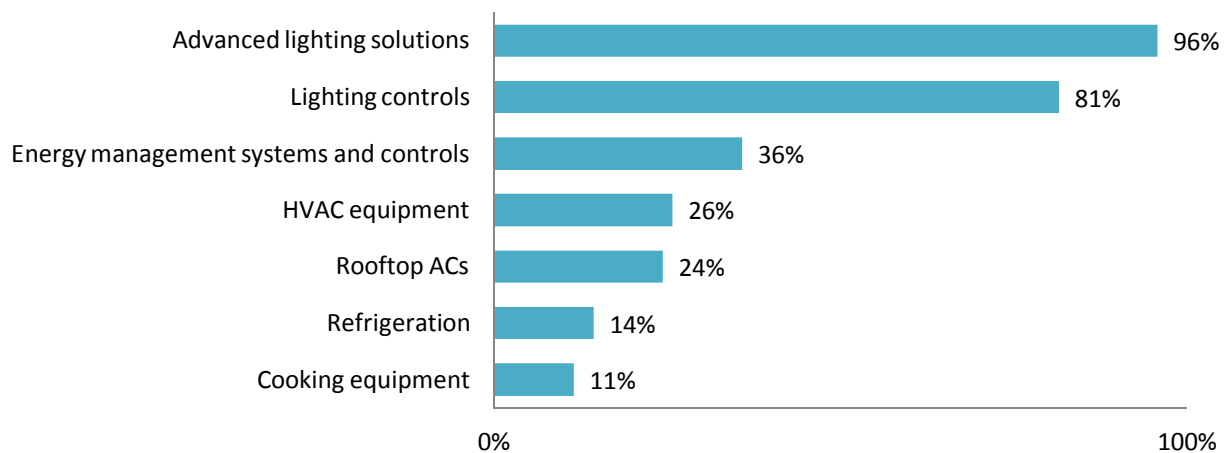
<sup>20</sup> Includes all contractors, including those who were not aware of the opportunity. Those contractors who were aware of the opportunity report that 31% of their jobs use this opportunity.



Contractors Performing Non-Lighting Upgrades		Percent
Upgrade Type	Water heater blankets	30%
	Pipe wrap	13%
	Other lighting; lighting controls and sensors	13%
	Aerators	11%
	HVAC	11%
	Motors	7%
	Refrigeration or case lighting	3%
	Other	3%
Yes, type unspecified		4%
Not Applicable; Installer Only		10%
Don't know		7%

Even though relatively few contacts reported recommending non-lighting upgrades through their SBL work, quite a few interviewed contacts reported that they had experience in recommending or installing other non-lighting equipment types outside the program (Figure 4). Most contacts reported familiarity with “advanced lighting solutions” (defined as “calculations that include daylighting, demand response opportunities, occupancy or photocell controls”) and lighting controls, about a third with energy management systems, and about a quarter with HVAC systems.

**Figure 4: Experience with of Other Equipment (n=70)**



### ***Program Participation Considerations***

We also sought to understand the ways in which SBL-supported work differs from contractors' work outside the program, both in terms of profitability, and also in terms of differences in the types of clients and the equipment and preparation required.

Contractors indicated how program projects compare to their other work, on a number of dimensions (Table 34). Contacts indicated that the equipment they install through the program is of similar efficiency and quality as their other work, but that projects and businesses tend to be smaller.

**Table 34: Differences between Program and Non-Program Work (n=70)**

Program Project Characteristic		Percent
Efficiency	Higher	6%
	Lower	3%
	Same	91%
Quality	Higher	6%
	Lower	1%
	Same	93%
Project size	Larger	7%
	Not larger	93%
Business size	Smaller	94%
	Not smaller	6%

In open-ended responses, half of contacts also indicated other ways in which program-supported projects differed from their other work. Differences tended to be connected with program processes, such as additional paperwork (8 mentions), the assessment and approval process (6 mentions), lower profit margins (5 mentions), and geographic dispersal (5 mentions).

Contractors from firms in the top quartile of completed 2011 jobs (more than 47) commented on how their firm was able to complete so much work through the program. Although several mentioned that good management and organization were important, these contacts overwhelmingly indicated that having dedicated staff to work on program projects was the key to their success.

### ***Compensation Considerations***

Contractor interviewees commented on the profitability of their program work, and the factors that drove profitability. This subject was of particular interest to the evaluation team, given the





reports of increasing fluorescent prices in North America.<sup>21</sup> Overall, contacts were divided over whether SBL work was about the same in profitability as their other work (47%), or less profitable than their other work (50%; Table 35). Just one contact reported that their program work was “somewhat more profitable” than their other work, while five contacts (7%) reported that their program work was “much less profitable” than their other work. These ratings of profitability did not differ significantly across contractor characteristics, including project volume, LDC stratum, or contractor role.

**Table 35: Comparison of SBL Job Profitability with Other Work (n=69)**

Rating	Percent
Somewhat more profitable	1%
About the same	47%
Somewhat less profitable	43%
Much less profitable	7%
Not at all profitable	0%

Those contractors who had also worked with the SBL predecessor program in 2010 were asked to comment specifically on changes in program profitability since the previous year. Overall, roughly half of contacts (32 of 60, or 53%) reported that the profit from their program work had decreased since 2010 (Table 36). Less than a tenth reported that profitability had increased. Interestingly, those contacts who performed both assessments and installations were more likely than those who only performed installations to report a decrease in profitability (69% versus 41%).

**Table 36: Change in Profitability of Program Projects Since 2010 (n=60)**

Change in Profitability	Program Role		Total
	Assessor/Installer (n=26)	Installer only (n=34)	
Decreased	69%	41%	53%
No change	27%	50%	40%
Increased	4%	9%	7%

The most common explanation for the decrease in profitability was an increase in materials prices (mentioned by half of those contacts who reported a profit decrease, or 17 of 32). Other explanations for the decreased profit included: that less work decreased profitability due to increased drive times and administrative time relative to project volume (8 of 32); an increased administrative burden (3 of 32); and more challenging installations (2 of 32). Several of the

<sup>21</sup> Specific price increases vary by product. Limited supplies of oxidized minerals caused several major manufacturers—including GE, Sylvania, and Phillips—to increase average prices by approximately 25% in fall of 2011.



contacts who reported an increase in profitability mentioned that they had gotten better at planning project work; one commented that materials pricing changes had *increased* their profit margins.

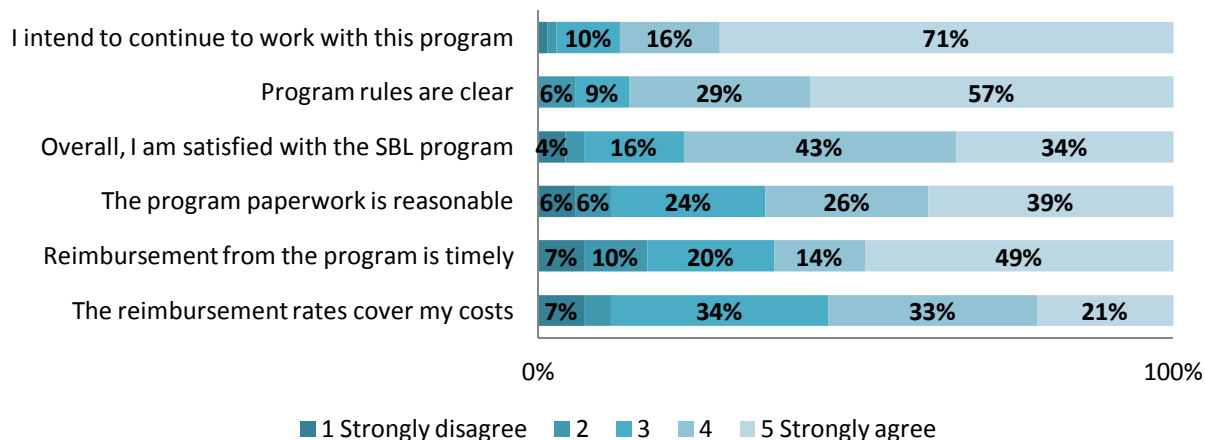
Contacts also reported explicitly on the effect of the rise in fluorescent prices, both on their businesses and on their involvement in the program. Overall, half (50%) of contacts reported no effect, and 40% reported a reduced profit margin. Again, those performing both assessments and installations were affected more by this rise in prices than those performing installations only: just a fourth of installers (24%) reported a decrease in profit margin, compared with nearly two-thirds of installers/assessors (64%).

A majority of contacts (49 of 70) also reported additional costs associated with their participation in the program. These costs included carrying more stock (29 mentions), purchasing ladders or scaffolding (25 mentions), more drive time (“higher roll rates,” 24 mentions), purchasing trucks, trailers (12 mentions), purchasing scissor lifts (8 mentions), rental equipment (8 mentions), and safety equipment or training (5 mentions).

### Program Satisfaction

Contractors indicated their satisfaction with several elements of the SBL program (Figure 5). Overall, a large majority of contractors (87%) agreed (rated a “4” or “5” on a five-point scale) that they would like to continue to work with the program, and three-fourths (77%) agreed that they were “satisfied” with the SBL program. Satisfaction with the clarity of program rules was high, (86% rated a “4” or “5”). Contractors rated the amount and timing of reimbursement for program work the lowest.

Figure 5: Satisfaction with Program Elements (n=70)



Program satisfaction also differed somewhat by contact characteristics. Contractors with the largest program volume, and those who performed both assessments and installations, were the



most satisfied with the program overall. The timeliness of reimbursement, one of the greatest sources of disagreement in Figure 5, was more of a concern for installers only than for those who performed both assessments and installations.

The 22 contractors indicating dissatisfaction with any program element were asked to explain their ratings (Table 37). The most frequent comments, particularly among those who only performed installations, concerned slow payments for work performed. These contacts mentioned that payment typically took two to three months, and as much as six, and that they would prefer payment in 30 days or less. Other topics included paperwork that required multiple trips to the jobsite, or too much back-and-forth with program implementation staff, and more reimbursement needed (especially for high-ceilings and 8-foot T8s). Overall, these comments indicate that while reimbursement rates may be low, they are not yet responsible for widespread program dissatisfaction among program contractors. Rather, program paperwork and perceived delays in payment were somewhat larger sources of contractor concern.

**Table 37: Areas for Improvement (Multiple Responses Allowed; n=22)**

Area for Improvement	Total
Slow payment	11
Cumbersome, redundant paperwork	8
More reimbursement needed	5
Confusing program rules	2
Slowdown in program work	2
Other	4

Contractors also provided more general suggestions for program improvement (Table 38). These suggestions were varied, and generally reiterated topics discussed elsewhere in the interviews. The topics mentioned included the need to increase reimbursement rates (14%), make changes to program measures (14%), streamline program paperwork (11%), and address issues with inaccurate assessments (11%).

**Table 38: Suggestions for Program Improvement (Multiple Responses Allowed; n=70)**

Suggestion for Program Improvement	Percent
None	20%
Increase reimbursement rates	14%
Add or change measures	14%
Streamline paperwork and application process	11%
Assessment issues	11%
Faster payment	9%
	Continued...



Suggestion for Program Improvement	Percent
Increase cap	7%
Change or expand territory, eligible businesses	7%
More work	4%
Decrease lag between assessment and install	3%
Clarify program rules	1%
Other	6%

### **Job Creation**

We also asked our sample of contractors about any job creation effects resulting from their participation in the SBL program. Recall that these contractors exclude contractors in the bottom quartile of program jobs, and are thus not representative of the entire SBL contractor population.

Overall, the program appears to be continuing to support job creation in Ontario. Just under half of contacts (47%) reported adding jobs or avoiding layoffs since January 2011 because of their participation of the program. Specifically, one-fourth of interviewed contractors (26%) reported that they had added a combined total of 41 full-time and 20 part-time staff since January 2011 because of their engagement with the program. Similarly, over a third (39%) reported that they had avoided laying off a combined total of 87 full-time and 12 part-time staff because of the program over the same time period. Unsurprisingly, contractors with a higher volume of program jobs reported greater job creation effects from the program: 92% of high-volume contractor contacts (>46 jobs in 2011) reported job gains through the program, compared with 24% of other sampled contacts (with between 6 and 46 program jobs in 2011).

### **Code Change Effects**

The Evaluation Team also wanted to understand contractors' perceptions of the July 2012 lighting code change that phased out the manufacture of T12 magnetic ballast. Nearly all contractors (89%) were aware of this impending code change at the time of the interview. Two-thirds of these contacts (63%) reported that the impending code change had not affected their lighting retrofits this year. Contacts were uncertain about the future impact of this code change on the market, often expressing conflicting predictions of future effects.

## **DISCUSSION**

Process surveys revealed that SBL participants are very satisfied with their experience with the program and that cost remains a substantial barrier for small commercial customers undertaking any equipment replacement, including lighting. Concerns about equipment cost rated as most important in both lighting and other equipment considerations. Confirming the low level of free-ridership consistently found in this population, only 23% of SBL participants reported that they



had considered replacing their lights before learning about the program. We found no differences in participant response patterns by LDC size strata.

We also sought to understand the effect of the expanded access to incentives in the 2011 program year, and found that there may be additional opportunity to maximize the benefit of having the assessor in small commercial business sites. While all SBL participants reported discussing the scope of their project with their assessor or auditor, only 10% discussed the energy savings resulting from the upgrade, and even fewer discussed how to stay below the incentive maximum. Only 18% of projects went over the incentive cap in 2011, meaning that assessors may be avoiding the conversation completely when conducting SBL assessments. On a more positive note, over one quarter (27%) recalled that their assessor or auditor had identified additional upgrade opportunities, an increase from the 2010 evaluation, but still below the frequency reported by contractors.

Among our participant sample, just under half reported that they had replaced all of their lights. The most common reasons for not replacing the remaining lights are the perceived costs involved, the belief that current lighting is adequate, and the presence of low-use lighting area.

The contractor survey revealed that while a large majority of participating contractors report wanting to stay involved in the program, identifying new SBL participants and projects has become increasingly difficult and there are likely service territories in which the market appears saturated. Nearly half of contractors reported that the reimbursement rates were somewhat low and that the profitability of SBL projects had decreased from prior program years. These changes are at least somewhat driven by rising fluorescent prices. Project volume remains an important determinant of the profitability of program work for contractors, meaning that decreasing program activity may magnify the effects of low reimbursement rates.

On a positive note, contractors continued to report job creation resulting from their SBL involvement, and appreciate the availability of Standard Incentives. Contractors indicated that they nearly always mentioned this opportunity to participants, and that an average of 30% of their program jobs used Standard Incentives. Half of contractors also used the SBL program as an opportunity to promote other, non-program measures. Contractors also reported that the \$1000 incentive cap continued to drive project size for many participants: they estimated that lights were not replaced on an average of half of projects because the project had reached the incentive cap.

## RECOMMENDATIONS

OPA should continue to monitor the 2012 SBL project volume for signs of stabilization or further drop off. Current participation levels and contractor responses indicate that new SBL qualified projects are becoming harder to find. Increasing reimbursement rates, raising the project cap, or promoting other non-lighting measures are all possible next steps. We recommend that OPA increase the reimbursement rates for SBL trade allies to keep them engaged and to compensate them for the effects of rising prices and more difficult prospecting. We also



recommend that OPA consider strategies to encourage promotion and uptake of Standard Incentives.



# 4

## CONCLUSIONS AND RECOMMENDATIONS

### SUMMARY

Annual project volumes are decreasing as forecast; the projects completed in 2011 represent less than half of the 48,274 completed in 2010. Delays in program ramp-up during the first five months of 2011 resulted in fewer average monthly-completed projects over that period compared to average monthly project volumes after May. However, the low level of projects during these months does not explain all of the difference between actual and expected project volume.

Province-wide, nearly 40% of the qualified General Service accounts (GSA) had completed a project through SBL<sup>22</sup> by the end of 2011. The rate of uptake among qualified accounts varies substantially by LDC (Appendix A). Forty-eight percent of LDCs have installed projects in at least 35% of their qualified accounts.

### Impact Findings

The 20,235 projects completed through the 2011 SBL program represent 23.76 MW of net summer peak demand savings and 61.18 GWh in net annual energy savings for the program year. Table 39 displays the results of the 2011 impact evaluation for the SBL Initiative.

A realization rate of 0.895 was determined for energy savings. Demand savings for the program carried a realization rate of 1.076. These energy realization rates were calculated using data collected during site visits from both 2010 and 2011 program years. The final dataset included 143 site visits, 68 from the 2010 evaluation and 75 from the 2011 evaluation.

**Table 39: Impact Results Overview**

Program Metric	Total
Number of Participants	20,235
Program Realization Rate (%)	89.5%
Program Demand Realization Rate (%)	107.6%
Gross Verified Demand Savings (MW)	25.68
Gross Verified Annual Energy Savings (GWh)	65.88
Gross Verified Lifetime Energy Savings (GWh)	386.16
Net to Gross Ratio	0.93
	Continued...

<sup>22</sup> Including the predecessor program, marketed under the Power Savings Blitz label



Program Metric	Total
Net Peak Demand Savings (MW)	23.76
Net Annual Energy Savings (GWh)	61.18
Net Lifetime Energy Savings (GWh)	358.56

The verified energy savings results for the program were affected primarily by differences between the assumed operating hours used to calculate reported savings and lower operating hours verified during on-site inspections. The realization rate for demand savings was affected by higher than assumed wattage differences between the baseline and retrofit cases that added to expected demand savings as well as discrepancies between the measures recorded in the SBL database and what was actually found on-site. Actual installations matched the database values for approximately 75% of installed measures. Common discrepancies were fixture counts not matching, particularly for CFL measures, or installed lamp wattages not matching the values recorded in the database. However, with the realization rate for net summer demand savings exceeding 100%, the percentage of annual demand savings occurring during peak periods was higher on average than assumed by OPA.

