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2019 Interim Framework Small Business Lighting Evaluation Report

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1. Executive Summary

The Independent Electricity System Operator (IESO) retained Nexant, Inc., and their sub-contractor, NMR Group, Inc., to conduct an evaluation of the Small Business Lighting program (SBL) for the 2019 Interim Framework (IF) evaluation cycle. This Executive Summary provides a high-level overview of the impact and process evaluation results as well as the key findings and recommendations for the Small Business Lighting (SBL) Program during the April 1, 2019 through December 31, 2019 evaluation period.

The SBL program provides owners and tenants of commercial, institutional, and agricultural facilities, as well as multi-family buildings, the opportunity to receive up to $2,000 in free lighting upgrades. Participants who wish to have qualified equipment installed above the $2,000 limit are eligible for additional incentives, which are intended to further the program's impacts and reach. Eligible measures are defined by the program and include a wide variety of lighting fixtures and lamps.

1.1 Evaluation Goals and Objectives

The goals and objectives of the 2019 SBL program are as follows:

- Conduct audits of completed projects to verify the installation of equipment and evaluate operating parameters through desk reviews
- Verify energy and demand savings with a high degree of confidence and precision
- Assess free-ridership (FR) and participant spillover (SO) to determine an appropriate net-to-gross (NTG) ratio
- Review and compare key program elements as informed by the IESO program staff, program delivery vendor staff, assessors, installers, and participants
- Provide recommendations on program improvements based on feedback obtained through the evaluations

1.2 Results

1.2.1 Impact Evaluation

The Interim Framework (IF) Small Business Lighting (SBL) program's outreach process and site assessments began in April 2019, with the first installation completed later in May 2019. There were 4,488 projects completed, with a total of 124,426 measures installed under the 2019 SBL Program. The Central region (29%) is the primary contributor to the program net savings, followed by the Eastern (20%) and Southwestern (18%) regions. The net verified impact results of the 2019 SBL Program are presented in Table 1-1 and Table 1-2.

Table 1-1: 2019 SBL Program Impact Results: Energy

Reported Energy Savings (MWh)	Energy Realization Rate	Gross Verified Energy Savings (MWh)	Gross Verified Precision at 90% Confidence	Net-to-Gross Ratio	Net Verified Energy Savings (MWh)	Lifetime Net Verified Energy Savings (MWh)	Net Verified Energy Savings at 2022 (MWh)
34,175	83.6%	28,574	6%	98.3%	28,087	327,966	28,067

Table 1-2: 2019 SBL Program Impact Results: Summer Peak Demand

Reported Summer Peak Demand Savings (MW)	Summer Peak Demand Realization Rate	Gross Verified Summer Peak Demand Savings (MW)	Gross Verified Precision at 90% Confidence	Net-to-Gross Ratio	Net Verified Summer Peak Demand Savings (MW)	Net Verified Summer Peak Demand Savings at 2022 (MW)
8.2	85.9%	7.0	2%	98.2	6.9	6.9

The retail sector, followed by restaurants and warehouses, were the main contributors to the 2019 SBL program's first year net savings and accounted for just under half of the program's overall savings. The retail sector made up about 29% of completed projects and accounted for 23% of the total SBL program net energy savings, followed by restaurants (13% of net energy) and warehouses (12% of net energy). Moreover, savings in 2019 were produced primarily by T8 Linear LEDs and Screw-in LEDs (specifically LED A-Lamps), as these two measures amounted to 53% and 31% of the total energy savings, respectively.

The implementation cost per kWh of net verified energy savings for the 2019 SBL program varied between $0.09 and $0.35 depending on the facility type, with an average of $0.25/kWh. The implementation cost accounts for the total project cost charged by the delivery agent, including the IESO paid incentive and customer contribution (if any). Retail facilities and warehouses had the highest cost per kWh of net verified savings, with an average of $0.32/kWh. In contrast, agricultural and hotel/motel facilities had the lowest cost, with an average of $0.11/kWh. This wide variation in cost is mainly attributed to the different measure types implemented at each facility. The high cost resulted from installing more Linear LED Tubes and Outdoor fixtures, while the lower cost was attributed to installing a higher quantity of Screw-in fixtures.

1.2.2 Process Evaluation

To better understand the program design and delivery in 2019, a process evaluation was carried out. Primary data was collected to support this evaluation through interviews with the IESO staff and program delivery staff, and surveys with assessors, installers, and participants. Key insights from the process evaluation are summarized in Section 1.3 and presented in detail in Section 5.

1.3 Key Findings and Recommendations

Finding 1: SBL Assessment Tool (Hours of Operation)

- ***Recommendation 1:*** Nexant recommends upgrading the existing Assessment Tool and allow for the creation of multiple schedules within the same facility, where measures can be appropriately assigned to their respective operating schedules.

Finding 2: SBL Assessment Tool (Reported Demand Savings)

- ***Recommendation 2:*** Nexant recommends utilizing the facility operating schedule data to calculate the corresponding portion of the change in the connected load that occurred during the peak demand window. This peak coincidence factor (CF) of each project will allow the program to accurately report the summer peak demand savings.

Finding 3: Program free-ridership (FR) was very low in 2019 at 98.3%

- ***Recommendation 3:*** Maintain focus on minimizing FR. Key areas of focus include (1) identifying and targeting customers who would not make upgrades without program support and (2) identifying applicants who have not already begun implementing measures.

Finding 4: Satisfaction with the program and its processes was high overall, but there is room for improvement. Participants, assessors, and installers provided several suggestions for improving the application process.

- ***Recommendation 4a:*** Shorten the time it takes to complete the assessment and installer visits. Identify areas where additional program support or resources could make shorter visits easier for the assessors/installers to accomplish.

- ***Recommendation 4b:*** Provide additional training to assessors and installers to ensure professionalism during assessments and installer visits.

- ***Recommendation 4c:*** Provide more flexibility in scheduling the visits (for example, coordinate with participants to identify suitable times for the visit and provide accurate arrival windows).

Finding 5: Additional cross-program promotion opportunities exist. Nearly three-fourths (73%) of the SBL participants had not applied to any other energy-efficiency programs in 2019.

- ***Recommendation 5:*** Continue to identify cross-program promotion opportunities, especially with programs like REP, which target similar small business customers.

2. Evaluation Goals and Objectives

The goals and objectives of the 2019 SBL program are as follows:

- Verify energy and demand savings with a 10% precision at 90% confidence while considering the following:
  - Measures installed through the program
  - Program-enabled savings
  - Savings from lighting interactive effects
- Assess free-ridership (FR) and participant spillover (SO) to determine an appropriate net-to-gross (NTG) ratio
- Review and compare key program elements as informed by the IESO program staff, program delivery vendor staff, assessors, installers, and participants
- Provide recommendations on program improvements based on feedback obtained through the evaluations

A summary of the evaluation methodologies is presented in Section 3, with results of the impact and process evaluations presented and discussed in Section 4 and 5, respectively, job impacts assessment in Section 6, and findings and recommendations in Section 7.

3. Evaluation Methodology

The energy and demand savings were verified by conducting the following impact evaluation activities:

- Sampling projects
- Performing project audits on sampled sites
- Comparing the gross reported savings to the savings established by desk reviews to determine realization rates
- Estimating net-to-gross ratios and net savings using attribution surveys

3.1 Impact Evaluation Methodology

Independently verifying the energy and demand savings and attributing these savings to the program requires selecting sample of projects that represent the program's population. Creation of a representative sample ensures that sample results can be applied to the program's population reported savings to verify gross and net impacts with minimal uncertainty. A random sampling of projects was completed by studying the population and developing a sampling plan based on the following factors:

- Participation levels provided in the 2019 program database extract
- Overall confidence/precision targets of 90/10 at the program level for each program year assuming a coefficient of variation (C_V) of 0.5

The total 2019 targeted sample size was 68 projects out of a full program population of 4,488 projects.

3.1.1 Project Audits

Subsequent to the sampling process, project audits were completed on a subset (72 projects) of the entire SBL program population (4488 projects) as determined through the sampling plan. Sampled SBL projects received Level 1 audits. Level 1 audits consist of desk reviews of project documentation available from the program delivery vendor and include project applications, equipment specification sheets, auditors' notes on equipment installed, invoices for equipment, and any other documentation submitted to the program. Evaluation of the SBL style program often includes Level 2 audits with on-site visits and extensive metering to estimate lighting hours of use. However, the 2019 evaluation cycle was disrupted by the COVID-19 pandemic with corresponding facility closures and social distancing requirements, leading to the disruption of on-site visits. In instances where on-site visits were not possible, desk reviews were performed.

3.1.2 Reported Savings

Gross reported savings are the energy and summer peak demand savings derived from information submitted on participant applications and reflect the equipment installed throughout the program. This information was provided to the evaluation team through the program participation data extract provided by the IESO.

3.1.3 Verified Savings

The data collected during the project audit activities was used to calculate energy and summer peak demand savings for each measure in an evaluated project. The sum of these verified energy and demand savings represent estimates of the project level savings due to the SBL program incentivized equipment.

The energy and demand realization rates were then calculated for the evaluation sample by comparing the sum of the verified savings for each evaluated project to the program reported savings for the same sampled projects. Equation 3-1 shows the formula for calculating the program realization rate.

Equation 3-1: Realization Rate

$$\text{Realization Rate} = \frac{\sum_i^n Savings_{\text{verified}}}{\sum_i^n Savings_{\text{reported}}}$$

Where:

$Savings_{verified}$ = Energy (kWh) or demand (kW) savings verified for each project in the sample

$Savings_{reported}$ = Energy (kWh) or demand (kW) savings reported by the program team for each project in the sample

The realization rate is then applied to the reported savings from all of the program's projects to provide the gross verified savings attributable to the program. The total verified savings reflect the direct energy and demand impact of the program's operations. However, these savings do not account for customer or market behaviour impacts that may have been added to or subtracted from the program's direct results. These market effects are accounted for through the net impact analysis.

3.1.4 Interactive Effects for Lighting Equipment

The SBL program incentivizes the installation of lighting equipment that has higher efficiency levels compared to commonly installed lamps and fixtures. Ideally, these high-efficiency equipment should consume less energy. However, it is understood that the equipment's energy consumption in an enclosed space cannot be viewed in isolation. Building systems interact with one another, and a change in one system can affect a separate system's energy consumption. This interaction should be considered when calculating the benefits provided by the program. Examining cross-system interactions provides a comprehensive view of building-level energy changes, rather than limiting the analysis to solely the energy change that directly relates to the modified equipment. The IESO Evaluation Measurement and Verification (EM&V) Protocols state that interactive energy changes should be quantified and accounted for whenever possible. Based on this guidance, interactive effects were calculated for all energy-efficient lighting measures installed through the program to capture changes in the operation of heating, ventilation, and air conditioning (HVAC) equipment due to lower heat loss from energy-efficient lighting equipment.

3.1.5 Lifetime Savings

When performing the impact evaluation, it is important to consider the total amount of savings over the lifetime of retrofitted equipment. This consideration is necessary given that energy savings, demand savings, avoided energy costs, avoided capacity costs, and other benefits continue to accrue each year the equipment is in service. The method used to calculate lifetime energy savings at a measure level is shown in Equation 3-2.

Equation 3-2: Lifetime Energy Savings

$$Lifetime\ Energy\ Savings = EUL \times Annual\ Energy\ Savings$$

Where:

EUL = Estimated Useful Life of the retrofitted equipment

3.1.6 Net Verified Savings

To calculate the net verified savings, the portion of gross verified savings attributable to the program was calculated. The net verified savings were determined by multiplying the gross verified savings by the net-to-gross (NTG) ratio, as shown in Equation 3-3.

Equation 3-3: Net Verified Savings

$$Savings_{net} = Savings_{\text{verified}} \times NTG$$

Where:

$Savings_{net}$ = Net verified savings impact (kW or kWh)

$Savings_{\text{verified}}$ = Verified savings (kW or kWh)

NTG = Net-to-gross

To estimate the direct influence of the program in generating net verified energy savings, attribution surveys were implemented to calculate free-ridership (FR) and spillover (SO) rates. Both FR and SO are represented as percentages of the program's total reported savings and estimated for each survey respondent. The results are then aggregated to develop total FR and SO estimates and are weighted by the percent of savings associated with each respondent's completed energy-efficiency project. Therefore, respondents with comparatively larger projects influence the total estimates more so than smaller projects, allowing for results that are reflective of the responding participants and their associated impact on the program.

FR refers to the program savings attributable to free riders, which are program participants who would have implemented a program measure or practice in the program's absence. SO refers to additional reductions in energy consumption and demand due to program influences beyond those directly associated with program participation. SO represents installations of energy-efficient equipment influenced by the participant's experience with the program and completed without receiving any program incentives or other financial support.

The NTG ratio is defined by Equation 3-4, where FR is the participant free-ridership percentage, and SO is the participant spillover percentage.

Equation 3-4: Net-to-gross Ratio

$$NTG = 100\% - FR + SO$$

FR and SO were calculated for a single incented project for each sampled participant, and these results were combined to develop overall FR, SO, and NTG values.

Additionally, the participant survey collected data to assess if rebound effects occurred due to the program-supported upgrades. An example of the lighting-specific rebound effect involves leaving efficient lighting turned on for extended periods. An example of the heating and cooling-specific rebound effect includes increasing or decreasing the thermostat settings for extended periods relative to the thermostate settings prior to program participation. Rebound effects questions were not used to calculate the NTG score, and were only collected to provide additional context around participant behaviors following the installation of the program-incentivized equipment.