Free-Ridership and spillover rates were again low for the program as expected, though higher than previous years. The small business segment does not traditionally embrace conservation programs, which often results in low instances of free-ridership and spillover. For 2011, free-ridership was 7.4% while spillover was 0.3% contributing to an overall Net-to-Gross ratio of 0.93 for the program.

### Process Findings

Process surveys continue to find that SBL participants are quite satisfied with their experience and that most contractors want to continue their involvement with the program. Only 18% of projects went over the incentive cap in 2011, meaning that assessors may be avoiding the conversation completely when conducting SBL assessments. Among our participant sample, just under half reported that they had replaced all of their lights. This finding was confirmed through surveys with contractors, who report that the \$1,000 incentive cap continued to drive project size for many participants and estimated that lights were not replaced on an average of half of projects because the project had reached the incentive cap.

The 2011 impact evaluation presented verified savings totals that were closer to OPA reported savings values than in any of the previous evaluations. Many of the contributing factors to variation between OPA assumptions and gross verified savings will likely be present in the 2012 evaluation, particularly issues associated with missing or inaccurate hours of use assumptions. Of the 2011 sample visits the average hours of use was within +/-10% of the OPA assumed value for only 16% of visits. In the majority of cases (82%) the average hours of use of lighting equipment fell below the value assumed by OPA, contributing to the program realization rate of less than 100%.





## CONCLUSIONS AND RECOMMENDATIONS

There remain opportunities to further maximize the benefit of the on-site assessment. On-site assessments represent a substantial investment in time and resources. This service increasingly represents a potentially high leverage opportunity to communicate directly with small commercial customers about controlling their energy costs and becoming more efficient.

In the years since it was first launched as a “blitz” approach, SBL has effectively reached tens of thousands of Ontario business owners with an offer of free lighting equipment. This strategy is straightforward for assessors, who can approach each site with a simple check list completed with a visual inspection. Transitioning a program from plug-and-play measures like lighting to measures that require more time and expertise on the part of assessors is not a simple prospect, particularly when the program administrator has little direct control of the quality or training of the assessors employed to deliver the program in individual service territories.

OPA may need to establish a strategy for managing a larger province-wide trade ally network that expands what has been a near exclusive focus on lighting. Working directly with the implementation firms involved in delivering SBL could provide insight into the extent to which the existing stable of assessors and implementers is able to recommend and deliver HVAC, refrigeration, shell, and other efficiency measures in small businesses. As a first step toward this, assessors could be trained and paid to capture more premise-level characteristics and record other potential opportunities for subsequent outreach to promote specific equipment upgrades and link to demand response programs, should those opportunities become available.

Even without embracing an expansion of the existing program focus, there are other opportunities to maximize the benefit of the on-site assessment to collect information detailed enough to provide high-confidence estimates of parameters of interest for impact analyses. For example, inconsistencies in estimating and reporting operating hours result in the largest source of impact variation. If it is important for OPA to reduce this variation, revising the form and training assessors to capture more detailed hours of use information (including areas within the same premise with different use profiles) could result in reliable Ontario-specific hours of use estimates for lighting equipment.

### Recommendations

**Conclusion:** Reducing uncertainty in operating hours will address the largest contributor to variation between reported and verified energy savings. OPA collects operating hours information from participants but the data is often incomplete. If it is important to further reduce the variance between reported and verified savings, OPA should:

- ➔ **Recommendation 1:** Work with participants and contractors to capture more consistent operating hours data.
- ➔ **Recommendation 2:** Revise the participant worksheet so that it captures operating hours of different lighting areas where appropriate, not only the business as a whole.



**Conclusion:** While a full review of the PIA assumptions did not occur for the 2011 program year, the Evaluation Team continues to believe that while the values in the Quasi-Prescriptive Measures and Assumptions Document are thoroughly developed, they do not cover all of the measures included in the SBL program. Also, the power consumption values listed in the SBL assessment tool generally do not match those values given in the Quasi-Prescriptive document.

- ➔ **Recommendation 3:** Update PIA assumption values as described in Section 5 of the 2010 evaluation. Standardize these values across the Quasi-Prescriptive document and the assessment tool.

**Conclusion:** Contractors, particularly those who also perform assessments, value access to Standard Incentives, report that they promote this option, and claim that nearly one third of participants take advantage of the opportunity to access incentives beyond the scope of SBL. The program database and participant responses indicate that the actual uptake is lower than contractor reports.

- ➔ **Recommendation 4:** Provide customers with more information on the opportunity to access other incentives and estimate out of pocket costs for typical measures.
- ➔ **Recommendation 5:** Consider providing additional sales training and marketing collateral to support assessors' efforts to sell SBL qualified participants on the opportunity to upgrade energy using equipment beyond the cap.

**Conclusion:** The SBL program has effectively reached a substantial portion of qualified Ontario accounts. LDCs, contractors, and participants have all been largely satisfied with the relatively simple processes involved in providing lighting upgrades. Participation levels and contractor responses indicate that additional SBL-qualified projects are becoming harder to find. This, combined with low reimbursement rates could affect contractor profitability to the point that contractors stop promoting SBL. Increasing reimbursement rates, raising the project cap or promoting non-lighting measures are all possible next steps.

- ➔ **Recommendation 6:** Increase the reimbursement rates for SBL trade allies to keep them engaged and to compensate them for the effects of rising prices and more difficult prospecting.
- ➔ **Recommendation 7:** Consider increasing the cap to minimize lost opportunities for these hard-to-reach end users.
- ➔ **Recommendation 8:** Conduct market or comparative research to understand how other program administrators have adapted or expanded program offerings for small businesses.





# APPENDICES

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- APPENDIX A: HISTORIC PROJECT SUMMARY BY LDC**
- APPENDIX B: PARTICIPANT RESPONSE FREQUENCIES**
- APPENDIX C: INSTALLER & ASSESSOR RESPONSE FREQUENCIES**
- APPENDIX D: SITE INSPECTION DATA COLLECTION FORMS**
- APPENDIX E: MEASURE SAVINGS ASSUMPTIONS**
- APPENDIX F: INTERACTIVE ENERGY CHANGES FOR LIGHTING RETROFITS**
- APPENDIX G: DEVELOPMENT OF LOAD PROFILES**
- APPENDIX H: LIFETIME SAVINGS: ADJUSTED FUTURE BASELINES**
- APPENDIX I: RESULTS MAPPING TO LDC**
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- APPENDIX K: LDC STRATIFICATION LIST**
- APPENDIX L: SURVEY INSTRUMENTS**



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# HISTORIC PROJECT SUMMARY BY LDC

**Table 40: LDC Saturation Level**

LDC	GSA <50kW	Project Count by Program Year					Cumulative % With Project
		'08	'09	'10	'11	Total	
Algoma Power			-		9	9	-
Atikokan Hydro Inc.			-	16	19	37	-
Bluewater Power Distribution Corporation	4,172		415	394	87	896	21%
Brant County Power Inc.	1,288	80	305	129	3	517	40%
Brantford Power Inc.	3,196	186	1030	98	102	1,416	44%
Burlington Hydro Inc.	4,863	309	1420	495	82	2,306	47%
Cambridge and North Dumfries Hydro Inc.	4,668	227	913	479	118	1,737	37%
Canadian Niagara Power Inc.	1,290	130	435	193	14	772	60%
Centre Wellington Hydro Ltd.	687	12	73	62	34	181	26%
Chapleau PUC			-		21	21	-
Chatham-Kent Hydro Inc.	3,155	307	812	281	43	1,443	46%
COLLUS Power Corp.	1,566		408	226	37	671	43%
E.L.K. Energy Inc.	1,099	95	812	66	56	530	48%
Enersource Hydro Mississauga Inc.	16,693		64	305	3,407	6,956	42%
EnWin Utilities Ltd.	7,040	892	408	508	508	3,843	55%
Erie Thames Powerlines Corporation	1,406	90		812	59	467	33%
Essex Powerlines Corporation	1,993	220	64	125	40	970	49%
Festival Hydro Inc.	1,988	106	377	276	117	876	44%
Goderich Hydro		3	101	43	17	164	-
Greater Sudbury Hydro Inc.	4,097	166	214	127	87	594	14%
Grimsby Power Incorporated	739		75	40	25	140	19%
Guelph Hydro Electric Systems Inc.	3,712	210	793	398	198	1,599	43%
Haldimand County Hydro Inc.	2,433	134	413	98	44	689	28%
Halton Hills Hydro Inc.	1,741	57	542	163	38	800	46%
Hearst Power Distribution Company Ltd.					32	32	-

Continued...



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LDC	GSA <50kW	Project Count by Program Year					Cumulative % With Project
		'08	'09	'10	'11	Total	
Horizon Utilities Corporation	19,906	1,335	3,218	2,030	693	7,276	37%
Hydro Hawkesbury Inc.					25	25	-
Hydro One Networks Inc.	109,722	1,318	4,826	12,994	4,291	23,429	21%
Hydro Ottawa Limited	23,314	300	1,858	2,686	1,025	5,869	25%
Innisfil Hydro Distribution Systems Limited	925	30	155	98	11	294	32%
Kenora Hydro Electric Corporation Ltd.	724		18	6	2	26	4%
Kingston Hydro Corporation	3,429		256	315	103	674	20%
Kitchener-Wilmot Hydro Inc.	7,337	353	1,148	670	239	2,410	33%
Lakefront Utilities Inc.	1,138	61	124	60	101	346	30%
Lakeland Power Distribution Ltd.	1,590		113	106	51	270	17%
London Hydro Inc.	11,940	8	1,222	3,044	40	4,314	36%
Middlesex Power Distribution Corporation	687		137	124	8	269	39%
Midland Power Utility Corporation	727	18	96	106	83	303	42%
Milton Hydro Distribution Inc.	2,312	92	759	188	8	1,047	45%
Newmarket - Tay Power Distribution Ltd.	2,996	201	274	299	165	939	31%
Niagara Peninsula Energy Inc.	4,355		369	434	320	1,123	26%
Niagara-on-the-Lake Hydro Inc.	1,247		135	64	164	363	29%
Norfolk Power Distribution Inc.	2,097	106	450	122	91	769	37%
North Bay Hydro Distribution Limited	2,637	110	294	39	203	646	24%
Northern Ontario Wires Inc.				114	36	150	-
Oakville Hydro Electricity Distribution Inc.	5,533	241	1,519	765	183	2,708	49%
Orangeville Hydro Limited	1,019	39	116	122	23	300	29%
Orillia Power Distribution Corporation	1,386	163	249	137	103	652	47%
Ottawa River Power Corporation	1,429			80	109	189	13%
Parry Sound Power Corporation	565	18	165	44	23	250	44%
Peterborough Distribution Incorporated	1,001	123	419	302	41	885	88%
PowerStream Inc.	25,340	516	7,651	2,519	1,943	2,629	50%

Continued...



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LDC	GSA <50kW	Project Count by Program Year					Cumulative % With Project
		'08	'09	'10	'11	Total	
PUC Distribution Inc.	3,381			185	182	367	11%
Renfrew Hydro Inc.	523			64	12	76	15%
Rideau St. Lawrence Distribution Inc.	827		109	59	77	245	30%
Sioux Lookout Hydro Inc.	392			2	3	5	1%
St. Thomas Energy Inc.	1,684	75	205	136	47	463	27%
Thunder Bay Hydro Electricity Distribution Inc.	4,482		289	361	76	726	16%
Tillsonburg Hydro Inc.	654		102	73	14	189	29%
Toronto Hydro-Electric System Limited	65,917	1,794	17,611	10,999	3,946	34,350	52%
Veridian Connections Inc.	9,242	349	2,287	944	80	3,660	40%
Wasaga Distribution Inc.	798	32	166	51	15	264	33%
Waterloo North Hydro Inc.	5,219	235	829	455	214	1,733	33%
Welland Hydro-Electric System Corp.	1,933		275	176	84	535	28%
Wellington North Power Inc.	462	50	114	25	30	219	47%
Westario Power Inc.	2,292			241	194	435	19%
Whitby Hydro Electric Corporation	1,211	162	722	171	17	1,072	89%
Woodstock Hydro Services Inc.		75	227	85	53	440	-

Table 41: Portion of Projects with Standard Incentives

LDC	2011 Projects With Standard Incentives	
	Count	Percent
Algoma Power	5	56%
Atikokan Hydro Inc.	13	35%
Bluewater Power Distribution Corporation	28	3%
Brant County Power Inc.	3	1%
Brantford Power Inc.	20	1%
Burlington Hydro Inc.	24	1%
Cambridge and North Dumfries Hydro Inc.	46	3%
Canadian Niagara Power Inc.	5	1%
Centre Wellington Hydro Ltd.	7	4%

Continued...



LDC	2011 Projects With Standard Incentives	
	Count	Percent
Chapleau PUC	3	14%
Chatham-Kent Hydro Inc.	13	1%
COLLUS Power Corp.	11	2%
E.L.K. Energy Inc.	13	2%
Enersource Hydro Mississauga Inc.	437	6%
EnWin Utilities Ltd.	72	2%
Erie Thames Powerlines Corporation	21	4%
Essex Powerlines Corporation	13	1%
Festival Hydro Inc.	35	4%
Goderich Hydro	6	4%
Greater Sudbury Hydro Inc.	21	4%
Grimsby Power Incorporated	6	4%
Guelph Hydro Electric Systems Inc.	50	3%
Haldimand County Hydro Inc.	16	2%
Halton Hills Hydro Inc.	5	1%
Hearst Power Distribution Company Ltd.	16	50%
Horizon Utilities Corporation	148	2%
Hydro Hawkesbury Inc.	15	60%
Hydro One Networks Inc.	942	4%
Hydro Ottawa Limited	134	2%
Innisfil Hydro Distribution Systems Limited	1	0%
Kenora Hydro Electric Corporation Ltd.	-	0%
Kingston Hydro Corporation	24	4%
Kitchener-Wilmot Hydro Inc.	50	2%
Lakefront Utilities Inc.	32	9%
Lakeland Power Distribution Ltd.	22	8%
London Hydro Inc.	19	0%
Middlesex Power Distribution Corporation	1	0%
Midland Power Utility Corporation	21	7%
Milton Hydro Distribution Inc.	3	0%
Newmarket - Tay Power Distribution Ltd.	22	2%

Continued...





LDC	2011 Projects With Standard Incentives	
	Count	Percent
Niagara Peninsula Energy Inc.	71	6%
Niagara-on-the-Lake Hydro Inc.	35	10%
Norfolk Power Distribution Inc.	29	4%
North Bay Hydro Distribution Limited	62	10%
Northern Ontario Wires Inc.	12	8%
Oakville Hydro Electricity Distribution Inc.	62	2%
Orangeville Hydro Limited	-	0%
Orillia Power Distribution Corporation	22	3%
Ottawa River Power Corporation	18	10%
Parry Sound Power Corporation	7	3%
Peterborough Distribution Incorporated	6	1%
PowerStream Inc.	195	2%
PUC Distribution Inc.	54	15%
Renfrew Hydro Inc.	4	5%
Rideau St. Lawrence Distribution Inc.	15	6%
Sioux Lookout Hydro Inc.	1	20%
St. Thomas Energy Inc.	8	2%
Thunder Bay Hydro Electricity Distribution Inc.	31	4%
Tillsonburg Hydro Inc.	5	3%
Toronto Hydro-Electric System Limited	558	2%
Veridian Connections Inc.	2	0%
Wasaga Distribution Inc.	2	1%
Waterloo North Hydro Inc.	61	4%
Welland Hydro-Electric System Corp.	16	3%
Wellington North Power Inc.	8	4%
Westario Power Inc.	63	14%
Whitby Hydro Electric Corporation	1	0%
Woodstock Hydro Services Inc.	21	5%





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# PARTICIPANT RESPONSE FREQUENCIES

## FIRMOGRAPHICS

SBL participants provided information about their business type, size, and location. Retail (23%), personal services (10%) and automotive sales and services (10%) were the most represented business types among our sample.

Just over half of participant contacts (53%) owned their buildings and either occupied the entire space (38%) or leased parts to other businesses (15%). Business location size ranged from 400 sq. ft. to 100,000 sq. ft. (median 3,000, mean 7,088).

Among the small business owners interviewed, the majority of respondents (74%) described the current overall outlook for their business as either “somewhat” or “highly” favorable. Only a few participants (7%) rated their business outlook as either “somewhat” or “highly” unfavorable. These respondents generally cited slow or inconsistent business (6 responses) or high costs (rent, overhead, operational costs, and marketing; 3 responses) as primary concerns of their businesses’ future success.