Additional detail regarding the NTG evaluation methodology can be found in Appendix A.

3.2 Process Evaluation Methodology

3.2.1 Sampling, Interviews, and Surveys

The process evaluation focused on program design and delivery. Program processes were assessed through interviews and surveys with relevant program actors, including the IESO program staff, program delivery vendor staff, assessors, installers, and participants. For each respondent type, a customized interview guide or survey instrument was developed to ensure responses produced comparable data and allowed for the inference of meaningful conclusions.

Table 3-1 presents the survey methodology, the total population invited to participate in the surveys or interviews, the total number of completed surveys or interviews, and the sampling error at the 90% confidence level for each respondent type. The following subsections provide context regarding each surveyed group.

Additional detail regarding the process evaluation methodology can be found in 9.

Table 3-1: Process Evaluation Primary Data Sources*

Respondent Type	Methodology	Population	Completed	90% CI Error Margin
IESO Program Staff	Phone In-depth Interview (IDI)	1	1	0%
Program Delivery Vendor Staff	Phone IDI	1	1	0%
SBL Assessors and Installers	Web Survey	110	24	15.2%
SBL Participants	Web and Phone Survey	987	205	5.1%

***Error margin not displayed if the respondent count is below 30 unless census is achieved.**

3.2.2 IESO Program Staff and Program Delivery Vendor Staff Interviews

In-depth interviews (IDI) with one member of the IESO program staff and one member of the program delivery vendor staff were completed. The appropriate staff to interview were identified in consultation with the IESO EM&V staff. Interview topics addressed program roles and responsibilities, program design and delivery, marketing and outreach, market actor engagement, program strengths and weaknesses, and suggestions for improvement.

3.2.3 Assessor and Installer Survey

A total of 110 unique companies (20 assessors and 90 installers) were emailed to request their participation in the survey. A total of 24 participants responded to this request and completed the survey. The sample was developed from program records provided by the program delivery vendor staff. The survey topics addressed firmographics, project background, training and education, customer participation, suggestions for improvement, job impacts, and impacts of the COVID-19 crisis.

3.2.4 Participant Survey

A total of 987 companies were contacted by phone or email to request their participation in the survey. A total of 205 participants responded to this request and completed the survey. The sample was developed from program records provided by the IESO EM&V staff. The survey topics addressed firmographics, suggestions for improvement about the initial site assessment, the follow-up visit, the overall installation process, FR, SO, rebound effects, job impacts, participation in other programs, and impacts of the COVID-19 crisis.

3.3 Job Impacts Assessment

The analysis of job impacts utilized the Statistics Canada[1] (StatCan) Input-Output (IO) model to estimate the direct, indirect, and induced job impacts. IO models are used to analyze the propagation of exogenous economic shocks throughout an economy. The models represent relationships, or flows, of inputs and outputs between industries. When an Energy Efficiency (EE) program such as the SBL is funded and implemented, it creates a set of "shocks" to the economy, such as demand for specific products and services and additional reinvestment by businesses from energy bill savings. These shocks propagate throughout the economy, and their impacts can be measured in terms of variables such as economic output and employment.

3.3.1 Statistics Canada IO Model

The Industry Accounts Division of StatCan maintains two versions of the Canadian IO model: a national and an interprovincial model[2]. The models are classical Leontief-type open-IO models[3], where some production is consumed internally by industries, while the rest is consumed externally. The models provide detailed information on the impact of exogenous demands on industry outputs. The impacts are quantified in terms of production, value-added components (such as wages and surplus), expenditures, imports, employment, energy use, and industry pollutant emissions. The StatCan IO Model is composed of input, output, and final demand tables. The IO tables are published annually with a lag of approximately three years, so the model used for this analysis represents the Canadian economy from 2016. The model has been used to estimate employment impacts from a wide range of economic shocks, including structural changes to the Canadian economy[4], the bovine spongiform encephalitis (BSE) crisis in the early-mid 2000's[5], and the construction of hydropower projects[6].

[1] Statistics Canada is the Canadian government agency commissioned with producing statistics to help better understand Canada, its population, resources, economy, society, and culture.

[2] Statistics Canada - Industry Accounts Division System of National Accounts; (2009). User's Guide to the Canadian Input-Output Model. Statistics Canada. Ret

[3] Ghanem, Ziad; (2010). The Canadian and Inter-Provincial Input-Output Models: The Mathematical Framework. Statistics Canada – Industry Accounts Division.

[4] Gera, S & Masse, P; (1996). Employment Performance in the Knowledge-Based Economy, Gouvernement du Canada - Industrial Organization 14, Gouvernement du Canada - Industry Canada.

[5] Samarajeewa, S. et al.; (2006). Impacts of BSE Crisis on the Canadian Economy: An Input-Output Analysis. Prepared for the Annual Meeting of the Canadian Agricultural Economics Society.

[6] Desrochers, R. et al.; (2011). Job Creation and Economic Development Opportunities in the Canadian Hydropower Market. Canadian Hydropower Association.

The supply and use tables (SUTs) for the Canadian IO model break the economy down into 240 industries and 500 supply and use product classifications (SUPCs). They represent the economic activity of a specific Canadian province or the whole country. The SUTs show the Canadian economy's structure, with goods and services flowing from production or import (supply tables) to intermediate consumption or final use (use tables). Intermediate consumption refers to domestic industries using goods and services to produce other products and services. Final use includes consumption of products by households, non-profit institutions serving households, and governments, including capital formation, inventory changes, and exports. Provincial SUTs are similar to national SUTs, but for the addition of interprovincial trade to go along with international imports and exports.

StatCan offers the IO Model as a service but not as a product. StatCan economists work with researchers to develop the data and required inputs to develop and answer specific research questions using the model. The end product is a set of outputs from running the model.

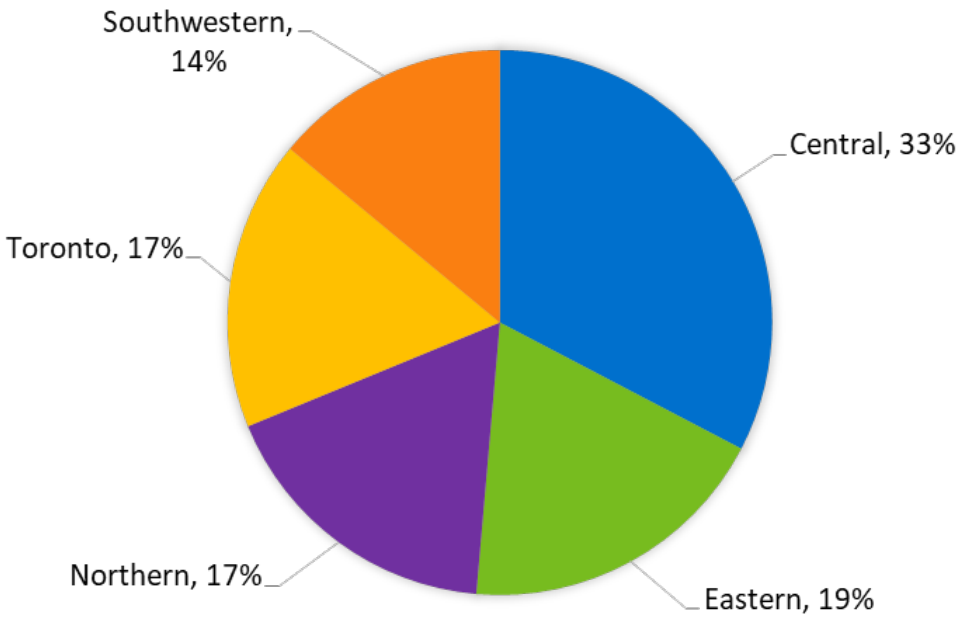
4. Impact Evaluation

The SBL program's outreach process and site assessments began in April 2019, with the first installation completed later in May 2019. There were 4,488 projects completed, with a total of 124,426 measures installed under the program.

4.1 Participation

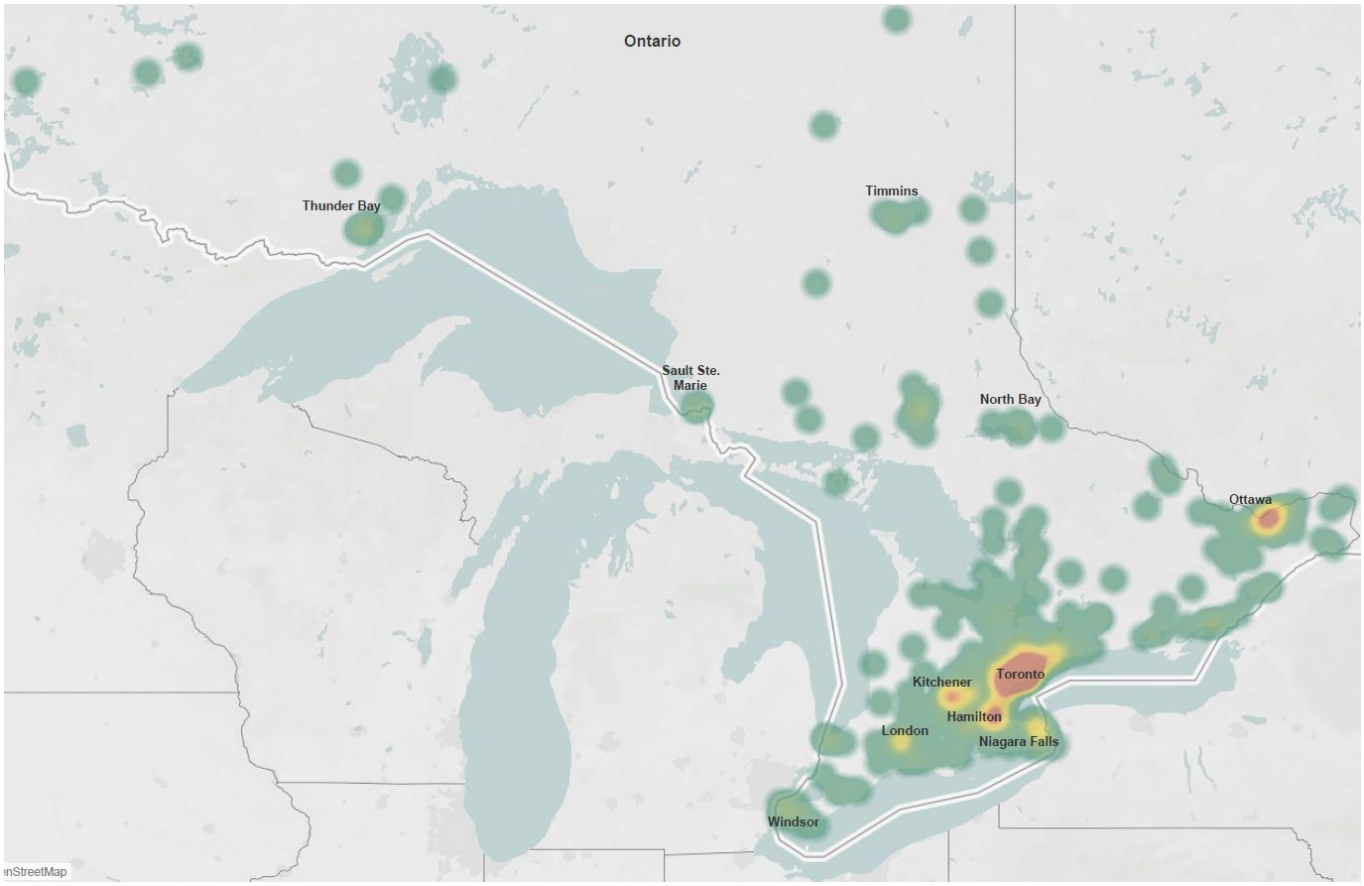
The 2019 SBL program database contained postal code information for each completed project. Each project was assigned to one of five geographical delivery regions. The Central region is the primary contributor to the SBL project, where it made up 33% of the completed projects, followed by the Eastern region (19%) and the Northern region (17%). The full breakout of projects completed in each geographical region is presented in Figure 4-1.

Figure 4-1: 2019 SBL Program Projects in Each Geographical Region



The heat map in Figure 4-2 illustrates the geographic distribution of 2019 SBL projects across Ontario. Red, orange and yellow color scales show areas with a greater denisty of projects, and the green overlay represents additional areas of program activity. Projects are concentrated in the southern part of the province and Ottawa, with hot spots around metropolitan areas such as Toronto, Hamilton, and Kitchener indicating that majority of the projects were completed in these locations.

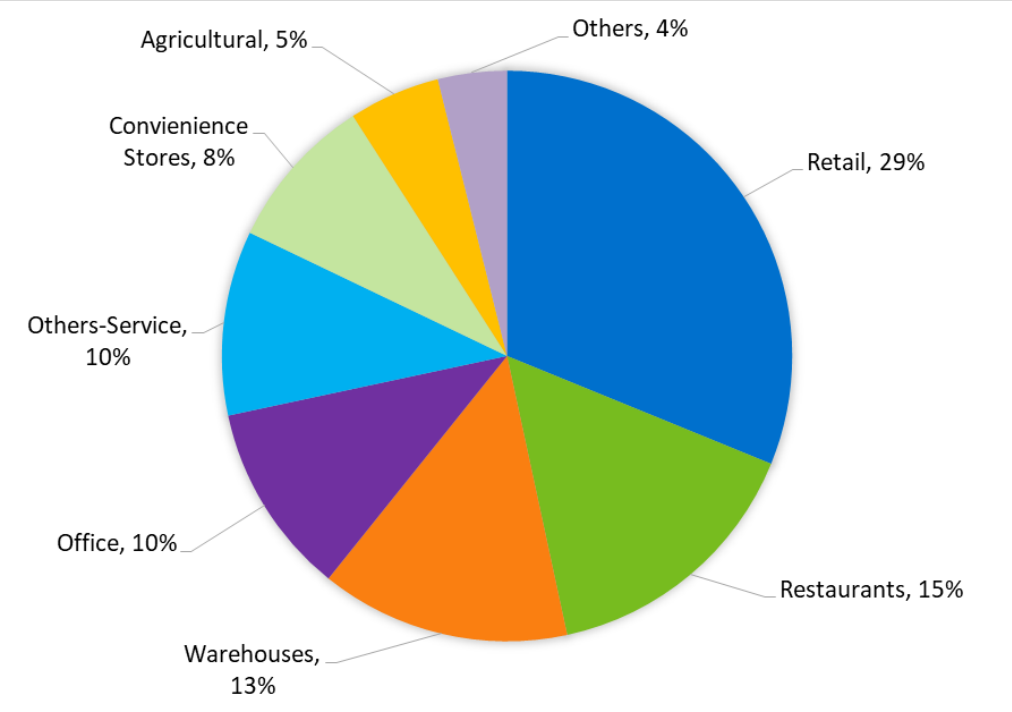
Figure 4-2: SBL Program Projects Distribution across Ontario



4.1.1 Participation by Facility Type

The SBL Assessment Tool used in 2019 allowed the assessors to track and document each assessed site's facility type. The SBL database contained information regarding each completed project's facility type, and in total, there were 45 unique facility types reported. Each unique entry was re-categorized into one of 10 possible facility types. A full list of the facility types reported in the 2019 SBL program database and their respective re-categorized designation is provided in Appendix D. The retail sector, followed by restaurants and warehouses, contributed most to the 2019 SBL program, accounting for 57% of completed projects. The project count contribution by each facility type for the 2019 SBL program is presented in Figure 4-3.

Figure 4-3: 2019 SBL Program Project Count by Facility Type



4.2 Impact Results

The net verified impact results of the 2019 SBL program are presented in Table 4-1 and Table 4-2. All savings discussed in the remainder of this report refer to first year net savings unless otherwise specified.

Table 4-1: 2019 SBL Program Impact Results: Energy

Reported Energy Savings (MWh)	Energy Realization Rate	Gross Verified Energy Savings (MWh)	Gross Verified Precision at 90% Confidence	Net-to-Gross Ratio	Net Verified Energy Savings (MWh)	Lifetime Net Verified Energy Savings (MWh)	Net Verified Energy Savings at 2022 (MWh)
34,175	83.6%	28,574	6%	98.3%	28,087	327,966	28,067

Table 4-2: 2019 SBL Program Impact Results: Summer Peak Demand

Reported Summer Peak Demand Savings (MW)	Summer Peak Demand Realization Rate	Gross Verified Summer Peak Demand Savings (MW)	Gross Verified Precision at 90% Confidence	Net-to-Gross Ratio	Net Verified Summer Peak Demand Savings (MW)	Net Verified Summer Peak Demand Savings at 2022 (MW)
8.2	85.9%	7.0	2%	98.2	6.9	6.9

The program realization rates presented in Table 4-1 and Table 4-2 include the interactive effects that occurred in the first year. The methodology for calculating the interactive effects is described in 0, and the calculation of the NTG ratio is described in 3.1.5.

The 2019 SBL program achieved 327,966 MWh of lifetime net verified energy savings, with 28,067 MWh of the annual savings persisting until 2022. The lifetime savings of the SBL program depend mainly on the effective useful lives (EULs) of the SBL measures, which describe how long the savings associated with the measure will persist. The IESO's list of eligible SBL measures provides an estimated rated lifespan in hours for each measure. The rated life and assumed hours of use (HOU) are used to calculate each measure's EUL. For example, the average rated life of a Linear LED Tube is 50,000 hours, and its assumed average HOU is 3,700 hours annually, leading to a calculated EUL of 13.5 years (50,000 hours /3,700 hours).

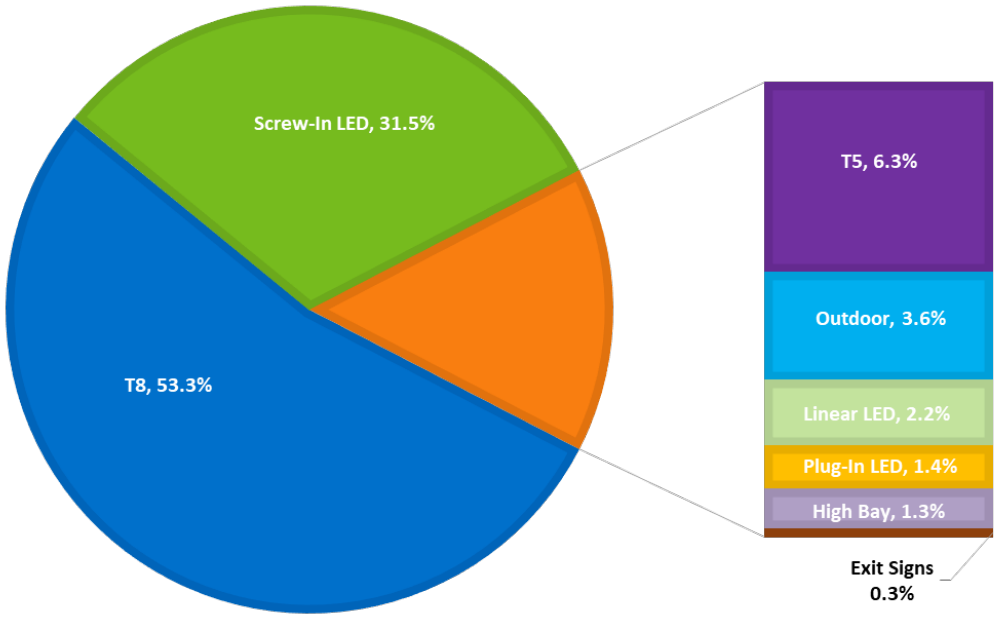
4.3 Impact Findings

Detailed impact findings on the measures installed, first year net savings, contribution by measure, types of facilities upgraded, incentives, and program realization rates are provided in the following sections.

4.3.1 SBL Measure Types

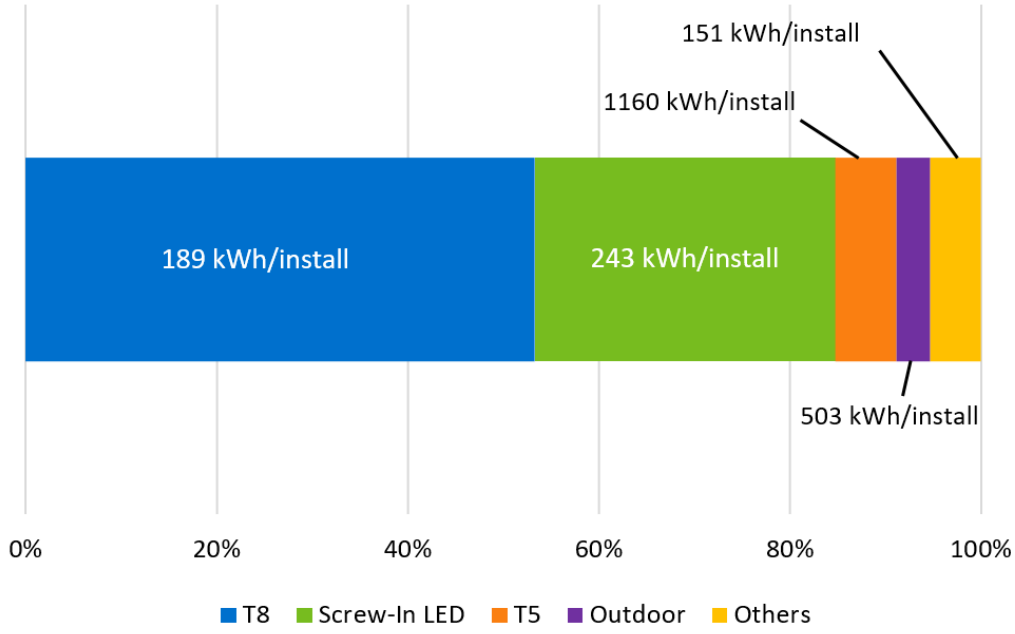
The SBL program's first year net savings in 2019 were produced primarily by T8 Linear LEDs and Screw-in LEDs (specifically LED A-Lamps). These two measures made up 53% and 31% of the total energy savings in 2019, respectively. The full distribution of energy savings by measure type in the 2019 SBL program is shown in Figure 4-4.

Figure 4-4: 2019 SBL Net Energy Savings Contributions by Measure Type



A breakdown of the produced savings per measure/unit installed for the 2019 SBL program is provided in Figure 4-5. T8 installations have accounted for 53.3% of the program's net energy savings, with an average savings of 189 kWh per measure. Contrarily, T5 installations accounted for merely 6.3% of the total program energy savings, though they had the highest energy savings of 1,160 kWh per installation. The Others category in Figure 4-5 refers to the mix of the remaining measures that contributed to the 2019 SBL program and accounted for 5% of the total program energy savings, with an average of 151 kWh per install. These measures mainly consisted of Linear LED Troffers and 8' Luminaries, and Plug-in LEDs.

Figure 4-5: 2019 SBL per Measure Energy Savings Contribution



4.3.2 SBL Facility Types

As discussed in Section 4.1.1, the retail sector accounted for the most (29%) completed projects in 2019, followed by restaurants (15%) and warehouses (13%). A similar trend for the achieved energy and demand savings was observed. As shown in Figure 4-6, the top contributors to the 2019 SBL program's net savings were the retail facilities (23%), followed by restaurants (13%) and warehouses (12%). The installation cost per kWh of net verified savings (Figure 4-7) for the program varied between $0.09 and $0.35, depending on the facility type, with an average of $0.25/kWh. This cost accounts for the total project cost charged by the delivery agent, including the IESO paid incentive and customer contribution (if any). The Others category contributed to only 3% of the total program savings and had the highest cost of $0.35/kWh. This is mainly attributed to 84 projects carried out at educational facilities and 70 projects with unidentified facility types.