## FREQUENCIES

**Q1. How did you first hear of the opportunity to obtain new lighting or hot water heating equipment with assistance from your local distribution company? Did you first hear about it from:**

	Percent (n=204)
A lighting contractor	19%
[your local distribution company] - Direct Mail	18%
[your local distribution company] - Phone call	17%
[your local distribution company] - General	12%
A friend or colleague	13%
An auditor or assessor	6%
From a family member	1%
From a utilities employee	1%
Online/email	1%
Someone came to my door	2%
Other	3%
Don't know/Refused	7%



**Q2. Had you considered purchasing this equipment prior to hearing about the Small Business Lighting program?**

	<b>PERCENT (N=201)</b>
Yes	23%
No	77%

**Q3. What made you decide to participate in the Small Business Lighting program?**

	<b>Percent (n=204)</b>
Saving money on energy bills	63%
Conserving energy / protecting the environment	28%
Getting free equipment [up to \$1000]	31%
No cost to participate	22%
Replacing broken equipment	2%
Acquiring the latest equipment	5%
Seeking improved lighting (quality)	19%
Participation was easy	3%
Other [please specify:]	0%
Other	5%
Don't know/Refused	2%

**Q4. When the assessor or auditor visited your business location, what types of upgrades or changes did you discuss with them?**

	<b>Percent (n=204)</b>
Number of lights/fixtures to be replaced	30%
Type of lights/fixtures to be replaced	79%
Energy savings resulting from the upgrades/changes	10%
How to stay below the \$1000 incentive cap	8%
Prioritizing projects	5%
Cost	6%
Quality of lights/fixtures	16%
Hot water tank inclusion/upgrades	2%
Other [please specify:]	0%
Other	1%
Don't know/Refused	4%



**Q5. Did the assessor or auditor recommend or suggest any other upgrades or equipment change-outs at your site beyond what could be completed within the \$1000 incentive amount?**

	Percent (n=204)
Yes	26%
No	66%
Don't know/Refused	7%

**Q6. What other opportunities were identified?**

	Percent (n=54)
Lights/lighting/bulbs/fixtures/upgrades/additions	63%
Electrical ballast	7%
Hot water heater/tank upgrades	6%
SPECIFY	0%
Other	19%
Don't know/Refused	20%

**Q7. Did your assessor or auditor mention that additional incentives were available for equipment costs above the \$1,000 program incentive cap?**

	Percent (n=54)
Yes	24%
No	52%
Don't know/Refused	24%

**Q8. Did your project exceed the \$1,000 cap?**

	Percent (n=204)
Yes	33%
No	62%
Don't know/Refused	5%



**Q9. Did you have any other business facility upgrade projects in mind? In other words, anything else you were thinking about doing that was not performed during this project?**

	Percent (n=204)
Yes	16%
No	83%
Don't know/Refused	1%

**Q9A. What were you considering?**

	Percent (n=32)
Lights/lighting/bulbs/fixtures/upgrades/additions	41%
Energy Star/efficiency upgrades (unspecified)	6%
Rewiring (unspecified)	6%
Air conditioning/fans	9%
Heat/air ventilator/filter	6%
Heating system/furnace upgrades	19%
Insulation	6%
LED lighting	6%
Propane-fuelled appliances	6%
Solar panels	9%
SPECIFY	0%
Other	25%
Don't know/Refused	0%

**Q9B. And why did you decide to drop these plans?**

	Percent (n=32)
Too expensive	47%
No rebates available	13%
No time	3%
Landlord/property manager approval required	6%
Changed my mind	0%
Still in the planning stage/will carry out at a later date	9%



	Percent (n=32)
Other [please specify:]	0%
Other	9%
Don't know/Refused	25%

**Q10. How would you rate...**

	Not at all satisfied	A little satisfied	Somewhat satisfied	Very satisfied	Extreme- ly satisfied	No opinio n	Don't know/ Refused
The performance of the new equipment that was installed?	1%	1%	8%	59%	27%	2%	1%
The amount you paid out of pocket?	1%	3%	6%	49%	33%	4%	4%
The energy savings your business has experienced since the equipment was installed?	3%	4%	16%	32%	10%	22%	12%
The ease of the paperwork or application?	1%	1%	8%	62%	23%	2%	3%
Your interaction with program contacts?	2%	0%	14%	53%	22%	4%	4%
Clarity of information provided by your assessor?	1%	1%	13%	58%	22%	2%	2%
The quality of the installation work?	1%	2%	4%	62%	28%	0%	1%
Your overall experience with the program?	1%	1%	6%	63%	25%	1%	1%

**On-Site Satisfaction: Q12. I have a few questions about your experience with the SBL program...**

	1 - Not at all satisfied	2	3	4	5 - Very Satisfied	Don't know/ No opinion
Performance of equipment installed (n=71)	1%	0%	6%	28%	61%	4%
Co-pay required (n=71)	0%	1%	0%	6%	28%	65%
Paperwork or application documents (n=71)	0%	0%	8%	27%	55%	10%
Interaction with program contact (n=71)	1%	1%	3%	30%	56%	8%



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	1 - Not at all satisfied	2	3	4	5 - Very Satisfied	Don't know/ No opinion
Clarity of assessment information (n=70)	0%	3%	1%	31%	44%	20%
Quality of installation work (n=71)	0%	0%	4%	21%	73%	1%
Overall program experience (n=71)	0%	1%	6%	35%	54%	4%

**Q13. Did you replace all of the lights at this business location through the Small Business Lighting program?**

	Percent (n=204)
Yes	42%
No	58%
Don't know/Refused	0%

**Q14. What percent of lights at your business location were replaced?**

	Percent (n=204)
5	2%
10	3%
20	8%
25	5%
30	4%
33	1%
34	1%
35	1%
40	7%
45	1%
50	21%
60	5%
65	1%
70	3%
75	4%
80	10%
85	3%
90	11%
95	3%





	Percent (n=204)
98	1%
Don't know/Refused	5%

**Q15. What type(s) of lights were not replaced?**

	Percent (n=119)
Ballast fixtures	3%
Dome lights	2%
Fluorescent lights (e.g. T8, T12, etc.)	55%
Halogen lights	4%
Incandescent/regular/old-style lights	8%
Office lighting (unspecified)	3%
Outdoor/outside lights (unspecified)	3%
Recessed/pot lighting	8%
Sign lights	3%
SPECIFY	0%
Other	17%
Don't know/Refused	18%

**Q16. Are you considering replacing the remaining lights at your business location?**

	Percent (n=119)
Yes	30%
No	58%
Maybe	6%
Don't know/Refused	6%

**Q17. Why aren't you considering replacing the remaining lights?**

	Percent (n=69)
Cost savings are poor/marginal	6%
Have already made replacements/upgrades	9%
Space is leased/it is the landlords decision	9%
Specific energy-efficient product is not available	3%



	Percent (n=69)
They are adequate/functional/do not need to be replaced	20%
They are low usage/in a low-usage area	16%
Too busy/have too much work at the moment	3%
Too costly/financial reasons/budgetary constraints	22%
We moved/are moving	6%
SPECIFY	0%
Other	12%
Don't know/Refused	3%

**Q18. Would you contact [your local distribution company] if you were considering replacing lighting equipment in the future?**

	Percent (n=204)
Yes	71%
No	25%
Don't know/Refused	4%

**Q19. Were you aware of other energy efficiency program opportunities before learning about the Small Business Lighting initiative?**

	PERCENT (N=204)
Yes	22%
No	78%
Don't know/Refused	0%

**Q20. How have you typically learned about energy efficiency program opportunities in the past?**

	Percent (n=44)
Email	5%
Brochure	16%
From a vendor, distributor or contractor	20%
Included with my utility bill	18%
Phone call	7%
Media (such as ads on radio or TV or local billboards)	34%
Web search	23%



	Percent (n=44)
Word of mouth/from family/friends/colleagues	18%
Through the mail	0%
SPECIFY	0%
Other	14%
Don't know/Refused	5%

**Q21. In general, how would you prefer to learn about energy efficiency program opportunities?**

	Percent (n=204)
Email	25%
Brochure	11%
From a sales person, distributor or contractor	10%
Included with my utility bill	21%
Phone call	6%
Media (such as ads on radio or TV or local billboards)	4%
Web search	4%
Word of mouth/from family/friends/colleagues	1%
Through the mail	9%
Other	2%
Don't know/Refused	6%

**Q22. Where do you usually get information about lighting technologies that could save energy and money for your business?**

	Percent (n=204)
Utility	18%
Lighting contractor	11%
Internet	32%
Architect or designer	0%
Trade journals	6%
Electrician	3%
Head office	1%
Newspaper/magazine	5%
Salespeople	1%



	Percent (n=204)
Shops/stores	3%
Suppliers	1%
Television	2%
Through the mail/bill inserts	12%
Word of mouth/from family/friends/colleagues	12%
Other [please specify:]	0%
Other	5%
Don't know/Refused	17%

**Q23. What are most important factors that you consider when purchasing lighting for your business location? Anything else?**

	Percent (n=204)
Cost of lighting fixtures	54%
Return on investment	3%
Available financing	1%
Energy efficiency	45%
Energy savings pay for the project/investment	18%
Utility, provincial, or federal rebates and incentives will pay for the cost	2%
Light quality	42%
Product availability	1%
Durability/light covering	1%
Environmental impact	2%
Life expectancy/how long they last	3%
Look/appearance/style	2%
Maintenance/low maintenance	1%
Safety	1%
Other [please specify:]	0%
Other	4%
Don't know/Refused	5%



**Q24. How important is each of the following aspects when making business equipment purchase decisions...**

	Not at all important	Not very important	Somewhat important	Important	Very important	Don't know/Refused
The initial cost of the equipment?	1%	2%	7%	23%	64%	1%
The payback period?	1%	4%	13%	26%	51%	3%
Lifetime rate of return?	2%	3%	11%	28%	52%	2%
The equipment's effect on greenhouse gases?	3%	6%	20%	30%	38%	3%
A recommendation by a vendor or contractor you trust?	3%	2%	11%	28%	55%	1%
Purchasing a familiar brand?	7%	15%	27%	25%	24%	2%
Having an Energy Star or other environmental label?	5%	8%	11%	35%	38%	2%
A robust warranty?	2%	3%	12%	32%	47%	4%
Overall speed associated with the purchase: How quickly can it be on-site?	1%	6%	14%	31%	44%	2%

**Q25. For the next set of questions I will read a list of equipment and fixtures. Please indicate if they are currently present at your business location...**

	Percent (n=204)
Heating equipment (e.g., Furnace for space heating)	88%
Cooling equipment (e.g., air conditioner for space cooling)	76%
Gas water heating	50%
Electric water heating	52%
An energy management system or other controls such as occupancy sensors	17%
Computer and office equipment (more than one computer)	73%
Commercial cooking equipment	12%
Refrigerator	78%
Freezer	29%
Ventilation fans	63%



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	Percent (n=204)
Air compressor	47%
Cooking ovens	25%
None of the above	0%
Don't know/Refused	0%

**Q26. Have you heard about pending changes to lighting regulations that will result in phasing out less efficient lighting equipment including T-12 lamps and some incandescents?**

	Percent (n=204)
Yes	48%
No	52%

**Q27. Which of the following best characterizes your business?**

	Percent (n=204)
Retail	23%
Personal services (spas, gyms, salons)	10%
Food service	8%
General office	9%
Small Grocery (convenience store, liquor store)	1%
Religious services	4%
Medical or Dental (including mental health)	2%
Veterinary	0%
Laundry	1%
Property management	3%
Accommodation/hospitality	3%
Automotive sales/services	10%
Construction	1%
Farming/agriculture	2%
Government	1%
Industrial	1%
Manufacturing	4%
Recreation/entertainment	2%
Wholesale	1%



	Percent (n=204)
Other	10%
Don't know/Refused	0%

**Q28. Is there specialized energy-using equipment common in your field of business that OPA should consider including in programs designed to serve businesses like yours?**

	Percent (n=204)
Lighting (unspecified)	1%
Cleaning equipment	1%
Cooking/stoves/ovens	1%
Heating/cooling/air conditioning	4%
Hot water tanks	2%
LED lighting	1%
Refrigeration/freezer/cold storage	4%
Yes - (SPECIFY:)	0%
Other	9%
No	78%
Don't know/Refused	2%

**Q29. Does your organization...?**

	Percent (n=204)
Own and occupy the entire building	37%
Own the building and occupy part of it while leasing parts to others	11%
Lease the space	46%
Own the building and lease out the entire space	4%
Don't know/Refused	1%

**Q30. What is the approximate square footage of the business location where you work?**

	Percent (n=204)
400	1%
500	1%
550	0%



	Percent (n=204)
600	1%
700	1%
800	2%
850	0%
900	2%
909	0%
1000	3%
1100	1%
1200	3%
1300	1%
1420	0%
1500	4%
1600	1%
1700	1%
1800	2%
2000	5%
2200	2%
2300	0%
2400	1%
2500	3%
2700	0%
2800	1%
3000	5%
3200	0%
3400	0%
3500	2%
3600	1%
4000	5%
4018	0%
4200	0%
4500	2%
5000	4%
5500	0%
6000	3%



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	Percent (n=204)
6500	1%
7000	1%
7500	0%
8000	0%
9000	0%
10000	3%
10334	0%
11800	0%
12000	0%
14000	0%
15000	1%
16000	0%
18000	1%
20000	1%
21000	0%
25000	0%
30000	0%
32000	0%
35000	0%
40000	1%
50000	1%
60000	0%
100000	1%
Don't know/Refused	14%

**Q31. How would you describe the current overall outlook for your business?**

	Percent (n=204)
Highly unfavorable	2%
Somewhat unfavorable	4%
Neither favorable nor unfavorable	16%
Somewhat favorable	26%
Highly favorable	49%
Don't know/Refused	2%



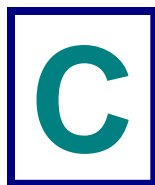
**32. What would you say is your business' current primary concern?**

	<b>Percent (n=204)</b>
Cost savings/saving money	4%
Economy/local economy	9%
Lack of work/demand/falling revenue	11%
Marketing/advertising/attracting new customers	9%
Overhead/operational costs	9%
Rent/paying the rent	4%
Sales/growth/making money	13%
Solvency/sustainability	13%
Other	24%
Don't know/Refused	4%

**Q33. In which of the following areas is your business located?**

	<b>Percent (n=204)</b>
Toronto	4%
Markham/ Vaughan/ Richmond Hill	2%
Other York	2%
Mississauga	8%
Other Peel	2%
Halton	2%
Other Durham	0%
Ottawa	3%
Kingston/ Frontenac	1%
Belleville	1%
Prince Edward/ Northumberland	1%
Other Eastern Ontario	3%
Kitchener/ Waterloo/ Guelph	16%
Niagara	8%
Windsor/ Essex	6%
Hamilton/ St. Catharine's	2%
London/ Middlesex	3%
Other Southwest Ontario	11%
Northern Ontario	20%
Don't know/Refused	2%





# INSTALLER & ASSESSOR RESPONSE FREQUENCIES

## FIRMOGRAPHICS

Nearly all interviewed firms (69 of 70) identified as electrical contractors. As such, we refer to survey contacts as “contractors” throughout the report. Surveyed firms reported an average of just over 10 Ontario employees, with a range from 1 to 100.

Contacts reported on their business outlook. Overall, 40% of contacts reported that their business outlook was favorable, 33% reported it was neutral, and 27% reported it was restricted. Those contractors with medium program project volume (between 16 and 47 program projects) had the least favorable business outlook.

## FREQUENCIES

### Q3. Did you work with the Small Business Lighting program, Power Savings Blitz, in 2010?

	Percent (n=67)
Yes	91%
No	9%

### Q4-8. In the 2011 SBL program, did you...

	Yes	No	DK	Refused
Identify participants	69%	31%	0%	0%
Qualify participants?	54%	46%	0%	0%
Conduct site assessments?	53%	47%	0%	0%
Specify the equipment to be installed?	53%	47%	0%	0%
Install equipment?	100%	0%	0%	0%
Dispose of removed equipment?	99%	1%	0%	0%

### Q5. How did you identify participants?

	Percent (n=48)
Get a list of participants from someone [Who? ]	56%
LDC/Utility tells me where to go	4%
Referrals from existing customers	77%



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	Percent (n=48)
Cold calls	52%
With marketing materials you've developed	6%
Other, specify:	8%

**Q9. Would you say you primarily interact with the program as an Assessor, an Installer, or both roles equally...**

	Percent (n=37)
Primarily assessor	3%
Primarily installer	24%
Do both activities equally or nearly equally	73%

**Q14. Do they express any concerns about the program?**

	Percent (n=70)
No/None	47%
Concerns about the legitimacy of the program	51%
Want to use their own contractor	0%
The incentive will not allow full retrofit (the project will cost more than \$1,050)	0%
Look of the equipment	0%
Quality of the equipment	1%
Tenancy - need to check with landlord or property manager	0%
Longevity - plans for the business to move or close	0%
Something else?	0%

**Q15 What is the most common concern?**

	Percent (n=70)
No/None	47%
Concerns about the legitimacy of the program	51%
Quality of the equipment	1%



**Q17 Have you done projects in leased space?**

	Percent (n=70)
Yes	87%
No	10%
Don't know	3%

**Q18. Do you ever have to obtain approvals from property owners?**

	Percent (n=61)
Yes	66%
No	33%
Don't know	2%

**Q20. Have you done projects in bulk-metered buildings?**

	Percent (n=70)
Yes	53%
No	46%
Don't know	1%

**Q23. How would you describe the equipment choices available for SBL projects: would you say you have...**

	Percent (n=70)
Limited choice or options?	17%
Sufficient number of options.	53%
A wide range of equipment options are available to you.	30%

**Q29. Did the volume of SBL projects you had meet your expectations?**

	Percent (n=70)
Yes	74%
No	24%
Don't Know	1%



**Q32 How do SBL projects differ from projects installed outside the program? ...Is the equipment more energy efficient...**

	Percent (n=70)
Yes	6%
No	94%

**Q33 Is it less efficient?**

	Percent (n=66)
Yes	3%
No	97%

**Q34 Is the equipment higher quality?**

	Percent (n=70)
Yes	6%
No	94%

**Q35 Is it lower quality?**

	Percent (n=66)
Yes	2%
No	98%

**Q36 Are the projects larger?**

	Percent (n=70)
Yes	7%
No	93%

**Q37 Are the businesses smaller?**

	Percent (n=70)
Yes	94%
No	6%



**Q39b Are you aware that in 2011, small businesses participating in the Small Business Lighting program were eligible to apply for Standard Incentives above the \$1000 dollar cap?**

	Percent (n=70)
Yes	84%
No	11%
Don't know	4%

**Q40 How often do you suggest this to your customers?**

	Percent (n=59)
Other:	100%

**Q46 Who is your primary contact for Small Business Lighting? Is it...**

	Percent (n=70)
Someone at an implementation firm (such as Nedco, Sonepar, Energy Shop, Burman Energy): Which ones?	100%

**Q47 Do you ever interact directly with the local utilities about the program?**

	Percent (n=70)
Yes	30%
No	70%

**Q48 How often do you typically interact?**

	Percent (n=21)
Daily	5%
Weekly	38%
Monthly	33%
Less often	10%
Varies	10%
Other	5%



**Q49 How do you typically communicate with local utilities about SBL?**

	Percent (n=21)
Email	38%
Phone	52%
In person	10%

**Q50 And what is the most common reason you communicate with the LDC directly?**

	Percent (n=21)
Questions about eligibility	57%
Payments and invoices	10%
Something else?	33%

**Q51 Do you upload information into the database yourself?**

	Percent (n=70)
Yes	20%
No	79%
Don't know	1%

**Q56 Please rate your agreement with the following statements...**

	1 Strongly disagree	2	3	4	5 Strongly agree
The reimbursement rates cover my costs.	7%	4%	34%	33%	21%
I receive reimbursement from the program in a timely manner.	7%	10%	20%	14%	49%
Overall, I am satisfied with the SBL program.	4%	3%	16%	43%	34%
I intend to continue to install lighting through this program in the future.	1%	1%	10%	16%	71%
The program paperwork is reasonable.	6%	6%	24%	26%	39%
Program rules are clear.	0%	6%	9%	29%	57%





**Q60 How would you categorize the primary contracting expertise of your company: is your organization....?...**

	Percent (n=70)
Lighting	4%
Something else, specify:	96%

**Q61. Do you ever recommend or install...**

	Percent (n=70)
HVAC equipment	26%
Refrigeration	14%
Cooking equipment	11%
Rooftop ACs	24%
Energy management systems and controls	36%
Lighting controls	81%
Advanced lighting solutions (calculations that include daylighting, demand response opportunities, occupancy or photocell controls)	96%

**Q62 I will read 3 statements. Please tell me which one best matches your opinion.**

	Percent (n=70)
Current economic conditions are favorable for my company's growth and profitability.	40%
Current economic conditions are neutral for my company's growth and profitability.	33%
Current economic conditions are likely to restrict my company's growth and profitability.	27%

**Q65 Have you added any staff since January, 2011 because of your engagement with SBL?**

	Percent (n=70)
Yes	26%
No	74%

**Q66\_1 How many?-Full-time [optional comment:]**

	Percent (n=17)
0	6%
1	53%



	Percent (n=17)
2	6%
3	6%
4	18%
5	6%
10	6%

**Q66\_2 How many?-Part Time**

	Percent (n=18)
0	61%
1	17%
2	6%
3	6%
5	6%
7	6%

**Q66b Just to confirm, if you had NOT done any work with SBL in 2011, you would not have hired those [X] p...**

	Percent (n=16)
Correct	100%

**Q67 Have you avoided reducing staff or layoffs in 2011 because of your engagement with SBL?**

	Percent (n=70)
Yes	39%
No	61%

**Q68\_1 How many?-Full-time**

	Percent (n=70)
0	4%
1	31%
2	19%



	Percent (n=70)
3	8%
4	15%
5	8%
6	8%
10	4%
15	4%

**Q68\_2 How many?-Part time (optional comment:)**

	Percent (n=27)
0	89%
2	4%
5	7%

**Q69 I want to confirm that you are aware that beginning in July 2012, T12s will no longer be manufactured.**

	Percent (n=70)
Aware	89%
Not aware	11%

**Q72 How do SBL jobs compare to your other work in terms of profitability?**

	Percent (n=69)
Somewhat more profitable	1%
About the same	48%
Somewhat less profitable	43%
Much less profitable	7%





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# SITE INSPECTION DATA COLLECTION FORMS

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Appendix D presents the forms that were used by field engineers to collect data on-site (see next page). This information was used to calculate realization rates for both energy and demand savings for each site.



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<b>OPA SBL: 2011-2012 Lighting Calculator</b>	
<input type="checkbox"/> = input from tracking database	
<input type="checkbox"/> Submission ID	
Date of Survey (mm/dd/yyyy)	
<input type="checkbox"/> LDC (select from dropdown)	
<b>Site Contact Information</b>	
<input type="checkbox"/> <b>Business Info.</b>	
Business Name	
Street Address	
City	
Postal Code	
Phone (no dashes)	
<b>Contact #1</b>	
Name	
Title	
Phone (no dashes)	
<b>Contact #2</b>	
Name	
Title	
Phone (no dashes)	
<b>Questions?</b>	
Dave Dickensheets	Ron Shaw



<b>General Facility Info:</b>			
DB	Building Type		
Building Area (ft <sup>2</sup> )			
# of Floors			
Year Built			
Heating Fuel		Other:	
<i>Types: Electric, Nat. Gas, Oil, Wood, Other (If "Other", explain)</i>			
Heating Equipment		Other:	
<i>Types: Packaged, Boiler, Furnace, Heat Pump, Elec. Resistance, Other, None (If "Other", explain)</i>			
Cooling Equipment		Other:	
<i>Types: Packaged, Chiller, Split, Heat Pump, Evap., Window, PTAC, Other, None (If "Other", explain)</i>			
<b>General Comments:</b>			



<b>Operating Schedules</b>		
<b>1. Seasons</b>		
<i>mm/dd/yyyy</i>	<b>Begin Date</b>	<b>End Date</b>
Season 1:		
Season 2:		
Season 3:		
Please double-check your dates		
<b>2. Holidays when the business is <i>CLOSED</i> (enter yes/no for each holiday)</b>		
<i>Enter "Yes" if the business is <b>closed</b> on the holiday.</i>		
<b>Date</b>	<b>Holiday</b>	<b>Business Closed?</b>
1/3/11	New Year's Day	
2/21/11	Family Day	
4/22/11	Good Friday	
4/25/11	Easter Monday	
5/23/11	Victoria Day	
7/1/11	Canada Day	
8/1/11	Civic Holiday	
9/5/11	Labour Day	
10/10/11	Thanksgiving	
11/11/11	Remembrance Day	
12/26/11	Boxing Day	
12/27/11	Christmas Day	





<b>3. Areas</b>	<b>Area Descriptions (e.g., "Office," "Warehouse")</b>						
	Area 1:						
	Area 2:						
	Area 3:						
	If more than 3 areas, try to combine areas with identical operating hours.						
	<b>Area 1 Lighting Operating Hours*</b>						
	<b>Day Type</b>	<b>Season 1</b>		<b>Season 2</b>		<b>Season 3</b>	
		From	To	From	To	From	To
	Sunday						
	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Holiday						
	*Please enter all times in incremental hours 1-24, e.g. 5:30pm = 17.5						
	Regarding occupancy sensors: enter the <b>baseline</b> operating schedule.						
	<b>Area 2 Lighting Operating Hours</b>						
	<b>Day Type</b>	<b>Season 1</b>		<b>Season 2</b>		<b>Season 3</b>	
		From	To	From	To	From	To
	Sunday						
	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Holiday						
	<b>Area 3 Lighting Operating Hours</b>						
	<b>Day Type</b>	<b>Season 1</b>		<b>Season 2</b>		<b>Season 3</b>	
		From	To	From	To	From	To
	Sunday						
	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Holiday						



Small Business Lighting Measures							
<i>If you do not have the information and it cannot be estimated, enter "DK"</i>							
1. Separate Ballast Fluorescent/MH Measures							
	Item:	1	2	3	4	5	6
	Area # from Operating Schedules:						
	HOBO Serial Number:						
RETROFIT	Baseline Type (T12, T12HO, T8, etc.)						
	Lamps per Fixture						
	Lamp Wattage						
	Ballast Type (magnetic, electronic)						
	Fixture Count						
BASELINE	Fixture/Measure Description						
	Lamps per Fixture						
	Lamp Wattage						
	Ballast Mfg. & Model Number						
	Ballast Type (magnetic, electronic)						
Fixture Count							



Small Business Lighting Measures							
<i>If you do not have the information and it cannot be estimated, enter "DK"</i>							
<b>4. Water Heating Measures</b>							
	Item:	1	2	3	4	5	6
Water Heater	No insulation pre-retrofit? (Y/N)						
	Confirm electric heater (Y/N)						
	Tank size (gal)						
Pipe Insulation	Retrofit with insulation? (Y/N)						
	No insulation pre-retrofit? (Y/N)						
	Confirm electric heater (Y/N)						
Aerator	Pipe Diameter (in.)						
	Length of insulation (ft.)						
	Length of Pipe Not Insulated (ft.)						
	Confirm electric heater (Y/N)						
	Baseline GPM (if possible)						
	Retrofit GPM						
	Count						
	Water Temp Setpoint (°C)						
	Energy Factor (to be found later)						
	Liters of Aerator Use per Year						





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# MEASURE SAVINGS ASSUMPTIONS

The table in Appendix E shows a list of assumptions that were used to calculate Reported Gross Savings for the 2011 evaluation. These values were presented by the OPA in their 2011 Small Business Lighting Assessment Calculator.

- ➔ Measure Code: The code assigned to each measure in the SBL database.
- ➔ Pre-Watts: The assumed baseline wattage for a given measure.
- ➔ Post-Watts: The assumed retrofit wattage of the efficiency measure.
- ➔ Wattage Savings:  $Wattage\ Savings = Pre-Watts - Post-Watts$ , or the assumed savings for a given measure.
- ➔ Technology Category: The technology category identifies the category that each measure is included in for hours of use calculations. These designations were assigned by Nexant, Inc. for each measure. More detail on these calculations can be found in the body of the report.

**Table 42: Savings Assumptions**

Measure Number	Measure Code	Pre-Watts	Post-Watts	Wattage Savings	Technology Category
1	m_010_010	95	50	45	T8
2	m_010_020	95	46	49	T8
3	m_010_030	95	45	50	T8
4	m_010_040	172	101	71	T8
5	m_010_050	172	71	101	T8
46	m_010_060	368	143	225	T8
48	m_010_070	172	112	60	T8
49	m_010_080	368	228	140	T8
68	m_010_090	172	111	61	T8
6	m_020_010	142	101	41	T8
7	m_020_020	142	71	71	T8
50	m_020_030	142	112	30	T8
51	m_020_040	368	228	140	T8
69	m_020_050	142	90	52	T8

Continued...



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Measure Number	Measure Code	Pre-Watts	Post-Watts	Wattage Savings	Technology Category
8	m_030_010	51	26	25	T8
9	m_030_020	88	36	52	T8
10	m_030_030	88	50	38	T8
11	m_030_040	175	71	104	T8
12	m_030_050	175	101	74	T8
70	m_030_060	51	23	28	T8
71	m_030_070	88	45	43	T8
72	m_030_080	175	90	85	T8
13	m_040_010	47	26	21	T8
14	m_040_020	81	36	45	T8
15	m_040_030	81	50	31	T8
16	m_040_040	149	71	78	T8
17	m_040_050	149	101	48	T8
73	m_040_060	47	23	24	T8
74	m_040_070	81	45	36	T8
75	m_040_080	149	90	59	T8
18	m_050_010	87	60	27	T8
19	m_050_020	87	29	58	T8
20	m_060_010	30	3	27	Exit
21	m_060_020	30	3	27	Exit
22	m_070_010	40	11	29	CFL
23	m_070_020	60	13	47	CFL
24	m_070_030	100	23	77	CFL
25	m_070_040	150	30	120	CFL
26	m_080_010	60	13	47	CFL
27	m_080_020	75	18	57	CFL
28	m_080_030	100	26	74	CFL
29	m_090_010	60	13	47	CFL
30	m_090_020	60	32	28	CFL
31	m_090_030	75	18	57	CFL
32	m_090_040	75	50	25	CFL
33	m_090_050	90	25.5	65	CFL

Continued...



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Measure Number	Measure Code	Pre-Watts	Post-Watts	Wattage Savings	Technology Category
34	m_090_060	90	60	30	CFL
35	m_090_070	100	26	74	CFL
36	m_090_080	100	62.5	38	CFL
65	m_090_090	60	30.5	30	CFL
37	m_100_010	354	0	354	Tank
38	m_100_020	151	0	151	Tank
39	m_100_030	600	0	600	Pipe
40	m_110_010	34	0	34	Aerator
41	m_120_010	0	0	0	Contractor
42	m_120_020	0	0	0	Contractor
43	m_120_030	0	0	0	Contractor
44	m_120_040	0	0	0	Contractor
45	m_120_050	0	0	0	Contractor
47	m_120_060	0	0	0	Contractor
52	m_130_010	78	45	33	T8
76	m_130_020	156	90	66	T8
53	m_140_010	120	88	32	T8
54	m_140_020	205	172	33	T8
55	m_150_010	175	150	25	T8
56	m_150_020	400	360	40	T8
57	m_155_010	275	170	105	T8
58	m_155_020	450	223	227	T8
59	m_160_010	40	11	29	CFL
60	m_160_020	60	13	47	CFL
61	m_160_030	100	23	77	CFL
62	m_160_040	150	28	122	CFL
63	m_170_010	70	15	55	CFL
64	m_170_020	125	24	101	CFL
66	m_180_010	0	0	0	Contractor
67	m_180_020	0	0	0	Contractor





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# INTERACTIVE ENERGY CHANGES FOR LIGHTING RETROFITS

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Based on the information that is currently tracked by the OPA, the Evaluation Team and the OPA agreed that the most defensible methodology would calculate interactive energy changes for lighting retrofits only. These energy changes have been included in verified savings estimates and initiative cost effectiveness assessments.

## INTRODUCTION

The OPA's CONSERVATION programs incentivize the implementation of equipment whose efficiency is above that which a customer might otherwise install. By definition, this equipment should consume less input energy per unit of output energy. However, the energy consumption of equipment in an enclosed space cannot be viewed in isolation. Building systems interact with one another and a change in one system can affect the energy consumption of another. This interaction is important to consider when calculating the benefits provided by CONSERVATION programs because it adopts a comprehensive view of societal-level energy changes rather than limiting the analysis to the energy change directly related to the modified equipment. In fact, both the OPA Evaluation Measurement and Verification (EM&V) Protocols and CDM Cost Effectiveness Guide state that interactive energy changes should be quantified and accounted for whenever possible.

Interactive energy changes can come in a number of forms. A measure that directly saves electricity may cause another building system to consume less electricity. Alternatively, a measure that directly saves electricity could cause another building system fired by natural gas to consume more energy. In the case of the SBL Program, the Evaluation team considered the interactive energy changes produced by installing more efficient lighting. When considering energy efficient lighting, the direct energy change to the system is a reduction in wattage of the lighting equipment being used. Interactively, this also creates a reduction in the heat load of the room containing the lights. As a result, possible interactive energy changes would be reduced cooling load in the summer and increased heating load in the winter.

However, interactive energy changes are neither calculated nor tracked on a consistent basis by participants or the OPA. This makes it very difficult for an evaluator to produce estimates of total interactive energy changes for the overall population of participant retrofits because there are no reported savings values from which to create realization rates. This forces an evaluator to use the average of a sample to evaluate overall population interactive savings.



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## METHODOLOGY

In order to remain consistent with other calculations for the evaluation, the Evaluation Team chose to conduct a separate analysis for each lighting stratum in the 2011 impact sample. The following steps were taken for each stratum:

- ➔ Import 8760 lighting load shape and total lighting savings information into the Evaluation Team's purpose-built analysis tool.
- ➔ Import 8760 weather information for the city of Toronto (assumed to represent the average conditions faced by participant buildings).
- ➔ Screen lighting savings to only those hours where outdoor temperature exceeds an assumed cooling threshold, or falls below an assumed heating threshold.
- ➔ Create an interactive cooling energy change load profile by assuming a cooling efficiency, the percent of total lighting savings occurring in conditioned spaces, and a cooling interactive factor that relates the percent of total lighting energy that is converted to heat and must be removed by the cooling equipment.
- ➔ Create an interactive electrical heating energy change load profile by assuming a heating coefficient of performance (COP), the percent of total lighting savings occurring in conditioned spaces, a heating interactive factor which relates the percent of total lighting energy that is converted to heat and offsets heating plant load, and the saturation of electric space heating. Total annual natural gas heating energy changes were calculated in the same way, while taking into consideration the different end-use saturation and heating system efficiency.

Table 43 and Table 44 list the assumptions used in the interactive energy analysis by strata. For the SBL Program all customers had to fall under a 50kW threshold for demand. As a result, the assumption was made that most equipment would be smaller in nature. All assumptions about heating or cooling efficiencies were made accordingly.