Figure 4-6: 2019 SBL Program Net Energy Savings by Facility Type Composition

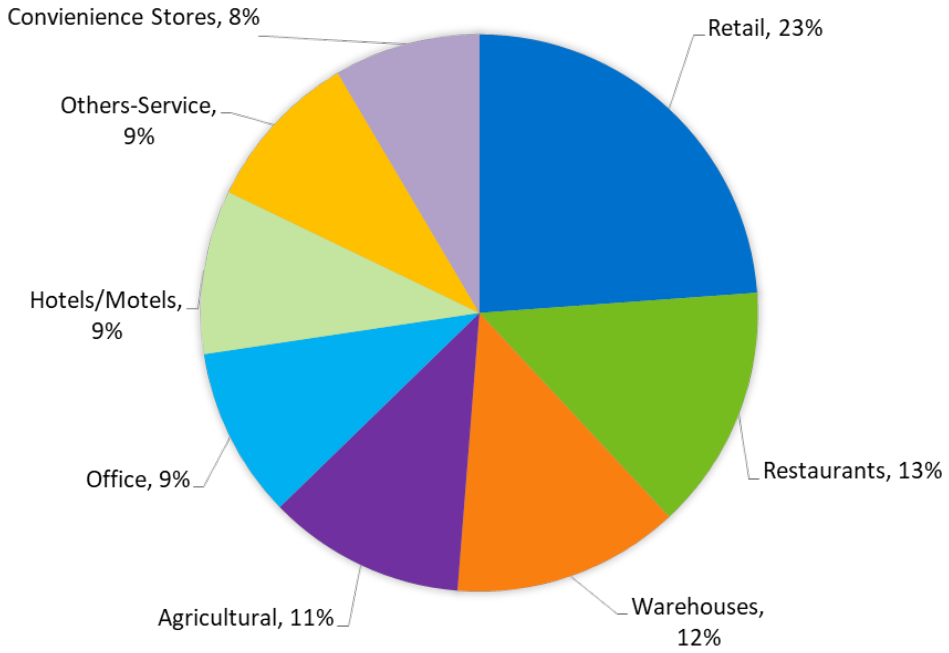
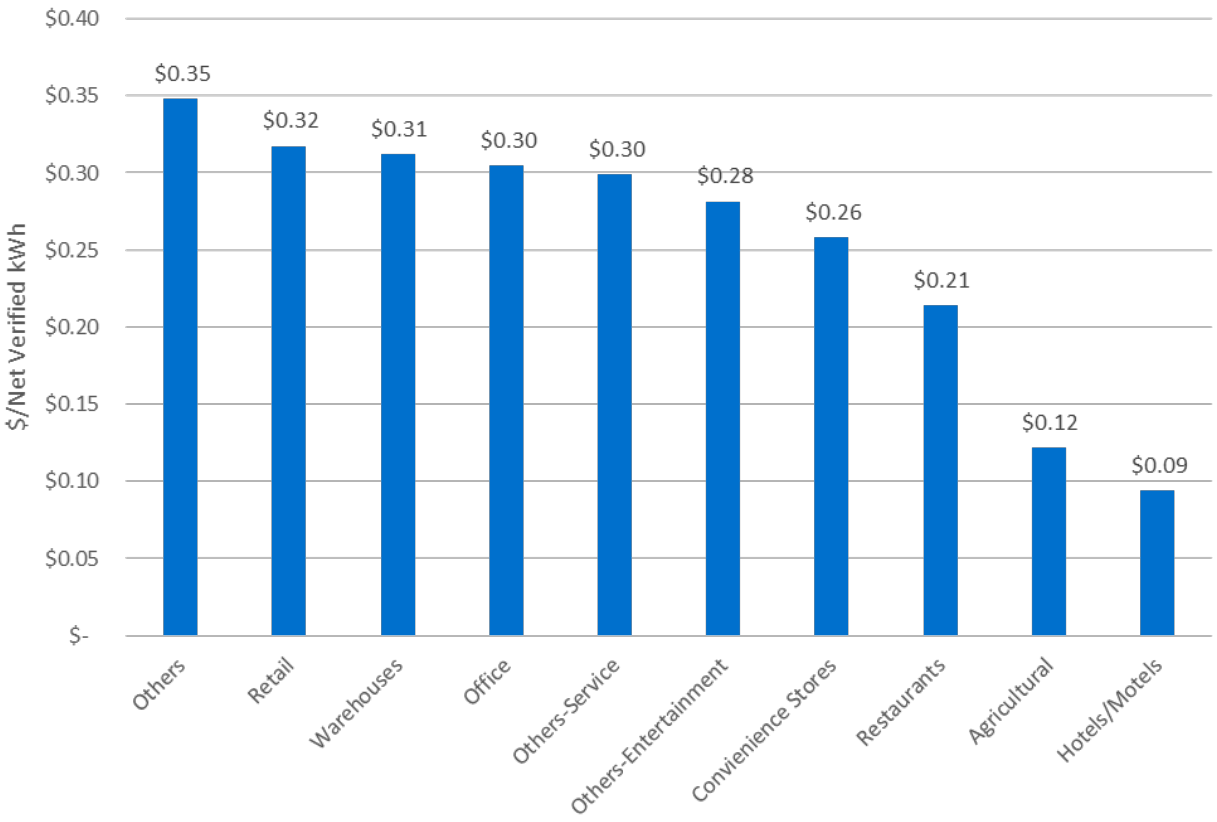


Figure 4-7: 2019 SBL Facilities Implementation Cost per kWh



This wide variation in cost is mainly attributed to the different measure types implemented at each facility. The high cost resulted from installing more Linear LED Tubes and Outdoor fixtures, while the lower cost was attributed to installing a higher quantity of Screw-in fixtures.For instance, retail facilities and warehouses, which had an average cost of $0.32/kWh, had 67% and 49% of their savings produced by Linear T8 LED Tubes, respectively. In contrast, both agricultural and hotel/motel facilities, which had an average cost of $0.11/kWh, had 67% of their savings through A-lamps replacement.

4.3.3 Incentive Cap

The current design of the SBL program provides participants with the opportunity to receive up to $2,000 in free lighting upgrades. Participants who wish to install qualified equipment above the $2,000 limit are eligible for additional incentives intended to strengthen the program's impacts and reach. Evaluation analysis shows that 72% of the 2019 SBL participants did not exceed the maximum incentive, nor did they implement any measures beyond the cap. The average project incentive was $1,401. Only 28% of the participants exceeded the $2,000 limit and paid out of pocket to install additional measures, with an average participant out of pocket payment of $675/project. The average additional incentive beyond the $2,000 cap is $183.

4.3.4 Realization Rates

The standard equations for calculating energy and peak demand savings produced by lighting retrofits depend on three main inputs: hours of use (HOU), fixture wattages, and fixture counts. A difference between the verified and reported values across these three main inputs will lead to an adjustment in savings through the realization rate.

Due to in-person interaction restrictions imposed by the COVID-19 pandemic, site audits for the 2019 SBL program were not feasible, leading to project verification and data collection solely through desk reviews. The data used for impact evaluation analyses was limited to what was available in the 2019 SBL program project files and the data collected from participants during phone interviews. Overall, participants were able to confirm the implementation of the measures, the measure types and facility hours of use, though in most cases, they could not provide exact counts or fixture wattages.

4.3.5 Energy

The energy realization rate for the 2019 SBL program is 83.6%. The main contributor to the energy realization rate is the deviation between the verified hours of use from the reported hours of use for the sampled projects.

Hours of Use

Assessors of the 2019 SBL program are required to fill out a Small Business Lighting Assessment Tool. The assessment tool details the inventory of lighting equipment installed and removed and calculates the energy and demand savings accordingly. Assessors need to input the facility's lighting operating schedule, which determines the hours of use through which energy savings are calculated. The tool only accepts one schedule for the entire facility. Fifteen (15) instances were found in the sample (n=75), where lighting equipment was installed in multiple spaces with varying schedules. Additionally, the tool accepts schedule inputs in terms of a weekly schedule, which is assumed to be constant over the entire year. Nine (9) instances were found within the sample where the facility, and therefore the installed lighting equipment operated at varying weekly schedules throughout the year. With only one input schedule, assessors tended to input the schedule that corresponded to the greatest amount of hours a light would operate if varying schedules were observed. This resulted in overestimated energy savings by 22% within the sample. It is

The 2019 SBL program did not rely on a deemed HOU assumption. However, for reference, the average HOU associated with the 75 sampled sites is 3,262 hours/year.

Interactive Effects

The reported savings achieved through the 2019 SBL program did not include interactive effects observed on the operation of HVAC equipment through the installation of more efficient lighting fixtures. The verified savings were calculated both with and without these interactive effects. The results of the different calculation methodologies are detailed in Table 4-3. The verified energy savings presented elsewhere in this report include interactive effects.

Table 4-3: Significance of Interactive Effects on 2019 SBL Energy Savings

Interactive Effects	Reported Gross Energy Savings (MWh)	Energy Realization Rate	Verified Energy Savings (MWh)	Additional Interactive Savings (MWh)	Gas Heating Penalty (Therms)
Not Included	34,175	79.4%	27,145	-	-
Included	34,175	83.6%	28,574	1,429	531,470

4.3.6 Summer Peak Demand

The summer peak demand realization rate for the 2019 SBL program is 85.9%. The main contributor to the summer peak demand realization rate is that the program's reported demand savings reflect the change in connected load and are not adjusted for peak coincidence[7]. Additionally, the reported demand savings do not include interactive effects, while the verified summer peak demand savings accounted for these effects. Table 4-4 shows the verified summer peak demand savings both with and without these interactive effects.

Table 4-4: Significance of Interactive Effects on 2019 SBL Summer Peak Demand Savings

Interactive Effects	Reported Gross Summer Peak Demand Savings (MW)	Summer Peak Demand Realization Rate	Verified Gross Summer Peak Demand Savings (MW)	Additional Interactive Savings (MW)
Not Included	8.2	72.7%	5.9	-
Included	8.2	85.9%	7.0	1.1

The 2019 SBL Assessment Tool collects actual HOU data for each assessed facility. It is recommended to utilize this data to calculate the corresponding portion of the change in the connected load that occurred during the peak window, or the peak coincidence factor (CF) of each project. This would help to accurately report summer peak demand savings.

4.4 Net-to-Gross (NTG)

The NTG evaluation results are presented in the following subsections, and 10 presents additional detail.

4.4.1 Net-to-gross Results

Table 4-5 presents the results of the 2019 SBL program NTG evaluation. The evaluation targeted and achieved 90% confidence and 10% precision levels when calculating NTG for this program. The following subsections summarize the completed analyses for the interpretation of these values.

Table 4-5: SBL Program Net-to-gross Results

Program Delivery Method	NTG Responses	Savings Weighted FR*	Energy SO*	Demand SO*	Energy Savings Weighted NTG* %	Demand Savings Weighted NTG* %
Central Delivery	205	0.04	0.023	2%	0.983	98%

***Note: FR: Free-ridership; SO: Spillover; NTG: Net to gross**

[7] IESO's summer peak demand definition is understood to be 1:00 PM through 7:00 PM on non-holiday weekdays in June through August.

4.4.2 Key Findings

Key findings from the NTG analysis include the following:

- Participant feedback indicates very low levels of FR at 4%.
- Two-thirds (66%) of participants were not planning on upgrading their lighting before learning about the program.
- Of those that were already planning on upgrading their lighting, more than two-fifths (44%) would have waited at least one year, and almost one-sixth (15%) would have installed less expensive or less efficient lighting without the program.
- Less than one in ten (7%) would have installed the same lighting equipment and paid the full cost themselves, which is indicative of some level of FR.
- The availability of the program upgrades at no-cost had the greatest influence on the respondents' decision to participate in the program (91%).
- Participation in the program resulted in a low SO at 2.3%. Around one-tenth (11%) installed equipment with attributable SO savings.

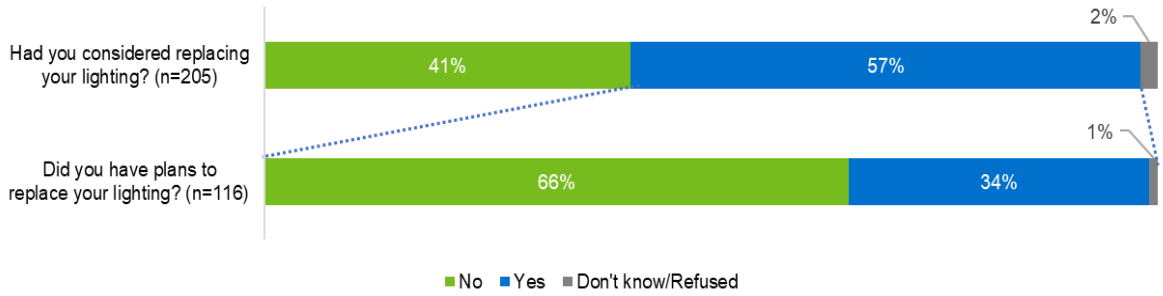
4.4.3 Free-ridership (FR)

The extent of FR within the program was assessed by surveying the SBL participants to understand their experiences and plans before learning about the program, what they would have done in the absence of the program, and how influential the program was on their decision to implement the energy-efficient upgrades.

Participants were first asked whether they *had considered* or *had plans* to implement lighting upgrades before learning they could receive energy-efficiency incentives through the SBL program Over one-half (57%) of the survey respondents had considered replacing their lights before being contacted by the program, while over two-fifths (41%) had not.

Of the survey respondents who stated they had considered replacing their lights, about one-third (34%) already *had plans* to install new lighting before they learned of the program, indicating potential FR (Figure 4-8). However, two-thirds (66%) of the survey respondents who *had considered* new lighting did not plan for any installations prior to learning about the program, indicating the program had some influence on their decision to begin the project. While responses to these questions were not included in the estimation of the FR score, they provided additional context for understanding the participants' decision-making processes.

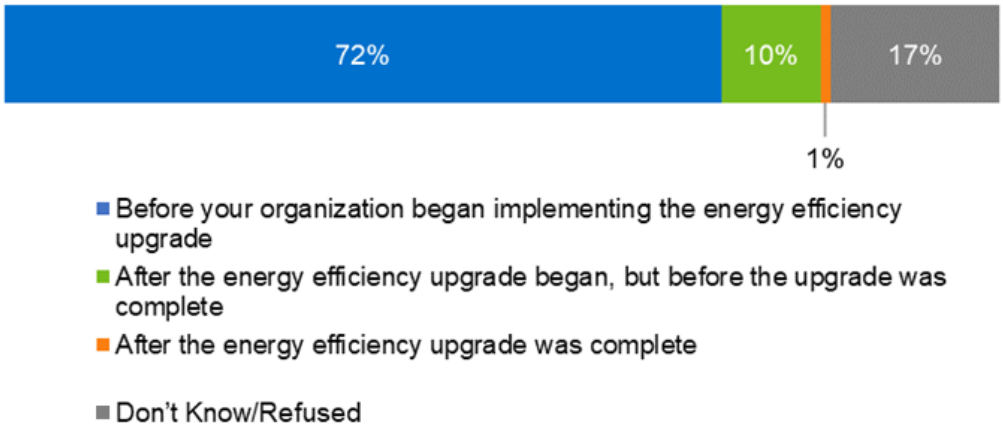
Figure 4-8: Actions Taken Prior to Learning of Program*



***Does not sum to 100% due to rounding.**

Participants were then asked about the timing of their application to the program in relation to the start of their lighting upgrades (Figure 4-9). Over four-fifths (82%) applied either before upgrading their lights or after the upgrades were underway but prior to their completion, indicating that most participants are applying to the program as intended. Only 1% of participants applied after all lighting upgrades were completed. As with the prior questions, participant responses to this question were not used to estimate the FR score but were intended to provide additional context for understanding their decision processes.