**Table 43: Interactive Energy Changes for Lighting Retrofits – Common Assumptions**

Metric	Value
Cooling Above (°F)	60
Cooling Interactive Factor *	48%
Heating Below (°F)	55
Electrical Heating System Efficiency (COP)	0.98
Saturation of Electric Space Heating	10%
Natural Gas Heating Efficiency (AFUE)	80%
	Continued...



Metric	Value
Saturation of Natural Gas Space Heating	90%
Heating Interactive Factor *	29%

\* Cooling and Heating Interactive Factors represent the amount of lighting energy turned to heat that must be removed by the cooling system or offsets the load on the heating system. Factors taken from "Interactions between lighting and space conditioning energy use in U.S. Commercial Buildings" LBNL-39795. April 1998.

**Table 44: Interactive Energy Changes for Lighting Retrofits – Assumptions by Stratum**

Stratum	% of Overall Lighting Savings in Conditioned Space	Cooling Efficiency (kW/ton)
Small	100%	1.165 *
Medium	100%	1.165 *
Large	100%	1.165 *

\* OEB 2006 minimum efficiency for a 10-ton RTU – 10.3 EER

The interactive energy change analysis was performed on an hourly basis for the entire year so that load shapes could be incorporated into the initiative cost effectiveness analysis.

## RESULTS

Table 45 displays the resulting savings factors used by the Evaluation Team to calculate total interactive energy changes at the stratum level. All values are expressed in terms of a unit of savings in interactive equipment energy per unit savings in lighting energy consumption.

**Table 45: Analysis Results: Interactive Equipment Energy Savings**

Lighting Stratum	Space Cooling Electrical Energy	Space Heating Electrical Energy	Space Heating Natural Gas Energy	Total Energy
Small	0.057	-0.017	-0.182	-0.142
Medium	0.058	-0.016	-0.181	-0.140
Large	0.056	-0.017	-0.182	-0.145
<b>Weighted Average *</b>	<b>0.057</b>	<b>-0.017</b>	<b>-0.184</b>	<b>-0.14</b>
LBNL Study **	0.19	-0.09	-0.32	-0.25

\* Weighted by total verified lighting energy savings

\*\* "Interactions between lighting and space conditioning energy use in U.S. Commercial Buildings" LBNL-39795. April 1998.



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The results of the analysis show that, on average, a decrease in lighting energy consumption by 1 kWh will only reduce total building energy consumption by approximately 0.86 equivalent-kWh (includes energy changes from natural gas heating). In other words, the decrease in lighting energy consumption is partially offset by a net increase in energy consumption from the interactive building equipment.

Values from the LBNL study of lighting interactive energy changes in the United States were included in Table 45 for comparison purposes. The results of our analysis prove to be conservative when one considers the lower overall energy increase despite a longer Canadian heating season.

Changes in peak electrical power consumption were also incorporated into the analysis. Peak periods were defined according to the OPA EM&V protocols. Table 46 displays the estimated interactive equipment peak kW savings per savings in lighting peak kW.

**Table 46: Analysis Results: Interactive Equipment Peak Savings**

Lighting Stratum	Summer Peak kW	Winter Peak kW
Small	0.157	-0.030
Medium	0.157	-0.030
Large	0.157	-0.030
<b>Weighted Average *</b>	<b>0.157</b>	<b>-0.03</b>

\* Weighted by total verified lighting summer/winter peak savings.

Thus, lighting savings will have an additive effect on total building summer power savings due to cooling load effects. Our analysis shows that a 1 kW reduction in lighting power consumption will reduce total building power consumption by approximately 1.16 kW in the summer peak period, on average.





# DEVELOPMENT OF LOAD PROFILES

All analyses for the impact evaluation were conducted at the hourly level so that 8760 load shapes could be created. Average 8760 load shapes will be provided to the OPA in Microsoft Excel format under separate cover. The following table displays the weighted average sample load shapes for each impact stratum aggregated to the OPA-defined time-of-use periods. It also includes the stipulated load shapes used for certain measures that did not appear in the impact sample.

**Table 47: Impact Evaluation Load Profiles**

Stratum	Winter			Summer			Shoulder	
	Peak	Mid-Peak	Off-Peak	Peak	Mid-Peak	Off-Peak	Mid-Peak	Off-Peak
<b>PRESCRIPTIVE</b>								
Lighting *	8.6%	13.3%	11.0%	13.1%	9.7%	10.8%	21.5%	11.9%
Water Heating **	9.2%	10.8%	16.9%	5.6%	9.0%	14.7%	17.8%	16.0%

\* Based on average 8760 load profile generated from on-site sample data.

\*\* From Quasi-Prescriptive Measures and Assumptions List.

Note: Stipulated as the OPA load shapes defined in the Prescriptive and Quasi-Prescriptive Measures and Assumptions documents



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# LIFETIME SAVINGS: ADJUSTED FUTURE BASELINES

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In the typical early replacement scenario, the baseline is often defined as the existing equipment. But, the remaining useful life (RUL) of the existing equipment is often less than the effective useful life (EUL) of the retrofit equipment. Therefore, in the absence of the retrofit project, the participant would have had to replace the existing equipment anyway sometime during the timeframe of the retrofit EUL.

If the baseline equipment efficiency is expected to change during the RUL of the existing equipment because of a market shift, then the lifetime savings calculation should account for this shift in order to accurately reflect what would have happened in absence of the program. This assumed new baseline can be defined by the equipment option that the average market participant would adopt in the absence of the rebate program – but what that option is can be influenced by a number of factors that change over time, including typical consumer behavior and government regulations.

In the case of lighting retrofit measures, upcoming and recently implemented efficiency code changes are expected to accelerate a baseline shift for certain technologies.

It is important to note that the timing of baseline adjustments is not fixed by the implementation date of government regulations. It may take some time for the stock of inefficient equipment to remove itself from retailer distribution pipelines, and even longer to remove itself from service in Canadian facilities. Therefore, in the case of code changes, the baseline shift occurs when a certain technology is no longer available to the average consumer.

## CANADIAN ENERGY EFFICIENCY REGULATIONS

Existing and upcoming regulations issued by Natural Resources Canada (NRCAN) for compact and linear fluorescent lamps may have a significant impact on the market for efficient equipment in Ontario. Those regulations are detailed below.

### Linear Fluorescent Lighting

CSA standard CAN/CSA-C654-M91 (amended 2001) set minimum ballast efficacy factors (BEF) levels that took effect in April 2005. The intent of these regulations was to eliminate the use of inefficient T12 fluorescent magnetic ballasts, such as those used to operate 4-foot 40-watt or 8-foot 75-watt T12 lamps. This standard was subsequently updated to harmonize BEF levels with U.S. Energy Policy Act of 2005 (EPA 2005) efficacy levels.



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The effect of this legislation has been to reduce the saturation of magnetic ballasts in Canada. As old ballasts fail, facility managers must upgrade their equipment to more efficient electronic ballasts. However, the useful lives of most ballasts are on the order of 50,000 hours. Therefore, under this standard alone, magnetic ballasts may persist in service for many years to come.

NRCAN has also proposed to amend Canada's Energy Efficiency Regulations for general service fluorescent lamps. The regulations would apply to most 2-foot, 4-foot, and 8-foot lamps, and were supposed to be effective for lamps manufactured on or after July 14, 2012<sup>23</sup>, but as of the writing of this report, they have not been adopted. Nevertheless, the regulations have been adopted in the United States, which is the main supplier of T12 lamps to Canada.

According to Sylvania, one of the largest lighting equipment manufacturers in the world, the proposed regulations would eliminate the manufacture and sale of most T12 lamps and even some lower performing T8 lamps<sup>24</sup>.

### Incandescent and Compact Fluorescent Lighting

In 2008, an amendment to Canada's Energy Efficiency Regulations<sup>25</sup> was enacted that would affect general service lighting (GSL) manufactured for sale in 2012. The amendment aimed to move the lighting market away from inefficient technologies, and harmonize minimum efficacy standards for GSL with the United States. In practice, the standards will eliminate the manufacture of many traditional incandescent technologies in favor of more efficient alternatives, such as halogen or compact fluorescent lamps (CFL). The implementation date for these standards has recently been delayed to January 1, 2014 for 100W and 75W bulbs, and December 31, 2014 for 60W and 40W bulbs<sup>26</sup>. Table 48, below, details the standards and technologies affected.

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<sup>23</sup> Natural Resources Canada. General Service Fluorescent Lamps Bulletin on Developing Standards. May 2010. <http://oee.nrcan.gc.ca/regulations/bulletins/12997>

<sup>24</sup> <http://assets.sylvania.com/assets/Documents/Prod%20%20Leg%20%20-%20DOE%20rulemaking%204-14-11.c0d4e84f-f7ac-493b-bdb7-a04bce0bcbeb.pdf>

<sup>25</sup> Amendment to the *Energy Efficiency Regulations*. Published on December 24, 2008 in the *Canada Gazette, Part II*. Vol. 142, No. 26. SOR/2008-323. <http://www.gazette.gc.ca/rp-pr/p2/2008/2008-12-24/html/sor-dors323-eng.html>

<sup>26</sup> Amendment 12 to the *Energy Efficiency Regulations*. Published on November 9, 2011 in the *Canada Gazette, Part II*. Vol. 145, No. 23. SOR/2011-228. <http://canadagazette.gc.ca/rp-pr/p2/2011/2011-11-09/html/sor-dors228-eng.html>





Table 48: General Service Lamp Standards

Rated Lumens	Min Rated Lifetime	Effective Date	Wattage of Traditional Incandescent that Will Not Meet Requirements
1490-2600	1000 hours	1/1/2014	100
1050-1489	1000 hours	1/1/2014	75
750-1049	1000 hours	12/31/2014	60
310-749	1000 hours	12/31/2014	40

## BASELINE ADJUSTMENTS

### Linear Fluorescent Lighting

While linear fluorescent lamp efficiency standards have not yet been adopted, the Evaluation Team has adjusted future baselines in this technology for two reasons:

- ➔ Regulations in the United States have been adopted. Since Canada imports most of its T12 lamps from U.S. manufacturers, the lighting market in Canada is expected to be similarly affected.
- ➔ The standards are generally expected to be adopted in Canada in the future

The timing of the baseline shift is difficult to determine because of the uncertainty surrounding the adoption of the code changes and the uncertainty around when T12 technology will truly be removed from the marketplace. Once manufacturing stops, it will still take time for the inventory to be removed from distribution pipelines, and therefore the implementation of the code changes will not coincide with their removal from the marketplace. Furthermore, once installed, a T12 lamp still has many years of RUL in which it still acts as a viable baseline to T8s.

A number of jurisdictions in the United States have been grappling with this issue. The following table details when some of these jurisdictions have chosen to adjust the baseline of T12 technologies.

Table 49: Timing of Linear Fluorescent Baseline Shift for Other Jurisdictions

Jurisdiction	Timing of Baseline Shift
Vermont	2015
Northwest Regional Technical Forum	2016
Oregon	2017



For this evaluation, the Evaluation Team first assumed that the RUL of the T12 equipment is the life of the lamp at 20,000 hours. With approximately 4,000 hours of use per year, this translates to an RUL of 5 years from the installation year of 2011 (baseline shift in 2016). However, due to the uncertainty surrounding the Canadian codes, the Evaluation Team chose to adopt a more conservative approach and adjust the baseline in 2017.

Once the baseline shift occurs, the applicable minimum efficiency is assumed to be a standard-performance T8 fixture with 32 watt lamps.

### Incandescent and Compact Fluorescent Lighting

The Evaluation Team adopted a similar methodology when estimating baseline adjustments for compact fluorescent lighting. However, because the existing baseline technology (incandescent or halogen lamps) has a very short lifetime, the baseline shifts will occur much sooner.

Incandescent and halogen lamps have lifetimes on the order of 1,000 to 2,000 hours. Assuming 2,500 hours of operating per year for a commercial facility, the RUL on these lamps is less than 1 year. To account for the time it will take for inventory to sell, the Evaluation Team assumed that 1 year after the code changes take effect, the market baseline will shift. The following table shows the assumed timing for the baseline shifts.

**Table 50: Timing of Compact Fluorescent Baseline Shift**

Wattage of Traditional Incandescent That Will Not Meet Requirements	Rated Lumens	Code Effective Date	Assumed Baseline Shift
100	1490-2600	1/1/2014	2015
75	1050-1489	1/1/2014	2015
60	750-1049	12/31/2014	2016
40	310-749	12/31/2014	2016

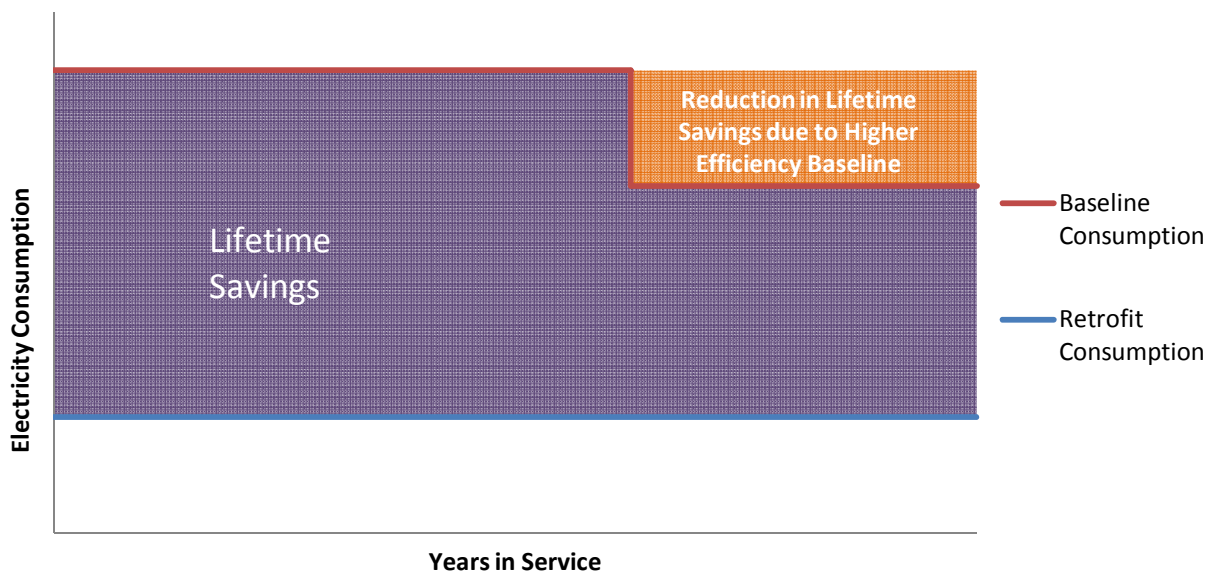
To estimate the wattage of the adjusted baseline condition, the Evaluation Team used the definition included in the adopted codes. The formula is  $4.0357 * \text{natural logarithm} [\text{lumen output}] - 7.1345$ .

### LIFETIME SAVINGS CALCULATION

Once the timing of the baseline adjustments and the adjusted power consumption were determined, the lifetime savings calculation was modified to account for the adjustments. The resulting calculation is illustrated in Figure 6, below.



Figure 6: Illustration of Adjusted Lifetime Savings Calculation



The formula used in the calculations is reproduced below:

$$Lifetime\ Savings = RUL * 1st\ Yr\ Savings + (EUL - RUL) * Adj.\ Savings$$

where:

- RUL* = Remaining useful life of existing equipment
- EUL* = Effective useful life of retrofit equipment
- 1<sup>st</sup> Yr Savings* = verified savings in first year of measure installation
- Adj. Savings* = savings of measure after the assumed baseline adjusts to a higher efficiency

The following table lists each technical measure included in the SBL Program and the corresponding details regarding the baseline adjustments, if applicable.

- ➔ Original EUL: The EUL of the baseline measure as described in the OPA Quasi-Prescriptive Document
- ➔ EUL of First Year Savings: The length of time between the installation of the retrofit equipment and the savings adjustment
- ➔ Original Savings: The original assumed savings value without any baseline adjustment.
- ➔ Adjusted Savings: The assumed savings value after the savings adjustment.



Table 51: Adjusted Baseline Assumptions

OPA Measure Number	Measure Code	Original EUL	EUL of First Year Savings	Original Savings	Adjusted Savings
1	m_010_010	12	6	45	8
2	m_010_020	12	6	49	12
3	m_010_030	12	6	50	13
4	m_010_040	12	6	71	11
68	m_010_090	12	6	61	1
5	m_010_050	12	6	101	41
46	m_010_060	12	6	225	85
48	m_010_070	12	6	60	0
49	m_010_080	12	6	140	0
6	m_020_010	12	6	41	11
69	m_020_050	12	6	52	22
7	m_020_020	12	6	71	41
50	m_020_030	12	6	30	0
51	m_020_040	12	6	140	0
8	m_030_010	12	6	25	3
70	m_030_060	12	6	28	6
9	m_030_020	12	6	52	20
10	m_030_030	12	6	38	6
71	m_030_070	12	6	43	11
11	m_030_040	12	6	104	37
12	m_030_050	12	6	74	7
72	m_030_080	12	6	85	18
13	m_040_010	12	6	21	3
73	m_040_060	12	6	24	6
14	m_040_020	12	6	45	20
15	m_040_030	12	6	31	6
74	m_040_070	12	6	36	11
16	m_040_040	12	6	78	37
17	m_040_050	12	6	48	7
75	m_040_080	12	6	59	18

Continued...