Figure 4-9: Timing of Program Application (n=205)



Respondents who applied to the SBL program after starting their lighting upgrades most commonly stated they did so due to time or resource constraints at their organization (21%), the need to find an immediate replacement for failed lighting (17%), or they needed to meet an internal deadline to complete the upgrades (17%) (Table 4-6). The responses suggest some of the respondents would have applied earlier if it had been possible for them to do so. Similar to the previous questions, this question was not used when calculating the FR score but provided additional context around participant intentions.

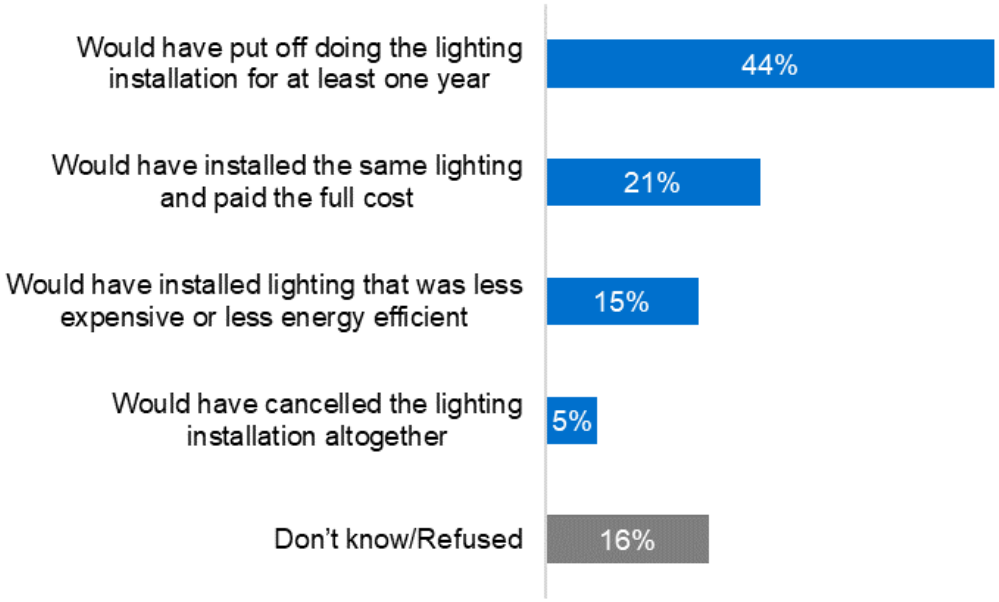
Table 4-6: Reasons for Beginning Installations before Applying (n=24)*

Reasoning	Respondents
Time or resource constraints at your organization	21%
Needed to complete work for an unplanned replacement for recently failed existing equipment	17%
Needed to stick to an internal schedule to complete upgrade	17%
Time needed to submit application through the program application system	13%
The company was interested in lowering its utility bills	8%
I wasn't yet aware of the SBL program	8%
Don't know/Refused	17%

***Does not sum to 100% due to rounding.**

Participants who stated they had planned for lighting upgrades before applying to the SBL program were then asked what their company would have done in the absence of the program's free audit and equipment installation (Figure 4-10). Overall, their responses suggest relatively low FR as almost two-thirds of participants (64%) would have put off or cancelled the upgrades or installed less expensive or less efficient lighting without the program's support. The remaining survey respondents would have either installed the same lighting equipment and paid the full cost themselves (21%) or were unsure of what they would have done (16%), which indicates partial or full FR for these respondents. The answers to this participant intent question were factored into the FR analysis.

Figure 4-10: Actions in Absence of Program (n=39)*



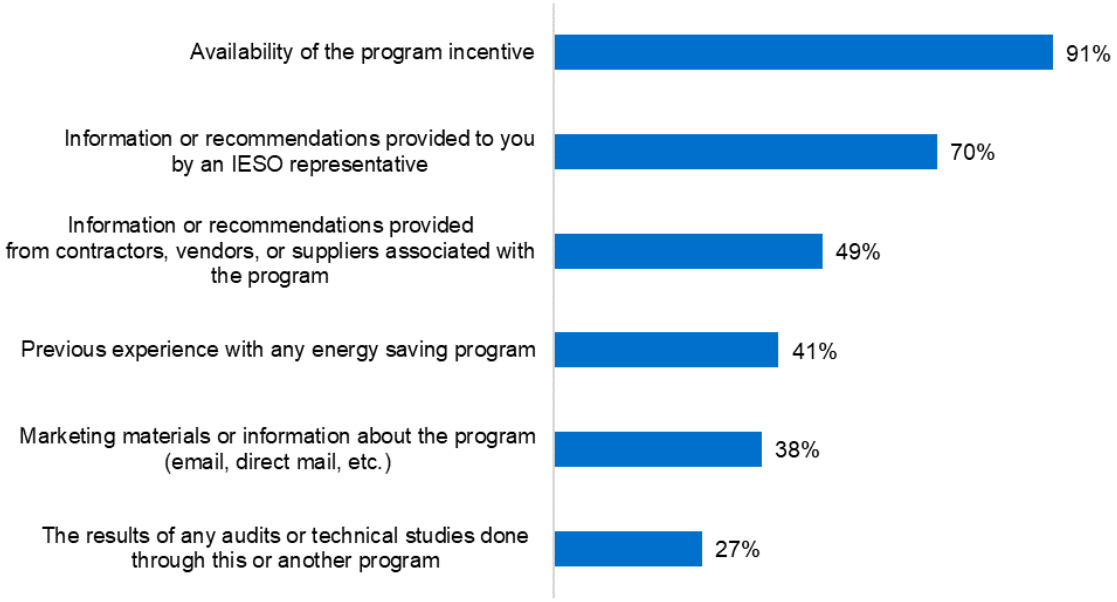
***Does not sum to 100% due to rounding.**

Respondents who indicated they would have installed less expensive or less energy-efficient lighting were then asked to describe how much they would have reduced the project's size, scope, or efficiency. Four of these respondents stated they would have reduced the size, scope, or efficiency by a moderate amount, while the other two respondents would have reduced it by a small amount. These results indicate that the program allowed these customers to increase their project's size and/or scope to a degree beyond what they might have achieved independently. This question was not used to calculate the FR score but is included to provide additional context around participant intentions.

Respondents who stated they would have installed the same lighting in the program's absence were asked to confirm that this was true and whether they would have paid for it themselves. All eight of these respondents confirmed that they would have done the same project and paid for it themselves, indicating high FR levels for these respondents. It should be noted that while these responses were used to estimate FR, these participants' scores constituted a small percentage of the total number of survey respondents and did not have a notable impact on the program's overall FR level.

Participants were asked how influential various program features were on their decision to install energy-efficient lighting (Figure 4-11). They rated each feature's influence on a scale from one (1) to five (5), where one indicates no influence at all, and five indicates it was extremely influential. Respondents gave the highest ratings to the availability of incentives (91% with a 4 or 5 rating) and the information or recommendations provided by an IESO representative (70% with a 4 or 5 rating). Respondents rated marketing materials and the results of audits or technical studies done through the SBL or other programs as the least influential (38% and 27% rating a 4 or 5, respectively). This suggests a necessity to assess how effectively the program is reaching customers with marketing materials and technical information.This question, which focuses on the program's influence, was used along with the prior questions about customer intentions to estimate the FR score.

Figure 4-11: Influence of Program Features on Participation (n=205)
(Rating of 4 or 5 on a scale from 1 to 5)



When participants were asked whether any other factors influenced their organization to install the energy-efficient lighting, the respondents' answers widely varied (Table 4-7). The most common factors were saving money on electricity bills (33%), saving energy/concern for the environment (24%), the appeal of better-quality lighting (20%), and the lack of cost to participate (10%).

Table 4-7: Other Influential Factors on Upgrade Decision*
(Open-ended and multiple responses allowed; n=67)*

Other Influential Factors	Respondents
Saving money on electric bill	33%
Energy/environmental concerns	24%
Better quality lighting/LEDs are better for employee health	20%
No cost to participate	10%
Ease of participation in the program	7%
Recommendation by other business owner/colleague	7%
Work was completed by experienced professionals	7%
Lighting improvements were needed	1%
Value to cost ratio was high for the lighting upgrades	1%
Bulbs need to be changed less frequently	1%
Flexibility of scheduling installation	1%
LDC recommendation	1%
Program allowed company to upgrade all lights at once	1%

***Does not sum to 100% due to rounding.**

In summary, the FR results among the SBL program participants indicate very low levels of FR (4% FR score). This low FR score, in combination with the other responses shown in this section, demonstrates that the program is generally reaching the participants who would not have made lighting upgrades without the program.

4.4.4 Spillover (SO)

To estimate SO, participants were asked if they installed any energy-efficient equipment for which they did not receive an incentive following their participation in the SBL program. Almost one-fifth (14%) of the participants reported installing new equipment.

Table 4-8 displays the types of non-incentivized equipment installed by companies after their SBL project was complete. Some survey respondents installed multiple types of equipment. Non-incentivized lighting was the most common equipment type installed (83%).

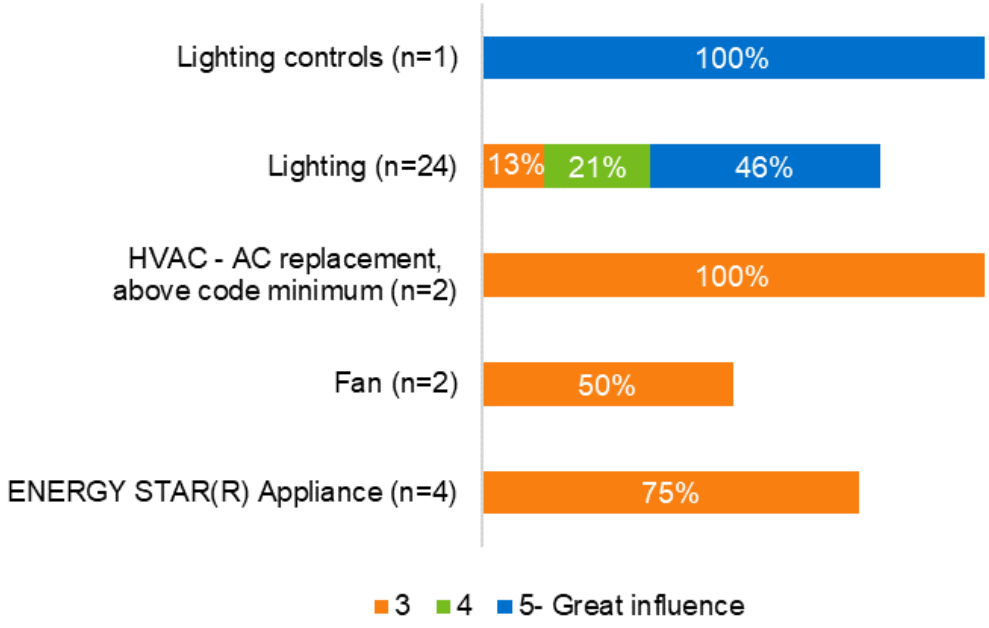
Table 4-8: Types of Upgrades Installed after Program Participation
(Multiple responses allowed; n=29)*

Type of Upgrades Installed	Equipment Installed
Lighting	83%
ENERGY STAR appliance	14%
Fan	7%
HVAC - air conditioner replacement, above code minimum	7%
Motor/Pump upgrade	3%
Lighting – controls	3%

***Does not sum to 100% due to rounding.**

Respondents were asked what level of influence their participation in the SBL program had on their decision to install this additional energy-efficient equipment. Participants rated the program's influence on a scale from one (1) to five (5), where one indicates the program had no influence at all, and five indicates the program was extremely influential. The percent of survey respondents influenced by the program (a score of 3 or higher) is shown in Figure 4-12 for each equipment type. All the respondents who installed ENERGY STAR appliances, HVAC replacements over code minimum, and lighting controls reported being influenced by the SBL program.

Figure 4-12: Program Influence on Equipment Installed outside the Program
(Multiple responses allowed)
(Rating of 3, 4, or 5 on a scale from 1 to 5)



Participants who had indicated that they installed the program-influenced non-incentivized equipment were asked a series of follow-up questions (for example, capacity, efficiency and annual hours of operation). These detailed questions are displayed in 10 and are used within the NTG algorithm to attribute SO savings to each equipment installation. SO savings were driven mainly by the installation of 192 new LED linear fixture upgrades completed by 14 respondents and 428 new linear fluorescent bulb upgrades completed by three respondents.

4.4.5 Rebound Effect

Respondents were asked a series of questions to determine whether any rebound effects occurred due to the lighting installations supported by the SBL program. These questions were not used to calculate the NTG score but instead were used to provide additional context about customer behaviors following the installation of the program-incentivized equipment.

There was little evidence of the rebound effect among most respondents. A small percentage of survey respondents (just over one in ten, or 11%) reported leaving their lighting on for extended periods after the upgrades. Lights were left on for an additional 4.1 hours per day, according to the respondents who provided valid feedback (13 respondents).

5. Process Evaluation

5.1 5.1 SBL IESO Program Staff and Program Delivery Vendor Staff Perspectives

The following subsections highlight the feedback received from the IESO program staff and the program delivery vendor staff.

5.1.1 Key Findings

Key findings from the IESO program staff and the program delivery vendor staff IDIs include the following:

- According to the IESO program staff, program delivery in 2019 was effective, and program targets were achieved despite the transition to a new framework and limited marketing.
- The program delivery vendor staff stated they were able to quickly and smoothly transition into their new role as the program's sole delivery vendor in 2019. They attributed this success to their experience as one of the program's vendors in prior program years and their strong relationships with their assessor staff and installer networks.
- The IESO program staff suggested considering broader or more varied marketing and outreach strategies to help the program to identify hard-to-reach customers in future program years.
- The program delivery vendor staff suggested that it will be important in future program years for the IESO and the program delivery vendor to effectively communicate about project completion rates and any relevant budget constraints.
- The program delivery vendor staff noted that a continued opportunity exists in future program years to build awareness with customers about the IESO's new role in administering the program.

5.1.2 Design and Delivery

For the 2019 SBL program, delivery was led by one program delivery vendor. The program's assessors are employed directly by the program delivery vendor, and the installers are often independent firms brought on to complete the lighting installations. The IESO program staff indicated that the program's delivery went well in 2019 despite the challenges associated with transitioning to the new framework.

The program delivery vendor staff indicated that the biggest change in program delivery of the 2019 SBL program was transitioning to a single program delivery model. In prior evaluation years, the program was delivered by multiple vendors for many different LDCs. Despite this structural change, the program delivery vendor staff emphasized they were able to smoothly transition to the new program delivery model given their prior experience with SBL programs and their well-established relationships with assessors and installers.

The program delivery vendor staff also stated they often use separate assessors and installers to avoid conflicts of interest when recommending measures. They have also adopted software and/or tablet-based approaches to automate program delivery as much as possible. For example, the application process consists of filling out a participation agreement on a tablet at the end of each assessment.

Program delivery vendor staff reported providing assessors and installers with quarterly or biannual training as needed. They also used e-mail and group text messages to update assessors and installers about program changes, receive feedback, and respond to the assessor or installer's questions.

5.1.3 Outreach Marketing

Beyond direct customer contact by the program delivery vendor and some limited social media and industry/community group outreach, broader marketing and outreach for the 2019 SBL program was limited. The IESO program staff reported that customer interest in the program was high, and the program delivery vendor had an effective customer targeting approach.

Given the program's limited budget, the program delivery vendor staff reported they did not request marketing support from the IESO in 2019 and independently led outreach and customer lead generation. Nearly three in four (70%) customer leads arose from outbound calls, another one in ten from inbound calls from customers, and the rest from door-to-door recruitment. Customers were also able to submit a form through the SBL website to register their interest and provided the program delivery vendor with some data points to initiate the eligibility screening process.

Looking forward, the program delivery vendor staff suggested that branded apparel for assessors and installers could help broaden marketing efforts related to the SBL program or the Save on Energy brand.

5.1.4 Barriers and Opportunities

The IESO program staff indicated that, overall, the program successfully met its targets in 2019 and effectively pivoted to a new delivery model without experiencing many barriers. However, they suggested that some customer segments might not be well represented, especially those who are hard-to-reach and who may, in turn, benefit most from the program's support. This suggests an opportunity to implement broader or varied marketing and outreach strategies to ensure all customers are engaged.

The program delivery vendor staff reported that while they completed many projects for the SBL program in the first half of 2019, due to budget constraints, the IESO had asked their team to slow down delivery starting in August of 2019. In response to this slowdown, some staff was laid off. They requested more forewarning and/or communication in future program years, when possible, about budgetary constraints that might require work slowdowns.

The program delivery staff also noted that the relationship between the IESO and the customer is not as defined as the relationship that the LDCs had in the past while delivering the program. Awareness of the IESO and its new role in delivering the program is likely still growing among some customers. Thus, there is a continued need and opportunity for the IESO and the program delivery vendor to build relationships with customers and remain sensitive to customer satisfaction.

Under the new delivery model, the program delivery vendor no longer receives the same detail in the customer participation data since the LDCs are no longer directly involved in the program. Additionally, under the prior set of program rules, small businesses were defined by how much energy they used. However, now, given that utility usage data is no longer available, the eligibility requirements have changed to be defined by the number of employees in the business. According to the program delivery vendor, this may be a less accurate method of determining qualifying participants. These factors have presented some program outreach and targeting challenges for the vendor. Nevertheless, they report that they are being creative and adaptable in their outreach strategies and have been able to effectively identify eligible participants.

5.2 SBL Assessor and Installer Perspectives

The following subsections highlight the feedback received from the assessor and installer survey.

5.2.1 Key Findings

Key findings from the assessor's and installer's responses include the following:

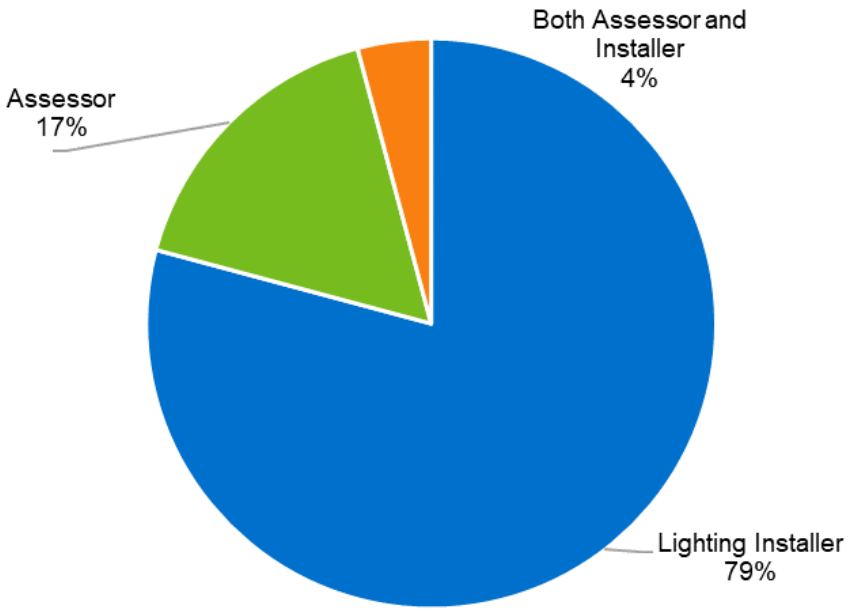
- A large majority of survey respondents (79%) were lighting installers.
- Many respondents received training related to the SBL program via webinars or online instruction (50%) or from one-on-one in-person instruction from the program delivery vendor (38%), while 13% indicated they did not receive program training.
- Respondents received training on a variety of topics, including program rules (71%), installation procedures and practices (63%), program offerings (54%), marketing and outreach techniques (46%), and the application process (33%).
- Almost two-thirds (63%) of respondents assume that customers participated in the SBL program after being informed by the program delivery vendor.
- When asked what prevented more customers from participating in the SBL program, 67% noted a key barrier was the lack of customer's knowledge about the program.

- Over two-thirds (67%) of respondents who had suggestions for program improvement mentioned a form of increased advertising (social media, bill inserts, online).
- Over two-thirds (67%) of respondents were completely or mostly satisfied with the overall program.
- Almost one-half (48%) of respondents reported their businesses had to temporarily close and/or reduce staff due to the COVID-19 crisis.

5.2.2 Firmographics

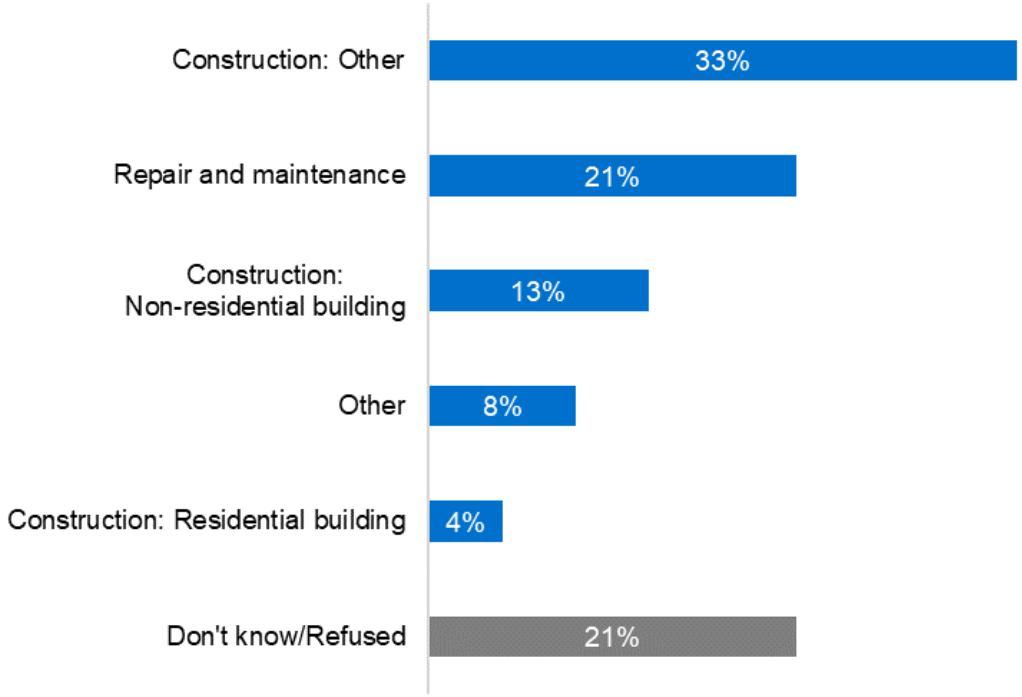
Respondents were asked various questions to better understand their roles in the SBL program. The majority (79%) of respondents reported being hired by the program delivery vendor, 4% reported being hired by the IESO, and 17% stated they were unsure how they became involved with the program. Nearly three-fourths (79%) of survey respondents were lighting installers, 17% were program assessors, and 4% were both an assessor and an installer (Figure 5-1).

Figure 5-1: Respondents' Company's Role(s) in the SBL Program (n=24)



One-half (50%) of respondents reported working for firms in the construction industry while under one-fourth (21%) work for firms performing repair and maintenance (Figure 5-2).

Figure 5-2: Respondents' Business Category
(Multiple responses allowed; n=24)



Most respondents worked at companies with 1 to 10 full-time employees (46%) and no part-time employees (54%) (Table 5-1).

Table 5-1: Respondents' Full- and Part-Time Employees (n=24)

Number of Employees	Full-Time	Part-Time
0	4%	54%
1-10	46%	25%
11-30	21%	0%
31-100	4%	0%
101+	4%	4%
Don't know/Refused	13%	8%

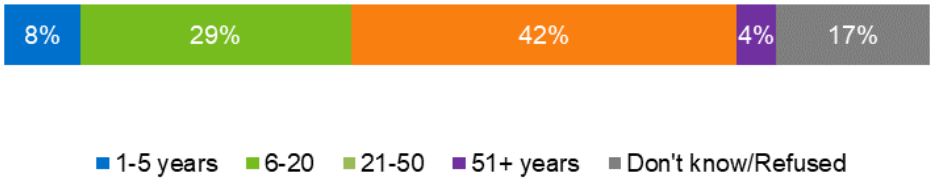
On average, respondents indicated that, including themselves, 5.5 staff members at their company provided services or support for the 2019 SBL program (Table 5-2).

Table 5-2: Staff Involved in 2019 (n=22)

Average	Median	Minimum	Maximum
5.5	5	1	16

Three-fourths (75%) of respondents worked at companies that have been in business for six years or more (Figure 5-3).

Figure 5-3: Respondents' Company's Age (n=24)



5.2.3 Project Background

Respondents were asked to provide background information about the projects they supported. Most respondents (67%) reported having previously performed assessments and/or installations for the SBL program under the Conservation First Framework (CFF), while 8% did not, and 25% were unsure if they had previously completed work for the SBL under the CFF.

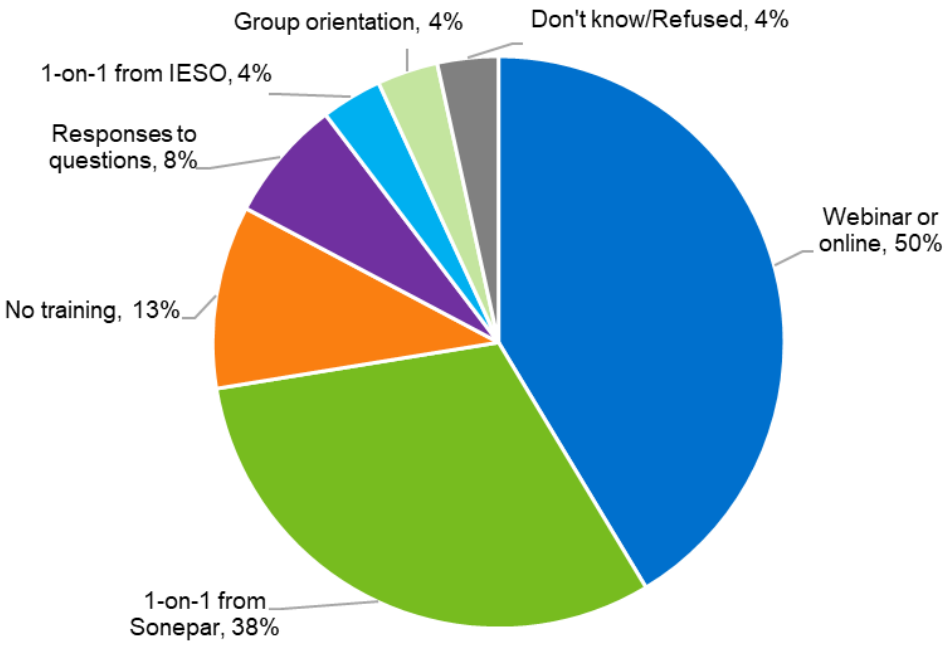
On average, in 2019 and as part of the Interim Framework (IF), assessors completed 384 assessments, and installers completed 175 projects.