OPA Measure Number	Measure Code	Original EUL	EUL of First Year Savings	Original Savings	Adjusted Savings
52	m_130_010	12	N/A	33	N/A
76	m_130_020	12	N/A	66	N/A
53	m_140_010	12	N/A	32	N/A
54	m_140_020	12	N/A	33	N/A
55	m_150_010	5	N/A	25	N/A
56	m_150_020	5	N/A	40	N/A
57	m_155_010	12	N/A	105	N/A
58	m_155_020	12	N/A	227	N/A
18	m_050_010	12	6	27	0
19	m_050_020	12	6	58	0
22	m_070_010	3	5	29	24
23	m_070_020	3	5	47	29
24	m_070_030	3	4	77	46
25	m_070_040	3	4	120	48
59	m_160_010	12	5	29	24
60	m_160_020	12	5	47	29
61	m_160_030	12	4	77	46
62	m_160_040	12	4	122	50
63	m_170_010	3	N/A	55	N/A
64	m_170_020	3	N/A	101	N/A
26	m_080_010	3	N/A	47	N/A
27	m_080_020	3	N/A	57	N/A
28	m_080_030	3	N/A	74	N/A
29	m_090_010	3	5	47	22
65	m_090_090	2	N/A	29.5	N/A
30	m_090_020	2	N/A	28	N/A
31	m_090_030	3	4	57	41
32	m_090_040	1	4	25	9
33	m_090_050	3	N/A	64.5	N/A
34	m_090_060	2	N/A	30	N/A
35	m_090_070	3	4	74	43

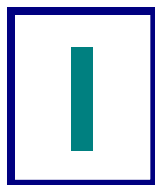
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OPA Measure Number	Measure Code	Original EUL	EUL of First Year Savings	Original Savings	Adjusted Savings
36	m_090_080	1	4	37.5	7
20	m_060_010	10	N/A	27	N/A
21	m_060_020	10	N/A	27	N/A
37	m_100_010	N/A	N/A	N/A	N/A
38	m_100_010	N/A	N/A	N/A	N/A
39	m_100_010	N/A	N/A	N/A	N/A
40	m_110_010	N/A	N/A	N/A	N/A





## RESULTS MAPPING TO LDC

The following table shows the impact evaluation results by LDC. The overall stratum or measure-level impact sample realization rates for energy and demand were applied at the stratum/measure level for each LDC. Similarly, stratum-level interactive lighting energy change factors were applied at the stratum level for each LDC.

The Evaluation Team understands that all LDCs face efficiency targets for the 2011-2014 CDM cycle. Therefore, the following table includes cumulative savings estimates to 2014 (for energy) and remaining savings estimates at 2014 (demand) so that LDCs can track their progress against their targets.

**Table 52: Impact Results by LDC**

LDC	Net Verified Energy Savings (Annual kWh)	Net Verified Energy Savings (Lifetime kWh)	Net Verified Energy Savings (Cumulative to 2014 kWh)	Net Verified Summer Demand Savings (Annual kW)	Net Verified Summer Demand Savings (Remaining in 2014 kW)
Algoma Power	28,866	235,688	112,202	11	9
Atikokan Hydro Inc.	69,638	455,208	277,056	28	27
Bluewater Power Distribution Corporation	238,084	1,502,565	918,885	92	80
Brant County Power Inc.	9,616	69,172	38,464	4	4
Brantford Power Inc.	412,361	2,868,187	1,540,646	159	123
Burlington Hydro Inc.	289,029	2,265,960	1,096,148	112	92
Cambridge and North Dumfries Hydro Inc.	398,982	2,771,510	1,515,148	158	130
Canadian Niagara Power Inc.	37,406	220,858	141,530	15	13
Centre Wellington Hydro Ltd.	117,589	716,512	439,976	43	34
Chapleau PUC	91,919	476,075	321,315	33	16
Chatham-Kent Hydro Inc.	108,271	679,777	417,531	45	39
COLLUS Power Corp.	161,529	819,383	564,184	61	32
E.L.K. Energy Inc.	186,977	975,339	667,758	74	44
Enersource Hydro Mississauga Inc.	8,483,296	52,716,169	32,309,607	3359	2887

Continued...



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LDC	Net Verified Energy Savings (Annual kWh)	Net Verified Energy Savings (Lifetime kWh)	Net Verified Energy Savings (Cumulative to 2014 kWh)	Net Verified Summer Demand Savings (Annual kW)	Net Verified Summer Demand Savings (Remaining in 2014 kW)
EnWin Utilities Ltd.	1,713,038	8,786,544	5,998,804	662	357
Erie Thames Powerlines Corporation	202,377	1,215,691	748,709	75	55
Essex Powerlines Corporation	139,935	784,660	507,722	52	36
Festival Hydro Inc.	335,087	2,343,073	1,264,349	128	101
Goderich Hydro	42,683	265,643	161,267	17	13
Greater Sudbury Hydro Inc.	207,531	1,566,212	797,807	82	70
Grimsby Power Incorporated	79,312	486,302	298,291	32	25
Guelph Hydro Electric Systems Inc.	778,995	5,438,202	2,939,918	313	257
Haldimand County Hydro Inc.	156,830	928,750	586,862	61	47
Halton Hills Hydro Inc.	97,298	557,221	358,387	42	31
Hearst Power Distribution Company Ltd.	100,177	626,375	390,623	41	37
Horizon Utilities Corporation	1,693,346	10,805,398	6,364,007	661	544
Hydro Hawkesbury Inc.	149,570	1,024,057	545,851	59	40
Hydro One Networks Inc.	13,630,141	80,832,814	49,125,164	5296	3361
Hydro Ottawa Limited	3,870,853	19,953,985	13,610,956	1416	794
Innisfil Hydro Distribution Systems Limited	35,938	190,735	125,326	14	8
Kenora Hydro Electric Corporation Ltd.	4,252	28,684	17,008	2	2
Kingston Hydro Corporation	264,376	1,775,472	999,753	105	85
Kitchener-Wilmot Hydro Inc.	631,336	4,371,618	2,373,597	261	211
Lakefront Utilities Inc.	308,217	1,782,733	1,133,952	116	82
Lakeland Power Distribution Ltd.	142,766	921,389	558,989	57	53
London Hydro Inc.	145,929	986,385	571,271	56	52
Middlesex Power Distribution Corporation	35,792	186,153	129,029	13	9
Midland Power Utility Corporation	244,291	1,474,013	917,147	93	73

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LDC	Net Verified Energy Savings (Annual kWh)	Net Verified Energy Savings (Lifetime kWh)	Net Verified Energy Savings (Cumulative to 2014 kWh)	Net Verified Summer Demand Savings (Annual kW)	Net Verified Summer Demand Savings (Remaining in 2014 kW)
Milton Hydro Distribution Inc.	25,882	239,826	103,530	10	10
Newmarket - Tay Power Distribution Ltd.	411,964	2,651,066	1,519,296	149	118
Niagara Peninsula Energy Inc.	903,623	4,990,903	3,151,364	333	197
Niagara-on-the-Lake Hydro Inc.	451,696	2,746,895	1,587,879	171	102
Norfolk Power Distribution Inc.	302,840	1,679,966	1,114,701	114	80
North Bay Hydro Distribution Limited	541,233	3,307,246	2,045,246	207	168
Northern Ontario Wires Inc.	121,356	671,073	435,461	47	30
Oakville Hydro Electricity Distribution Inc.	564,846	4,396,000	2,172,383	220	192
Orangeville Hydro Limited	55,853	357,175	211,368	22	18
Orillia Power Distribution Corporation	377,754	2,091,706	1,362,757	139	87
Ottawa River Power Corporation	283,517	1,590,720	1,028,866	110	75
Parry Sound Power Corporation	85,801	441,588	302,572	31	18
Peterborough Distribution Incorporated	91,318	604,688	337,617	41	30
PowerStream Inc.	5,296,278	30,381,182	19,296,686	2106	1531
PUC Distribution Inc.	576,898	3,672,499	2,190,934	227	189
Renfrew Hydro Inc.	38,086	277,888	152,345	14	14
Rideau St. Lawrence Distribution Inc.	267,169	1,459,276	983,797	106	75
Sioux Lookout Hydro Inc.	5,986	41,485	23,945	2	2
St. Thomas Energy Inc.	161,971	795,516	567,949	61	33
Thunder Bay Hydro Electricity Distribution Inc.	295,711	1,631,945	1,058,072	119	68
Tillsonburg Hydro Inc.	38,412	263,575	149,236	14	13

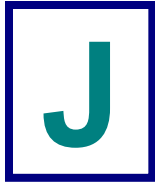
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LDC	Net Verified Energy Savings (Annual kWh)	Net Verified Energy Savings (Lifetime kWh)	Net Verified Energy Savings (Cumulative to 2014 kWh)	Net Verified Summer Demand Savings (Annual kW)	Net Verified Summer Demand Savings (Remaining in 2014 kW)
Toronto Hydro-Electric System Limited	12,683,558	68,000,356	44,087,503	4903	3048
Veridian Connections Inc.	212,590	1,090,082	730,430	85	47
Wasaga Distribution Inc.	51,687	253,548	177,595	18	8
Waterloo North Hydro Inc.	617,168	3,916,999	2,257,745	248	176
Welland Hydro-Electric System Corp.	285,191	1,814,531	1,008,692	109	67
Wellington North Power Inc.	74,943	413,584	276,565	29	21
Westario Power Inc.	500,486	3,394,551	1,910,976	193	162
Whitby Hydro Electric Corporation	43,922	294,416	162,643	22	18
Woodstock Hydro Services Inc.	163,837	988,177	616,847	65	50





# CONFIDENCE AND PRECISION

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## IMPACT EVALUATION SAMPLE DEVELOPMENT

To begin sample development, the Evaluation team first calculated an overall sample size for the program based on an overall confidence/precision target of 90/10.

LDCs were given until June 13th, 2012 to finalize their projects for the 2011 program year. Hence, the Evaluation Team used forecasts of participation provided by the OPA to determine initial sample sizes.

To calculate overall sample size, the following formula was used assuming a population of infinite size:

$$n_o = \left( \frac{Er * Z}{P} \right)^2$$

where:

- $Er$  = Overall population error ratio = 0.5 (assumed)
- $Z$  = Z-Statistic based on 90% confidence = 1.645
- $P$  = Precision from targets described above (5% or 10%)

This resulted in a required samples size of 68 to reach to targeted confidence and precision levels for the SBL Program. Details about distribution of site visits among the three strata can be found in the body of the report.

## CALCULATION OF REALIZATION RATES AND CONFIDENCE/PRECISION ACHIEVED

Savings estimated from M&V activities were aggregated at the strata level and compared to reported savings from project documentation to determine a strata realization rate. For strata where a sample was taken, this realization rate was then used to calculate an overall stratum verified savings estimate by multiplying it against total reported savings.

The stratum realization rate is calculated as:

$$b_h = \frac{\sum_{i=1}^{n_h} y_i}{\sum_{i=1}^{n_h} x_i}$$



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where:

- $b_h$  = realization rate for stratum  $h$
- $n_h$  = number of projects in stratum  $h$  sample
- $y_i$  = verified savings of project  $i$
- $x_i$  = reported savings of project  $i$

Thus, the overall stratum savings are calculated as:

$$Savings_{ver,h} = Savings_{rep,h} * b_h$$

where:

- $Savings_{ver,h}$  = total verified gross savings for stratum  $h$
- $Savings_{rep,h}$  = total reported gross savings for stratum  $h$

Total initiative savings are calculated as the sum of all strata, or:

$$Savings_{ver,I} = \sum_h Savings_{ver,h}$$

where:

- $Savings_{ver,I}$  = total verified savings of the initiative

Uncertainty in the verified savings estimates is a function of the variability of the verified savings relative to the reported savings.

$$se(b) = \frac{\sqrt{\frac{\sum_{i=1}^n (y_i - bx_i)^2}{n(n-1)}}}{\frac{1}{n} \sum_{i=1}^n x_i} * \sqrt{1 - \frac{n}{N}}$$

where:

- $se(b)$  = standard error for the realization rate

$$P = \frac{Z * se(b)}{b}$$



where:

- $P$  = relative precision of the realization rate (this will be the same as the relative precision of verified savings estimate)
- $Z$  = Z-Statistic based on 90% confidence = 1.645

The results of this uncertainty analysis are presented in Table 53, below.

**Table 53: Impact Results and Relative Precision (at 90% confidence)**

Strata	Energy Realization Rate	Relative Precision	Summer Demand Realization Rate *	Relative Precision
Small	0.790	±18.4%	0.705	±15.8%
Medium	0.859	±12.8%	0.860	±14.6%
Large	0.916	±10.0%	1.17	±12.5%
<b>Total</b>	<b>0.895</b>	<b>±7.9%</b>	<b>.839</b>	<b>±10.3%</b>

\* Does not include interactive effects for lighting measures (the calculation of interactive effects used stipulated factors, which do not contribute to sampling uncertainty).

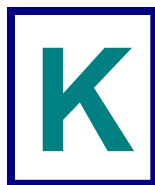
As shown in Table 53, the weighted average realization rates for the program have a higher level of precision than the individual strata. It was the decision of the Evaluation Team that the individual strata did not have high enough levels of precision to be used individually. Therefore, the realization rate was applied at the program level.





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## LDC STRATIFICATION LIST

Table 54 lists each of the LDCs that were listed in the 2010 Ontario Energy Board Yearbook of Electricity Providers along with the number of SBL eligible customers and the 2011 strata to which they were assigned. All LDCs listed in the yearbook were stratified even if they did not report SBL projects in 2011.

**Table 54: LDC Stratification List**

LDC	# of SBL Eligible Customers (2010) <sup>27</sup>	2011 SBL Stratification
Algoma Power	946	Small
Atikokan Hydro Inc.	232	Small
Bluewater Power Distribution Corporation	3,511	Medium
Brant County Power Inc.	1,337	Small
Brantford Power Inc.	2,735	Medium
Burlington Hydro Inc.	5,045	Medium
Cambridge and North Dumfries Hydro Inc.	4,627	Medium
Canadian Niagara Power Inc.	1,232	Small
Centre Wellington Hydro Ltd.	709	Small
Chapleau PUC	160	Small
Chatham-Kent Hydro Inc.	3,118	Medium
Clinton Power Corporation	217	Small
COLLUS Power Corp.	1,687	Small
Cooperative Hydro Embrun Inc.	170	Small
E.L.K. Energy Inc.	1,187	Small
Eastern Ontario Power Inc.	438	Small
Enersource Hydro Mississauga Inc.	17,197	Large
EnWin Utilities Ltd.	6,955	Medium
Erie Thames Powerlines Corporation	1,378	Small
Espanola Regional Hydro Distribution Corporation	425	Small

Continued...

<sup>27</sup> Data was taken from the 2010 update of the published by the Ontario Energy Board Yearbook of Electricity Producers dated August 29<sup>th</sup>, 2011.  
<http://www.ontarioenergyboard.ca/OEB/Industry/Rules+and+Requirements/Reporting+and+Record+Keeping+Requirements/Yearbook+of+Distributors>



LDC	# of SBL Eligible Customers (2010) <sup>27</sup>	2011 SBL Stratification
Essex Powerlines Corporation	2,046	Small
Festival Hydro Inc.	1,985	Small
Fort Frances Power Corporation	419	Small
Goderich Hydro	483	Small
Greater Sudbury Hydro Inc.	4,118	Medium
Grimsby Power Incorporated	662	Small
Guelph Hydro Electric Systems Inc.	3,647	Medium
Haldimand County Hydro Inc.	2,369	Small
Halton Hills Hydro Inc.	1,655	Small
Hearst Power Distribution Company Ltd.	401	Small
Horizon Utilities Corporation	18,053	Large
Hydro 2000 Inc.	143	Small
Hydro Hawkesbury Inc.	593	Small
Hydro One Brampton Networks Inc.	7,975	Medium
Hydro One Networks Inc.	101,638	Large
Hydro Ottawa Limited	23,548	Large
Innisfil Hydro Distribution Systems Limited	892	Small
Kenora Hydro Electric Corporation Ltd.	741	Small
Kingston Hydro Corporation	3,264	Medium
Kitchener-Wilmot Hydro Inc.	7,493	Medium
Lakefront Utilities Inc.	1,069	Small
Lakeland Power Distribution Ltd.	1,556	Small
London Hydro Inc.	11,897	Large
Middlesex Power Distribution Corporation	779	Small
Midland Power Utility Corporation	738	Small
Milton Hydro Distribution Inc.	2,283	Small
Newmarket - Tay Power Distribution Ltd.	2,973	Medium
Niagara Peninsula Energy Inc.	4,357	Medium
Niagara-on-the-Lake Hydro Inc.	1,224	Small
Norfolk Power Distribution Inc.	2,009	Small
North Bay Hydro Distribution Limited	2,636	Medium
Northern Ontario Wires Inc.	755	Small

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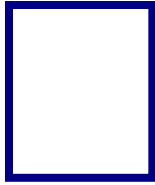
LDC	# of SBL Eligible Customers (2010) <sup>27</sup>	2011 SBL Stratification
Oakville Hydro Electricity Distribution Inc.	4,886	Medium
Orangeville Hydro Limited	1,163	Small
Orillia Power Distribution Corporation	1,344	Small
Oshawa PUC Networks Inc.	3,795	Medium
Ottawa River Power Corporation	1,372	Small
Parry Sound Power Corporation	538	Small
Peterborough Distribution Incorporated	3,588	Medium
Port Colborne Hydro Inc.	937	Small
PowerStream Inc.	30,076	Large
PUC Distribution Inc.	3,349	Medium
Renfrew Hydro Inc.	442	Small
Rideau St. Lawrence Distribution Inc.	770	Small
Sioux Lookout Hydro Inc.	394	Small
St. Thomas Energy Inc.	1,687	Small
Thunder Bay Hydro Electricity Distribution Inc.	4,415	Medium
Tillsonburg Hydro Inc.	658	Small
Toronto Hydro-Electric System Limited	66,167	Large
Veridian Connections Inc.	8,578	Medium
Wasaga Distribution Inc.	777	Small
Waterloo North Hydro Inc.	5,385	Medium
Welland Hydro-Electric System Corp.	1,692	Small
Wellington North Power Inc.	473	Small
West Perth Power Inc.	235	Small
Westario Power Inc.	2,429	Small
Whitby Hydro Electric Corporation	1,967	Small
Woodstock Hydro Services Inc.	1,170	Small





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# SURVEY INSTRUMENTS

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## 2011 NTG ON-SITE SURVEY INSTRUMENT

Q1. Had you ever considered replacing your (lights, other measures auto filled) before you were contacted by the Small Business Lighting program representative?