Two responding installers provided an estimate for the percentage of their total sales represented by their 2019 SBL work. One installer indicated the program represented 80% of their total sales, and the other indicated it represented 85% of their total sales.

5.2.4 Training and Education

One-half (50%) of respondents received the SBL program training and education via a webinar or other online instruction. Almost two-fifths (38%) received one-on-one in-person instruction from the program delivery vendor, and 8% received clarifications to inquiries from the program delivery vendor or the IESO. Thirteen percent of respondents did not receive any training (Figure 5-4).

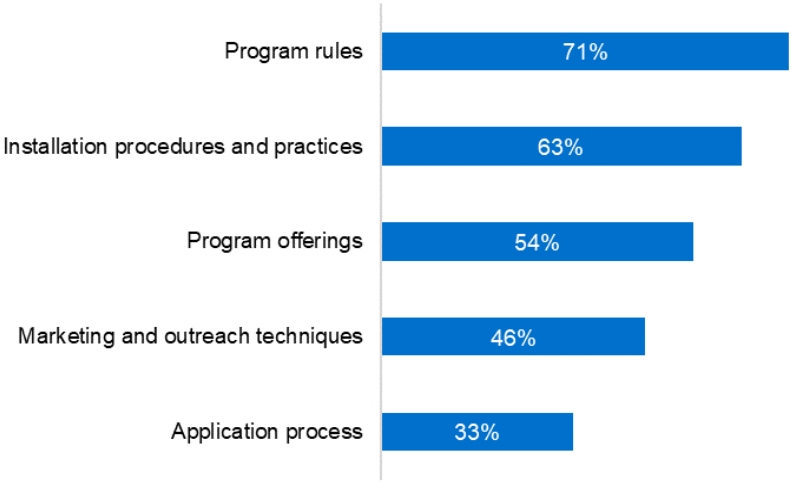
Figure 5-4: Type of Training and Education Received
(Multiple responses allowed; n=24)*



***Does not sum to 100% due to multiple responses.**

Of the 21 respondents who received training for the SBL program, roughly three-fourths (71%) received information on the program rules, close to two-thirds (63%) on installation procedures and practices, and over one-half (54%) on program offerings. Less than one-half (46%) of respondents were trained in marketing and outreach techniques, and one-third (33%) were trained in the application process (Figure 5-5).

Figure 5-5: Topics Covered in Training
(Multiple responses allowed; n=21)*

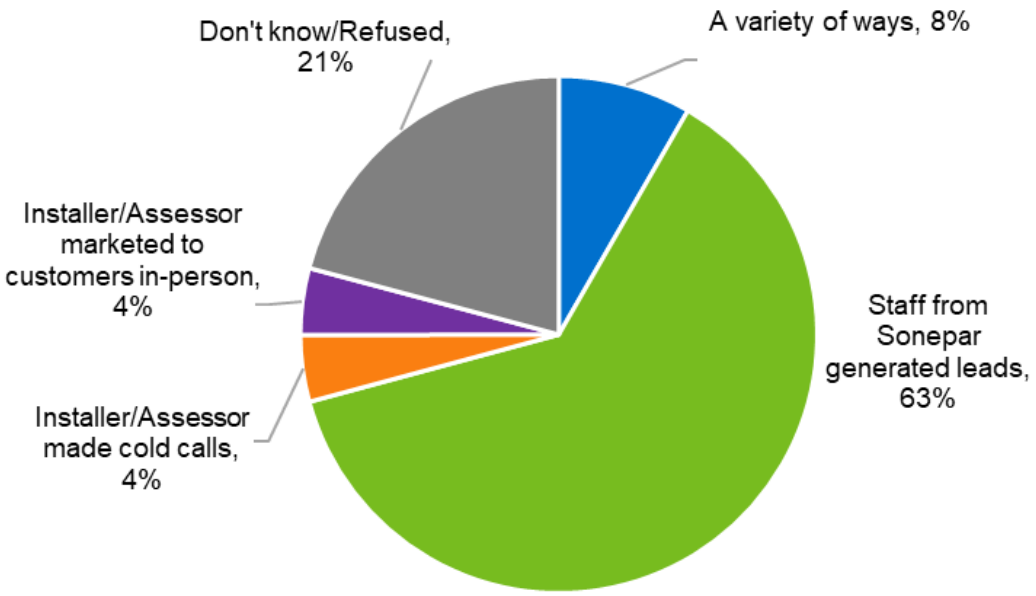


***Does not sum to 100% due to multiple responses.**

5.2.5 Customer Participation

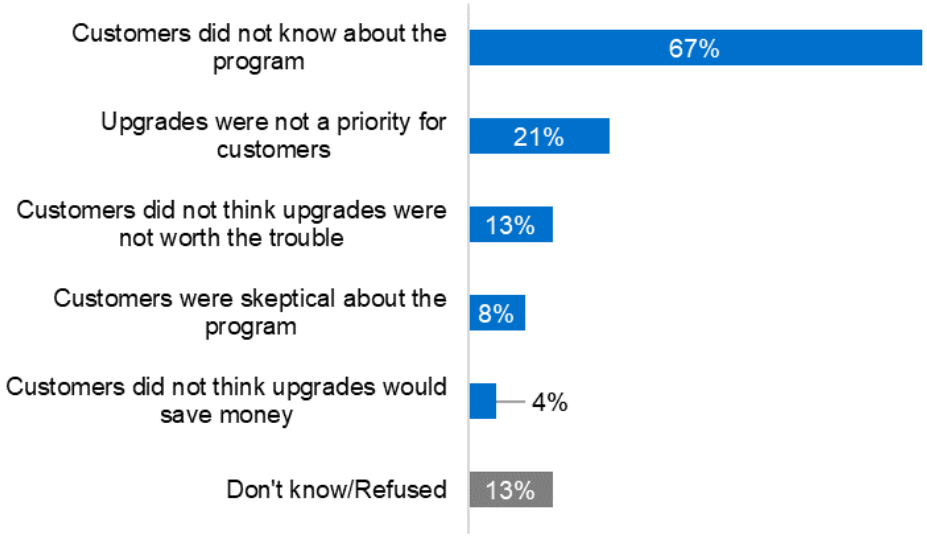
Almost two-thirds (63%) of respondents reported that their customers' primary method of participation in the SBL program was through customer leads generated by the program delivery vendor (Figure 5-6).

Figure 5-6: Primary Way Customers Came to Participate (n=24)



Over two-thirds (67%) of respondents indicated that customers being unaware of the program prevents them from participating. Other barriers include efficiency upgrades not being a priority for customers (21%), customers deeming the upgrades not worth the trouble (13%), overall skepticism about the program (8%), or customers believing the program would not save them money (4%) (Figure 5-7).

Figure 5-7: Barriers to Participation
(Open-ended and multiple responses allowed; n=24)*



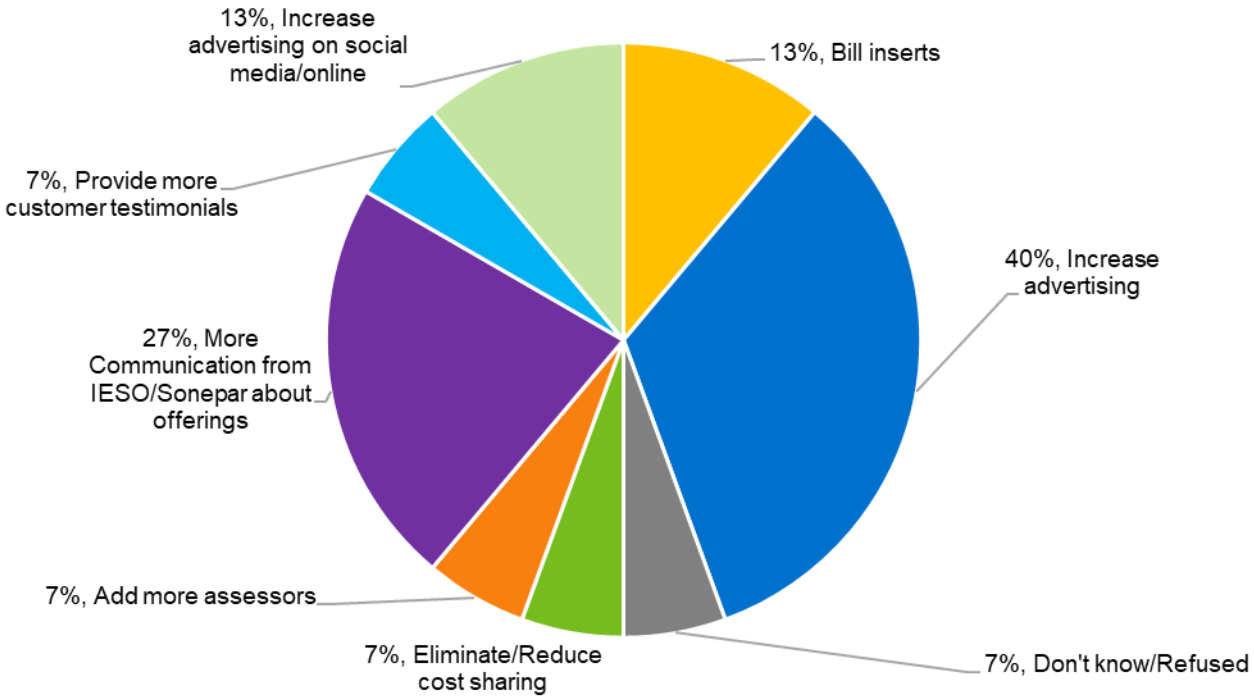
***Does not sum to 100% due to multiple responses.**

Close to two-fifths (38%) of respondents did not provide suggestions for addressing program participation barriers. As seen in Figure 5-8, of the approximately three-fifths (63%) of respondents who provided suggestions,

- Two-fifths (40%) mentioned increasing advertising in general,
- Over one-fourth (27%) mentioned it would be helpful to have more communication from the IESO or the program delivery vendor about the program offerings,
- Over one-tenth (13%) mentioned more social media/online advertisements, and
- Over one-tenth (13%) mentioned providing advertisements via bill inserts.

Overall, over two-thirds (67%) of respondents mentioned increasing advertising strategies to address the participation barriers.

Figure 5-8: Suggestions to Address Barriers to Participation
(Open-ended and multiple responses allowed; n=15)*

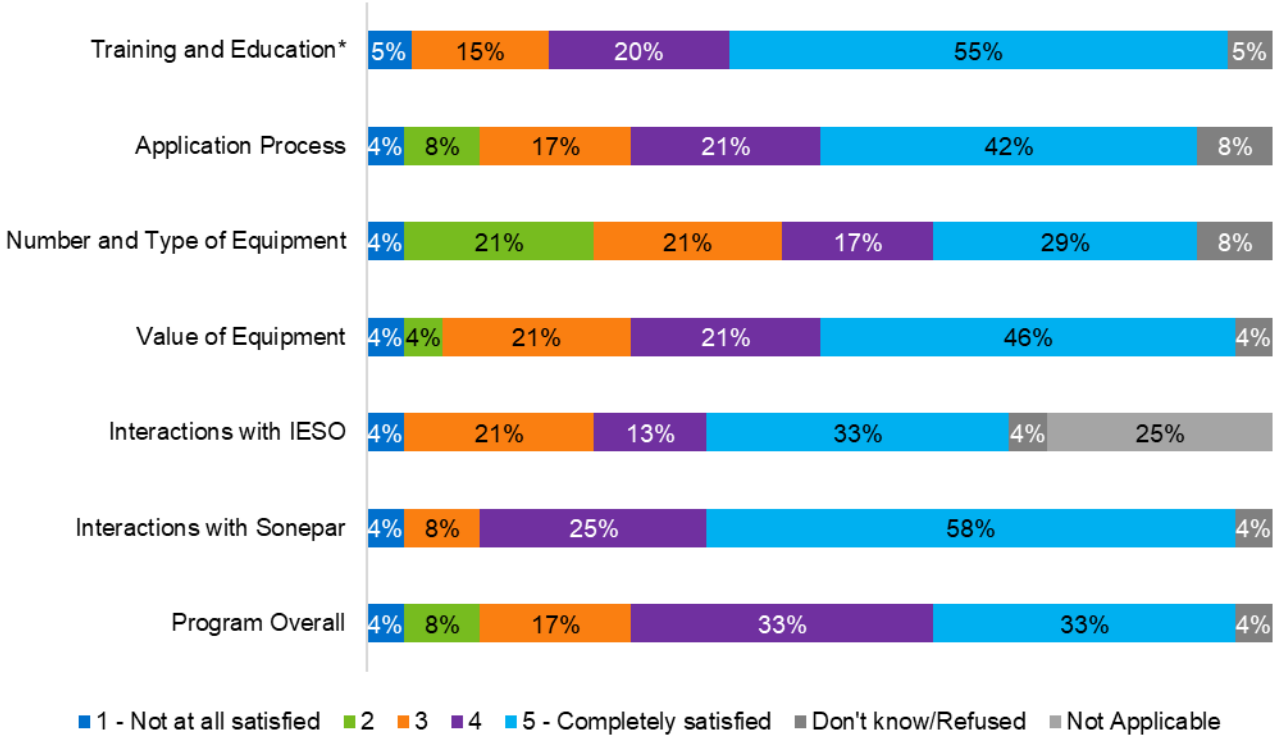


***Does not sum to 100% due to multiple responses.**

5.2.6 Program Satisfaction

Respondents provided feedback on their level of satisfaction with a variety of program aspects. Almost two-thirds (67%) of respondents were completely or mostly satisfied with the overall SBL program (Figure 5-9). Over four-fifths (83%) of respondents were completely or mostly satisfied with their interactions with the program delivery vendor staff, 75% with the training and education they received, 67% with the incentivized equipment's value, and 63% with the application process. Less than one-half (46%) of respondents were completely or mostly satisfied with the number of and types of equipment incentivized and their interactions with the IESO (46%).