- Yes (1)
- No (2)
- Don't know (3)
- Refused (4)

If No Is Selected, Then Skip To Since installing new equipment through...

Q2. Had you planned to replace your (lights, ballasts, other measures auto filled) before you were contacted by the program representative? By planned I mean you had collected information, selected equipment, contacted a contractor, or otherwise begun the process of replacement.

- Yes (1)
- No (2)
- Don't know (3)
- Refused (4)

If No Is Selected, Then Skip To I'd also like to ask you about other ...

Q3. Imagine you had not been offered a free audit and installation of equipment... Which of the following options best describes what your business would have done in 2011? [Interviewers: Please READ all but "don't know." It's not unusual for respondents to interrupt the list and explain what they think they would have done. Probe to code if necessary.]

- Would not have done the project at all in 2011. (1)
- Would have installed equipment that was less expensive or less energy efficient. (2)
- Would have installed the same equipment and paid the full cost yourself (3)
- Don't know (4)



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If Would have installed the sa... Is Not Selected, Then Skip To I'd also like to ask you about other ...

Q4. Just to confirm, you would have done the exact same project- and paid for it yourself- even if you had no received and equipment for free?

- Yes (1)
- No (2)

Q5. I'd also like to ask you about other influences on your decision to do the Small Business Lighting project the way you did it. On a scale of 1 to 5, with "1" indicating "did not have any influence on my project" and "5" indicating "had a great influence my project," how influential was...? ]

1 (1) 2 (2) 3 (3) 4 (4) 5 (5) Don't know/No Opinion (6)

The amount of the program incentive (1)

The fact that free equipment was available (2)

The results of the Assessment (3)

Your interaction with the Assessor or contractor (4)

Q7. Since installing new equipment through this program, have you purchased or installed any other new energy-using equipment?

- Yes (1)
- No (2)
- Refused (4)

If Yes Is Not Selected, Then Skip To Thinking of your experience with the ...

Q8. What did you install?

Q9. Auditor note: if contact reports installing new equipment here, please refer to your paper survey/data collection form.

Q10. On a scale of 1 to 5, where "1" means "this did not have any influence on my project" and "4" means "had a great influence my project," how influential was:

1 (1) 2 (2) 3 (3) 4 (4) 5 (5) Don't know/no opinion (6)



Your experience with the energy efficient lighting installed through SBL (1)

Your experience with the Small Business Lighting Program in your decision to install this new equipment. (2)

Q11. Did your Small Business Lighting assessor or contractor recommend this project?

- Yes (1)
- No (2)
- Don't know (3)

Q12. I have a few questions about your experience with the Small Business Lighting Program. I'm going to list several elements. For each one, please indicate your satisfaction with the program, where 1 is "not at all satisfied" and 5 is "very satisfied". If you have no opinion on that aspect, please circle "no opinion"

1 (1) 2 (2) 3 (3) 4 (4) 5 (5) Don't know/No opinion (6)

Performance of equipment installed (1)

Co-pay required (2)

Paperwork or application documents (3)

Interaction with program contact (4)

Clarity of assessment information (5)

Quality of installation work (6)

Overall program experience (7)

Q22. QUESTIONS FOR AUDITOR: Did this facility already replace all of their lights (leaving no T-12s)?

- Yes, there are no remaining T12s (1)
- There may still be some T12s (2)



- Don't know (3)

If Yes, there are no remaining... Is Selected, Then Skip To Where do you usually get information

Q14. Before today, were you aware of these lighting standards that will result in phasing out less efficient lighting, such as T-12s and incandescent light bulbs?

- Yes (1)  
 No (2)  
 Don't know (3)  
 Refused (4)

Q15. Since some of the T-12s cannot be manufactured any more, we'd like to ask about T-12s at your facility. Do you have any T-12 lamps installed now?

- Yes (1)  
 No (2)  
 Don't know (3)  
 Refused (4)

If No Is Selected, Then Skip To Where do you usually get information ...

Q16. Do these T-12 lamps have magnetic or electronic ballasts?

- Magnetic (1)  
 Electronic (2)  
 Both (some of each) (3)  
 Don't know (4)  
 Refused (5)

Q17. What percent of all linear fluorescent lighting in your facility is currently T-12s?

Q18. Do you have any T-12 lamps in storage to replace the installed T-12s when they burn out?

- Yes (1)  
 No (2)  
 Don't know (4)



If No Is Selected, Then Skip To Where do you usually get information ...

Q19. What percent of the T-12s currently installed could be replaced by the T-12s in storage? [IF NEEDED: That is, do you have enough in storage to replace all your T-12s installed now? More than 1-1 replacement? Less? About what %?]

Q20. Where do you usually get information about lighting technologies that could save energy and money for your business? [DO NOT READ; MARK ALL MENTIONED]

- Utility (1)
- Lighting contractor (2)
- Internet (3)
- Architect or designer] (4)
- Trade journals (5)
- Other: (6) \_\_\_\_\_
- Don't know (7)
- Refused (8)

Q21. What are most important factors that you consider when purchasing lighting? [DO NOT READ; MARK ALL MENTIONED]

- Total project cost (1)
- Return on investment (2)
- Available financing (3)
- Energy efficiency (4)
- Energy savings pay for the project/investment (5)
- Utility, state, or federal rebates and incentives will pay for the cost (6)
- Light quality (7)
- Product availability (8)
- Other: (9)
- Don't know (10)
- Refused (11)

Q13. Thanks for answering the questions. Any last comments? [Press next to submit]





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research/into/action<sup>inc</sup>



## 2011 SBL INSTALLERS AND ASSESSORS PROCESS SURVEY INSTRUMENT

- Q1. OPA Small Business Lighting INITIATIVE Interview guide: Assessors & Contractors  
Interviewee: \${m://FirstName}
- Q2. Hi my name is \_\_\_\_\_, and I'm calling from Research Into Action on behalf of the Ontario Power Authority as part of an evaluation of the Small Business Lighting program. According to our records you were involved with this program in 2011 as an assessor or installation contractor. We would appreciate hearing about your experiences with the program; understanding these experiences is important in helping to ensure the program continues to be successful in future years. My questions should take about 15 minutes. Is this a good time to talk? If not: schedule. If so: continue. Thank you. Before we begin, I want to assure you that your responses are confidential and that we do not report results in a way that the OPA or any participating LDC can identify contacts. Also, please answer based on your experiences with SBL from January to December, 2011 only.
- Q3. Did you work with the Small Business Lighting program, Power Savings Blitz, in 2010?
- Yes (1)
  - No (2)
  - Don't Know (3)
- Q4. Thinking about the 2011 program year, I'm going to list several roles you might have played in the Small Business Lighting program... for the 2011 SBL program did you identify potential participants?
- Yes (1)
  - No (2)
  - Don't Know (3)
  - Refused (4)

Answer If Thinking about the 2011 program year, I'm going to list ... Yes Is Selected

- Q5. How?
- Get a list of participants from someone [Who? ] (1) \_\_\_\_\_
  - LDC/Utility tells me where to go (2)
  - Referrals from existing customers (3)
  - Cold calls (4)



- With marketing materials you've developed (5)
- Other, specify: (6) \_\_\_\_\_

Answer If Thinking about the 2011 program year, I'm going to list ... Yes Is Selected

Q6. Optional: other comments

Answer If Did you work with the Small Business Lighting program, Po... Yes Is Selected And Thinking about the 2011 program year, I'm going to list ... Yes Is Selected

Q7. How, if at all, has identifying participants changed since 2010? (Probe: Is it easier? Harder? If harder: Why do you say that? Do you feel there is still opportunity left?)

Q8. In the 2011 SBL program, did you ...

Answer If In the 2011 SBL program, did you ... Conduct site assessments? - Yes Is Selected And In the 2011 SBL program, did you ... Install equipment? - Yes Is Selected

Q9. Would you say you primarily interact with the program as an Assessor, an Installer, or both roles equally?

- Primarily assessor (1)
- Primarily installer (2)
- Do both activities equally or nearly equally (3)

Answer If Would you say you primarily interact with the program as ... Primarily installer Is Selected

Q10. Who performs your assessments? (Do not read; check all that apply)

- I do (1)
- Someone else from my firm performs them (2)
- Someone from another firm performs them - [Probe: Who: How did you develop this relationship?] (3) \_\_\_\_\_
- Other: (4) \_\_\_\_\_

Q11. How many LDCs do you work with?

Q12. Program Involvement and Experience Great, thanks. Now I would like to ask about your experience with this initiative in Ontario:

Q13. How do the participants you interact with respond to the offer initially, do they seem to understand the offer or have any immediate questions?



Q14. Do they express any concerns about the program? (do not read list, check as many as apply)

- No/None (1)
- Concerns about the legitimacy of the program (2)
- Want to use their own contractor (3)
- The incentive will not allow full retrofit (the project will cost more than \$1,050) (4)
- Look of the equipment (5)
- Quality of the equipment (6)
- Tenancy - need to check with landlord or property manager (7)
- Longevity - plans for the business to move or close (8)
- Something else? (9) \_\_\_\_\_

Q15. What is the most common concern?

- No/None (1)
- Concerns about the legitimacy of the program (2)
- Want to use their own contractor (3)
- The incentive will not allow full retrofit (the project will cost more than \$1,050) (4)
- Look of the equipment (5)
- Quality of the equipment (6)
- Tenancy - need to check with landlord or property manager (7)
- Longevity - plans for the business to move or close (8)
- Something else? (9) \_\_\_\_\_

Q16. How do you address this?

Q17. Have you done projects in leased space?

- Yes (1)
- No (2)



- Don't Know (3)
- Refused (4)

Answer If Have you done projects in leased space? Yes Is Selected

Q18. Do you ever have to obtain approvals from property owners?

- Yes (1)
- No (2)
- Don't Know (3)

Answer If Do you ever have to obtain approvals from property owner... Yes Is Selected

Q19. How does this happen?

Q20. Have you done projects in bulk-metered buildings?

- Yes (1)
- No (2)
- Don't know (3)

Answer If Have you done projects in bulk-metered buildings? Yes Is Selected

Q21. How did you determine eligibility?

Q22. Additional Equipment Opportunities

Q23. How would you describe the equipment choices available for SBL projects: would you say you have...

- Limited choice or options? (1)
- Sufficient number of options. (2)
- A wide range of equipment options are available to you. (3)

Answer If How would you describe the equipment choices available f... Limited choice or options? Is Selected

Q24. In what way do you feel your lighting equipment choices are limited?

Q25. Are there lighting products that are not on the SBL schedule, but should be? What kinds? [Probe: For example, do you see opportunities for high-bay, LED PAR lamps, or metal halide replacement that you can't address through the program?]



Q26. What portion of your typical work week do you spend installing commercial lighting?  
[Probe for percent]

Q27. What portion of your typical work week would you say you spend on SBL projects?

Q28. Have you had any difficulties keeping up with SBL projects in queue?

Q29. Did the volume of SBL projects you had meet your expectations?

- Yes (1)
- No (2)
- Don't Know (3)

Answer If Did the volume of SBL projects you had meet your expectat... No Is Selected

Q30 In what way did it fail to meet your expectations?

Answer If Strata Is Equal to Large

Q31. Your firm did a substantial number of jobs with the program last year. How was your firm able to do this?

Q32. How do SBL projects differ from projects installed outside the program? ...Is the equipment more energy efficient?

- Yes (1)
- No (2)
- Don't Know (3)
- Refused (4)

Answer If How do SBL projects differ from projects installed outside... No Is Selected

Q33. Is it less efficient?

- Yes (1)
- No (2)
- Don't Know (3)
- Refused (4)

Q34. Is the equipment higher quality?

- Yes (1)



- No (2)
- Don't Know (3)
- Refused (4)

Answer If Is the equipment higher quality? No Is Selected

Q35. Is it lower quality?

- Yes (1)
- No (2)
- Don't Know (3)
- Refused (4)

Q36. Are the projects larger?

- Yes (1)
- No (2)
- Don't Know (3)
- Refused (4)

Q37. Are the businesses smaller?

- Yes (1)
- No (2)
- Don't Know (3)
- Refused (4)

Q38. Is there some other way these projects differ?

Q39a. Can you estimate the portion of your SBL jobs in which old or inefficient lighting was NOT replaced because the participant had hit the \$1,000 dollar cap?

Q39b. Are you aware that in 2011, small businesses participating in the Small Business Lighting program were also able to apply for Standard Incentives above the \$1000 cap?[If needed, to clarify:] In prior years, small business customers had to choose between direct install lighting and incentives available from other programs. Now, they can do both.

- Yes (1)
- No (2)



- Don't Know (3)
- Refused (4)

Answer If Are you aware that in 2011, small businesses participating... Yes Is Selected

Q40. How often do you suggest this to your customers?

- Never (1)
- Other: (2) \_\_\_\_\_

Answer If How often do you suggest this to your customers? Other: Is Selected

Q41. What is the most common type of equipment you identify in these situations?

Answer If How often do you suggest this to your customers? Other: Is Selected

Q42. On what portion of your program jobs have your customers elected to apply to the large business program for additional incentives?

Answer If Are you aware that in 2011, small businesses participating... Yes Is Selected

Q43. How has this opportunity affected your program work?

Q44. Does the Small Business Lighting program offer you any opportunities to identify efficiency upgrade opportunities other than lighting?

Q45. Communication with LDC and Implementation Contractors

Q46. Who is your primary contact for Small Business Lighting? Is it...

- An LDC staff person (1)
- An electrical contractor or lighting firm working on the program (2)
- Someone at an implementation firm (such as Nedco, Sonepar, Energy Shop, Burman Energy): Which ones? (3) \_\_\_\_\_

Answer If Who is your primary contact for Small Business Lighting? ... An LDC staff person Is Not Selected

Q47. Do you ever interact directly with the local utilities about the program?

- Yes (1)
- No (2)
- Don't Know (3)
- Refused (4)



Answer If Do you ever interact directly with the local utilities a... Yes Is Selected Or Who is your primary contact for Small Business Lighting? ... An LDC staff person Is Selected

Q48. How often do you typically interact?

- Daily (1)
- Weekly (2)
- Monthly (3)
- Less often (4)
- Varies (5)
- Other (6) \_\_\_\_\_
- Don't know (7)

Answer If Do you ever interact directly with the local utilities a... Yes Is Selected Or Who is your primary contact for Small Business Lighting? ... An LDC staff person Is Selected

Q49. How do you typically communicate with local utilities about SBL?

- Email (1)
- Phone (2)
- In person (3)

Answer If Do you ever interact directly with the local utilities a... Yes Is Selected Or Who is your primary contact for Small Business Lighting? ... An LDC staff person Is Selected

Q50. And what is the most common reason you communicate with the LDC (\$e://Field/PrimeLDC) directly?

- Questions about eligibility (1)
- Payments and invoices (2)
- Equipment substitutions (3)
- Scheduling (4)
- Something else? (5) \_\_\_\_\_

Q51. Do you upload information into the database yourself?

- Yes (1)
- No (2)





- Don't Know (3)
- Refused (4)

Answer If Do you upload information into the database yourself? No Is Selected

Q52. Who does this for you?

Answer If Do you upload information into the database yourself? Yes Is Selected

Q53. How does this work: What is involved in doing this?

Answer If Do you upload information into the database yourself? Yes Is Selected

Q54. How long does it usually take per project?

Q55. Satisfaction

Q56. Please rate your agreement with the following statements from 1, strongly disagree, to 5, strongly agree:

Answer If Please rate your agreement with the following statements... - 1 Strongly disagree Is Selected Or Please rate your agreement with the following statements... - 2 Is Selected

Q57 You indicated some disagreement. Could you explain what could be improved?

Q58. Overall, do you have any suggestions to improve the program?

Q59. Firm Demographics and Details I'd like to learn a little bit more about your company

Q60. How would you categorize the primary contracting expertise of your company: is your organization....?

- Lighting (1)
- Lighting and mechanical (2)
- Mechanical contracting (3)
- General contractor or builder (4)
- Something else, specify: (5) \_\_\_\_\_

Q61. Do you ever recommend or install...

- HVAC equipment (1)
- Refrigeration (2)



- Cooking equipment (3)
- Rooftop ACs (4)
- Energy management systems and controls (5)
- Lighting controls (6)
- Advanced lighting solutions (calculations that include daylighting, demand response opportunities, occupancy or photocell controls) (7)

Q62. I will read 3 statements. Please tell me which one best matches your opinion.

- Current economic conditions are favorable for my company's growth and profitability. (1)
- Current economic conditions are neutral for my company's growth and profitability. (2)
- Current economic conditions are likely to restrict my company's growth and profitability. (3)

Q63. Job Creation

Q64. How many employees does your company have in Ontario?

Q65. Have you added any staff since January, 2011 because of your engagement with SBL?

- Yes (1)
- No (2)
- Don't Know (3)
- Refused (4)

Answer If Have you added any staff since January, 2011 because of y... Yes Is Selected

Q66. How many?

\_\_\_\_\_ Full-time [optional comment:] (1)

\_\_\_\_\_ Part Time (2)

Answer If Have you added any staff since January, 2011 because of y... Yes Is Selected

Q66b. Just to confirm, if you had NOT done any work with SBL in 2011, you would not have hired those [X] people.

- Correct (1)



Incorrect, correct below: (2) \_\_\_\_\_

Q67. Have you avoided reducing staff or layoffs in 2011 because of your engagement with SBL?

Yes (1)

No (2)

Don't Know (3)

Refused (4)

Answer If Have you avoided reducing staff or layoffs in 2011 because... Yes Is Selected

Q68. How many?

\_\_\_\_\_ Full-time (1)

\_\_\_\_\_ Part time (optional comment:) (2)

Answer If Have you avoided reducing staff or layoffs in 2011 because... Yes Is Selected

Q68B. Just to confirm, if you had NOT done any work with SBL in 2011, you would have laid off [X] people.

Correct (1)

Incorrect, correct below: (2) \_\_\_\_\_

Q69. I want to confirm that you are aware that beginning in July 2012, T12s will no longer be manufactured.

Aware (1)

Not aware (2)

Don't Know (3)

If Aware Is Not Selected, Then Skip To How do SBL jobs compare to your other...

Q70. How, if at all, has this phase-out affected your lighting retrofits this year?

Q71. How do you think this phase-out might affect the market? [Probe as needed:]

Q72. How do SBL jobs compare to your other work in terms of profitability?

Much more profitable (1)

Somewhat more profitable (2)



- About the same (3)
- Somewhat less profitable (4)
- Much less profitable (5)
- Not at all profitable (6)
- Don't Know (7)
- Refused (8)

Answer If How do SBL jobs compare to your other work in terms of pr... Much more profitable Is Selected Or How do SBL jobs compare to your other work in terms of pr... Somewhat more profitable Is Selected

Q73. In what way?

Answer If How do SBL jobs compare to your other work in terms of pr... Not at all profitable Is Selected Or How do SBL jobs compare to your other work in terms of pr... Much less profitable Is Selected Or How do SBL jobs compare to your other work in terms of pr... Somewhat less profitable Is Selected

Q74. In what way?

Answer If Did you work with the Small Business Lighting program, Po... Yes Is Selected

Q75. Has the profitability of participating changed over the past two years? If yes: how?

Q76. How has the rise in fluorescent lighting prices affected your business or your involvement with the program?

Q77. Are there other cost considerations associated with your participation with SBL?[For example, have you had to purchase scissor lifts, ladders, and additional lamp and ballast stock? What about roll rates for trucks?]

Q78. [Open Comments Box]

Q79. Those are all my questions today, thank you again for your time!



**2011 SBL PARTICIPANT PROCESS SURVEY INSTRUMENT**

SCR1. Hi, my name is \_\_\_\_\_, I'm calling from Harris Decima on behalf of the Ontario Power Authority. Could I please speak with [INSERT "CONTACT PERSON" FROM SAMPLE]?

- 1 Yes, speaking GO TO SCR2A
- 2 Yes, transfers GO TO SCR2B
- 3 Not available SCHEDULE CALLBACK
- 4 Don't know THANK & TERMINATE

SCR2A. I'd like to talk to you about your experience with [INSERT "LDC NAME" FROM SAMPLE]'s saveONenergy Small Business Lighting program. This was the program that installed lighting equipment, and possibly hot water or other equipment in your business on or around [INSERT "RETROFIT DATE" FROM SAMPLE]. Do you recall receiving this equipment?

- 1 Yes, continue GO TO SCR3
- 2 Not the right person ASK TO BE TRANSFERRED, GO TO SCR2B
- 3 Not available SCHEDULE CALLBACK
- 4 Don't know/Refused THANK & TERMINATE

SCR2B. Hi, my name is \_\_\_\_\_, I'm calling from Harris Decima on behalf of the Ontario Power Authority. I'd like to talk to you about your experience with [INSERT "LDC NAME" FROM SAMPLE]'s saveONenergy Small Business Lighting program. This was the program that installed lighting equipment, and possibly hot water or other equipment in your business on or around [INSERT "RETROFIT DATE" FROM SAMPLE]. Do you recall receiving this equipment?

- 1 Yes, continue GO TO SCR3
- 2 Not the right person ASK TO BE TRANSFERRED, REREAD SCR2B
- 3 Not available SCHEDULE CALLBACK
- 4 Don't know/Refused THANK & TERMINATE

SCR3. I just have a few questions about your experience with this program. Is now a good time?

SCREENER NOTES:



[If asked for more explanation:] We're looking to hear about your experiences with the program. Understanding these experiences is important in helping to ensure the program continues to be successful in future years. Your participation would be greatly appreciated.

[If necessary:] The survey will take no longer than 10 minutes of your time.

[If necessary:] Please be assured that your individual responses will remain confidential. Data will be reported in aggregate form only.

### Section A: Awareness

1. How did you first hear of the opportunity to obtain new lighting or hot water heating equipment with assistance from [INSERT "LDC NAME" FROM SAMPLE]? Did you first hear about it from:

[READ LIST]

1. A lighting contractor,
  2. [INSERT "LDC NAME" FROM SAMPLE] – Direct Mail
  3. [INSERT "LDC NAME" FROM SAMPLE] – Phone call
  4. [INSERT "LDC NAME" FROM SAMPLE] – General
  5. A friend or colleague,
  6. An auditor or assessor,
  7. Or some other way? (Please specify):
  99. [DO NOT READ] Don't know/Refused
2. Had you considered purchasing this equipment prior to hearing about the Small Business Lighting program?
    1. Yes
    2. No
    99. Don't know/Refused
  3. What made you decide to participate in the Small Business Lighting program?

[DO NOT READ. PROBE TO CODE IF NECESSARY. SELECT ALL THAT APPLY.]

1. Saving money on energy bills
2. Conserving energy / protecting the environment



3. Getting free equipment [up to \$1000]
  4. No cost to participate
  5. Replacing broken equipment
  6. Acquiring the latest equipment
  7. Seeking improved lighting (quality)
  8. Participation was easy
  9. Other (please specify): \_\_\_\_\_
  99. Don't know/Refused
4. Now I'd like to discuss how you decided which equipment to replace.
- When the assessor or auditor visited your business location, what types of upgrades or changes did you discuss with them? [Probe if necessary: Did you discuss anything else with them?]

[DO NOT READ. PROBE TO CODE IF NECESSARY. SELECT ALL THAT APPLY.]

1. Number of lights/fixtures to be replaced
  2. Type of lights/fixtures to be replaced
  3. Energy savings resulting from the upgrades/changes
  4. How to stay below the \$1000 incentive cap
  5. Prioritizing projects
  6. Cost
  7. Quality of lights/fixtures
  8. Other (Please specify:) \_\_\_\_\_
  99. Don't know/Refused
5. Did the assessor or auditor recommend or suggest any other upgrades or equipment change-outs at your site beyond what could be completed within the \$1000 incentive amount?
1. Yes
  2. No
  99. Don't know/Refused



6. [If Q5=Yes:] What other opportunities were identified?  
[Open-ended response]  
99. Don't know/Refused
7. [If Q5=Yes] Did your assessor or auditor mention that additional incentives were available for equipment costs above the \$1,000 program incentive cap?
1. Yes
  2. No
99. Don't know/Refused
8. Did your project exceed the \$1,000 cap?
1. Yes
  2. No
99. Don't know/Refused
9. And did you have any other business facility upgrade projects in mind? In other words, anything else you were thinking about doing that was not performed during this project?
1. Yes
  2. No
99. Don't know/Refused
- Q9a. [IF Q9=YES] What were you considering?  
[Open-ended response]  
99. Don't know/Refused
- Q9b. [IF Q9=YES] And why did you decide to drop these plans?
1. Too expensive
  2. No rebates available
  3. No time
  4. Landlord/property manager approval required
  5. Changed my mind
  6. Other [please specify]





99. Don't know/Refused

### Section B: Satisfaction

10. I'm now going to list several aspects of the Small Business Lighting initiative. For each aspect, please tell me if you are not at all satisfied, a little satisfied, somewhat satisfied, very satisfied, or extremely satisfied. If you have no opinion you can also say that.

How would you rate...?

[RANDOMIZE LIST]

1. Not at all satisfied
  2. A little satisfied
  3. Somewhat satisfied
  4. Very satisfied
  5. Extremely satisfied
- a) The performance of the new equipment that was installed\*
 

1	2	3	4	5	No Opinion
---	---	---	---	---	------------
  - b) The amount you paid out of pocket
 

1	2	3	4	5	No Opinion
---	---	---	---	---	------------
  - c) The energy savings your business has experienced since the equipment was installed
 

1	2	3	4	5	No Opinion
---	---	---	---	---	------------
  - d) The ease of the paperwork or application
 

1	2	3	4	5	No Opinion
---	---	---	---	---	------------
  - e) Your interaction with program contacts
 

1	2	3	4	5	No Opinion
---	---	---	---	---	------------
  - f) Clarity of information provided by your assessor
 

1	2	3	4	5	No Opinion
---	---	---	---	---	------------
  - g) The quality of the installation work\*
 

1	2	3	4	5	No Opinion
---	---	---	---	---	------------



- h) Your overall experience with the program [ANCHOR LAST]
- 1      2      3      4      5      No Opinion
11. [IF 10a = 1 or 2] You mentioned that you are [if 10a = 1 then “not at all satisfied”, if = 2 “a little satisfied”] with the performance of the equipment that was installed. Could you please describe why you are dissatisfied?
- [Open-ended response]
99. Don't know/Refused
12. [IF 10g = 1 or 2] You mentioned that you are [if 10g = 1 then “not at all satisfied”, if = 2 “a little satisfied”] with the quality of the installation work. Could you please describe why you are dissatisfied?
- [Open-ended response]
99. Don't know/Refused

### Section C: Future Upgrades

13. I now have a few questions about projects you might be considering at your facility in the future....
- Did you replace all of the lights at this business location through the Small Business Lighting program?
1. Yes [SKIP TO QUESTION 18]
2. No
99. Don't Know/refused
14. [If 13 = No] About what percent of lights at your business location were replaced?
- [Open-ended numeric response] [If 100%, recode Q13=YES]
99. Don't know/Refused
15. [If 13 = No AND Q14 <100%] What type(s) of lights were NOT replaced?
- [INTERVIEWER NOTE: If necessary, ask to describe the fixtures that remained, e.g. How old are they? What do they look like?]
- [Open-ended response]
99. Don't know/Refused



16. [If 13 = No AND Q14 <100%] Are you considering replacing the remaining lights at your business location?
1. Yes
  2. No
  3. Maybe
  99. Don't Know/Refused
17. [If 16=No] Why aren't you considering replacing the remaining lights?  
[Open-ended response]
99. Don't know/Refused
18. Would you contact your utility if you were considering replacing lighting equipment in the future?
1. Yes
  2. No
  3. Already have contacted
  99. Don't know/Refused
19. Were you aware of other energy efficiency program opportunities before learning about the Small Business Lighting initiative?
1. Yes
  2. No
  99. Don't know/Refused
20. [IF Q19=YES] How have you typically learned about energy efficiency program opportunities in the past? [DO NOT READ, SELECT ALL THAT APPLY]
1. Email
  2. Brochure
  3. From a vendor, distributor, or contractor
  4. Included with my utility bill
  5. Phone call
  6. Media (such as ads on radio or TV or local billboards)



7. Web search
  98. Other (please specify)
  99. Don't know/Refused
21. In general, how would you prefer to learn about energy efficiency program opportunities?

[DO NOT READ. SINGLE RESPONSE OPTION]

1. Email
  2. Brochure
  3. From a sales person, distributor, or contractor
  4. Included with my utility bill
  5. Phone call
  6. Media (such as ads on radio or TV or local billboards)
  7. Web search
  98. Other (please specify)
  99. Don't know/Refused
22. Where do you usually get information about lighting technologies that could save energy and money for your business? [DO NOT READ; SELECT ALL THAT APPLY]
1. Utility
  2. Lighting contractor
  3. Internet
  4. Architect or designer
  5. Trade journals
  98. Other (please specify)
  99. Don't know/Refused
23. What are most important factors that you consider when purchasing lighting for your business location? Anything else?

[DO NOT READ; SELECT ALL THAT APPLY]

1. Cost of lighting fixtures



2. Return on investment
  3. Available financing
  4. Energy efficiency
  5. Energy savings pay for the project/investment
  6. Utility, provincial, or federal rebates and incentives will pay for the cost
  7. Light quality
  8. Product availability
  98. Other (please specify)
  99. Don't know/Refused
24. I'm now going to list several financial and product considerations that might affect the equipment your organization chooses to purchase at its facility. For each, please tell me if each aspect is very important, important, somewhat important, not very important or not at all important when making business equipment purchase decisions.

[Programmer Note: Randomize, but keep the two consideration categories separate. Read Category 1 first, followed by Category 2.]

Category 1: Financial Considerations

- a) The initial cost of the equipment
- b) The payback period
- c) Lifetime rate of return

Category 2: Product Considerations

- a) The equipment's effect on greenhouse gases
  - b) A recommendation by a vendor or contractor you trust
  - c) Purchasing a familiar brand
  - d) Having an Energy Star or other environmental label
  - e) A robust warranty
  - f) Overall speed associated with the purchase: How quickly can it be on-site?
1. Not at all important
  2. Not very important



3. Somewhat important
  4. Important
  5. Very important
25. For the next set of questions I will read a list of equipment and fixtures. Please indicate if they are currently present at your business location..
- [READ LIST] [Multi-mention response] [RANDOMIZE LIST]
- A Heating equipment (e.g., Furnace for space heating)
  - B Cooling equipment (e.g., air conditioner for space cooling)
  - C Gas water heating
  - D Electric water heating
  - E An energy management system or other controls such as occupancy sensors
  - F Computer and office equipment (more than one computer)
  - G Commercial cooking equipment
  - H Refrigerator
  - I Freezer
  - J Ventilation fans
  - K Air compressor
  - L Cooking ovens
26. Have you heard about pending changes to lighting regulations that will result in phasing out less efficient lighting equipment including T-12 lamps and some incandescents?
1. Yes
  2. No
  99. Don't Know/refused

### Section D: Firmographics

PRE. I have just a few final questions about your business. Please be assured that your responses are confidential and will be summarized and reported in aggregate form only. Again, please base all of your answers on the main business location where the upgrade took place.



27. Which of the following best characterizes your business? [READ LIST, STOP WHEN APPLICABLE OPTION HAS BEEN REACHED. SINGLE RESPONSE OPTION]
1. Retail
  2. Personal services (spas, gyms, salons)
  3. Food service
  4. General office
  5. Small Grocery (convenience store, liquor store)
  6. Religious services
  7. Medical or Dental (including mental health)
  8. Veterinary
  9. Laundry
  10. Property management
  98. Other (please specify)
  99. Don't know/Refused
28. Is there specialized energy-using equipment common in your field of business that OPA should consider including in programs designed to serve businesses like yours?
- [Open-ended response]
99. Don't know/Refused
29. Does your organization...? [READ LIST, STOP WHEN APPLICABLE OPTION HAS BEEN REACHED. SINGLE RESPONSE OPTION]
1. Own and occupy the entire building
  2. Own the building and occupy part of it while leasing parts to others
  3. Lease the space
  4. Own the building and lease out the entire space
  99. Don't know/Refused
30. What is the approximate square footage of the business location where you work?
- [Open-ended box – for max 6 digits (e.g. 100,000 sq ft)]



31. On a scale from 1 to 5, where 5 is highly favorable and 1 is highly unfavorable, how would you describe the current overall outlook for your business?
1. Highly unfavorable
  2. Somewhat unfavorable
  3. Neither favorable nor unfavorable
  4. Somewhat favorable
  5. Highly favorable
99. Don't know/Refused
32. [If Q31=1,2 or 3] What would you say is your business' current primary concern?  
[Open-ended response]
99. Don't know/Refused
33. In which of the following areas is your business located? [READ LIST, STOP WHEN APPLICABLE OPTION HAS BEEN REACHED. SINGLE RESPONSE OPTION]
- 1 Toronto
  - 2 Markham/ Vaughan/ Richmond Hill
  - 3 Other York
  - 4 Mississauga
  - 5 Other Peel
  - 6 Halton
  - 7 Pickering/Ajax/Uxbridge
  - 8 Other Durham
  - 9 Ottawa
  - 10 Kingston/ Frontenac
  - 11 Belleville
  - 12 Prince Edward/ Northumberland
  - 13 Other Eastern Ontario
  - 14 Kitchener/ Waterloo/ Guelph





- 15 Niagara
- 16 Windsor/ Essex
- 17 Hamilton/ St. Catharine's
- 18 London/ Middlesex
- 19 Other Southwest Ontario
- 20 Northern Ontario (including Nipissing, Manitoulin, Parry Sound, Greater Sudbury, Timiskaming, Cochrane, Algoma, Thunder Bay, Rainy River, Kenora)

Those are all my questions today—Thank you!





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