Figure 5-9: Assessor and Installer Satisfaction (n=24)



***Respondent count for "Training and Education" is 20 since only respondents who indicated receiving training and education were asked to rate their satisfaction with it.**

5.2.7 Improvement Suggestions

Respondents were asked to suggest areas of improvement for the SBL program. Close to two-fifths (38%) of respondents did not provide suggestions. Of approximately three-fifths (63%) of respondents who did provide suggestions, over one-fourth (27%) suggested the program expand its lighting offerings to include outdoor lighting, signage lights, parking lot lighting, and 8' T12 and T8 tubes (Table 5-3). Other common responses included increasing the margin that the installers receive from completing the work (20%), improving the program for installers (for example, improve conditions and services) (13%), and reducing the reimbursement time for installers (13%).

Table 5-3: Areas for Improvement
(Open-ended and multiple responses allowed; n=15)*

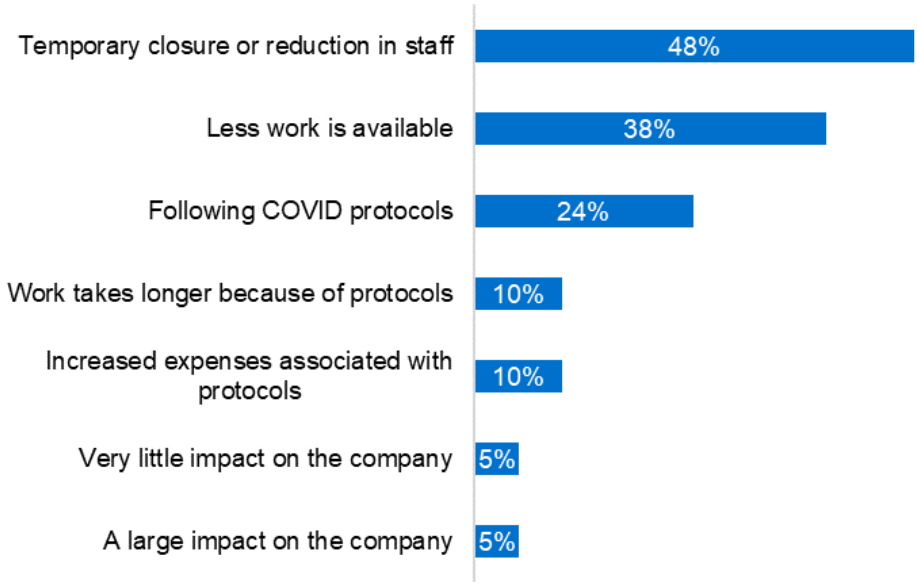
Suggested Areas of Improvement	Respondents
Expand lighting offerings	27%
Increase margins for installers	20%
Improve program conditions/services for installers	13%
Reduce the reimbursement time for installers	13%
Assessors provide more detail on work orders	7%
Combine SBL with other programs (e.g. HVAC)	7%
Eliminate/reduce cost sharing	7%
Include electric vehicle chargers among offerings	7%
Improve the implementer's lead generation and canvasing processes	7%
Increase advertising	7%
Increase product availability	7%

***Does not sum to 100% due to multiple responses.**

5.2.8 Business Response to the COVID-19 Crisis

Respondents were asked to describe how the COVID-19 crisis has affected their company and its operations, if at all. Just over one-tenth (13%) chose not to provide a response. Of the approximately four-fifths (88%) of respondents who provided feedback, close to one-half (48%) noted their business closed temporarily or reduced its staff at some point during the crisis. Close to two-fifths (38%) have seen less work become available, and about one-fourth (24%) explained they are following current COVID-19 protocols (Figure 5-10).

Figure 5-10: Changes to Business Operations due to COVID-19
(Open-ended and multiple responses allowed; n=21)



***Does not sum to 100% due to multiple responses.**

5.3 SBL Participant Perspectives

The following subsections highlight the feedback received from the participant survey.

5.3.1 Key Findings

Key findings from participants' responses include the following:

- A large majority of survey respondents had no suggestions for improving the initial site assessment (78%), the installer visit(s) (79%), or the overall installation process (84%). This suggests a high level of satisfaction with the program.
- Of those with suggestions for improving the site assessment, installer visit(s), or the overall installation process, the most common were to shorten the time it takes to complete the visits, improve the assessor or installer's professionalism, and provide more flexibility in scheduling the visits.
- Less than one in ten respondents (9%) reported disruptions to their business due to program upgrades.
- Nearly three-fourths (73%) of respondents had not applied to other energy-efficiency programs in 2019 besides the SBL program, and more than one-tenth (12%) had applied to the Retrofit program.
- More than two-fifths (41%) of respondents reported their businesses were very affected, seriously affected, and/or closed due to the COVID-19 crisis.

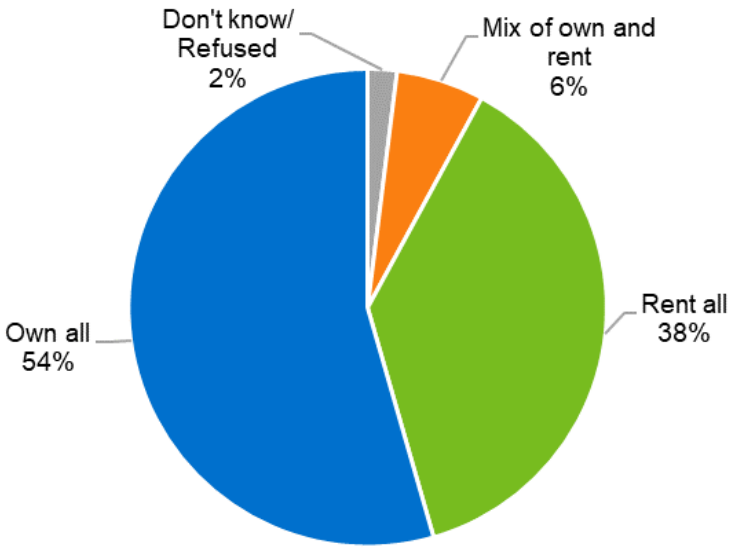
5.3.2 Firmographics

Participants were asked various questions to collect information on their job title, ownership status, and responsibilities in relation to the program. Detail on participants' companies (for example, primary activities, chain or franchise status, facility floor space, and whether the facility participated in other business programs) were also gathered during the survey.

Nearly two-thirds of survey respondents (65%) were owners or presidents of their companies, while about one-fifth (18%) were managers. Two-thirds (66%) were the primary employee responsible for the SBL lighting upgrades, and more than one-fourth (27%) had shared the responsibility.

Most (54%) participating companies owned the property where the program upgrades were conducted, but almost two-fifths (38%) rented the property (Figure 5-11).

Figure 5-11: Ownership Status (n=205)



The facilities served by the program were mainly in the retail and wholesale sector (31%) (Table 5-4). The next most common sectors were repair, maintenance, and operations (12%); lodging and food service (11%); and agriculture, forestry, husbandry, mining, and extraction (10%). Over nine out of ten respondents (91%) stated their company was not part of a franchise or chain.

Table 5-4: Primary Activity at Facility(ies)

(Multiple responses allowed; n=205)*

Primary Business Categories	Respondents
Retail and wholesale	31%
Repair, maintenance, and operations	12%
Lodging and food service	11%
Agriculture, forestry, husbandry, mining, and extraction	10%
Other services	10%
Non-profit	9%
Manufacturing	6%
Arts, entertainment, recreation, advertising, and travel	0.05
Finance, insurance, real estate, and property management	0.04
Healthcare services	4%
Construction	3%
Transportation and warehousing	3%
Government services	2%
Religious organization	0.01
Educational services	<1%
Scientific, technical, and information services	<1%

***Does not sum to 100% due to multiple responses.**

Participants were asked to provide the square footage of the project facilities. If multiple facilities received lighting upgrades, participants were asked to supply the total square footage for all of them (Figure 5-12). One-half (50%) of respondents stated the total square footage of their facility(ies) was between 1,001 and 5,000 square feet.

Figure 5-12: Total Square Footage for All Buildings (n=205)

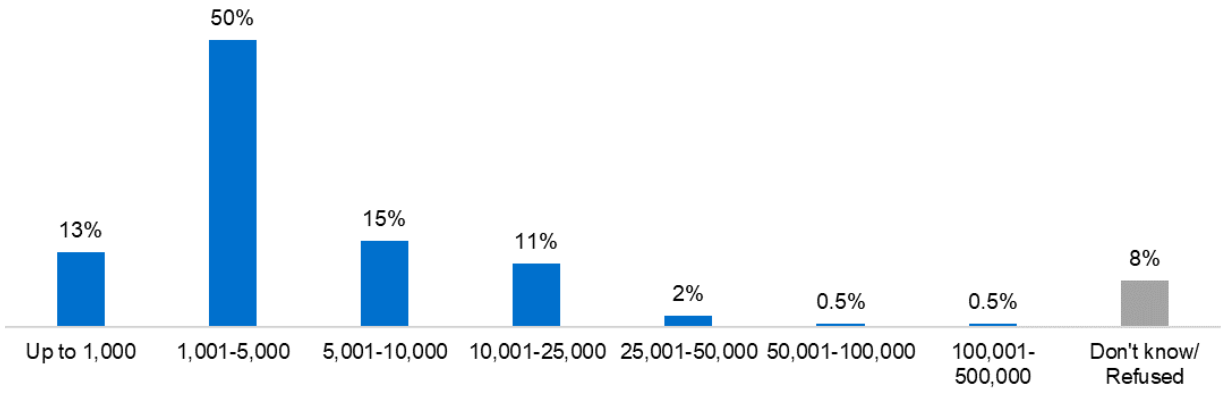


Table 5-5 shows the survey respondents' participation in other business programs offered by the IESO in 2019. Over one-tenth (12%) participated in the Retrofit program, and less than one in twenty (4.5%) participated in another program.

Table 5-5: Participation in Other Business Programs in 2019
(Multiple responses allowed, n=205)*

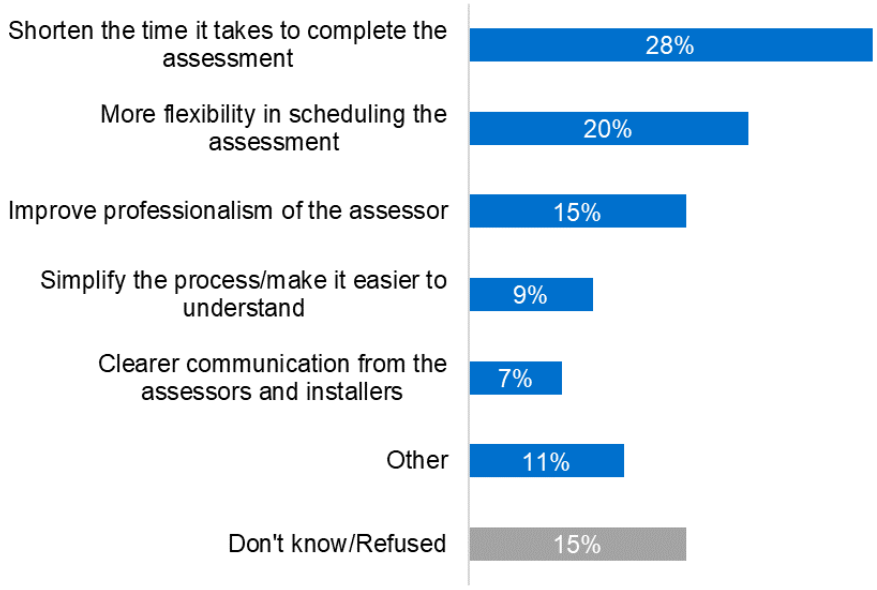
Other Programs	Percent Participated
Retrofit Program	12%
Refrigeration Efficiency Program	4%
Process and Systems Upgrades (PSU) Program	1%
Energy Manager Program	0%
Energy Performance Program	0%
Don't know/Refused	9%
No other programs	73%

***Does not sum to 100% due to rounding.**

5.3.3 Improvement Suggestions

Nearly four-fifths (78%) of respondents had no suggestions for improving the initial site assessment visit, indicating that a large majority were satisfied with the work done by their assessor. Of the one-fifth (22%) of respondents who had a suggestion, the most common responses given were to shorten the time it takes to complete the assessment (28%), provide more flexibility in scheduling the assessment (20%), and improve the assessor's professionalism (15%).

Figure 5-13: Suggestions for Improving the Initial Site Assessment Visit
(Open-ended and multiple responses allowed; n=46)*



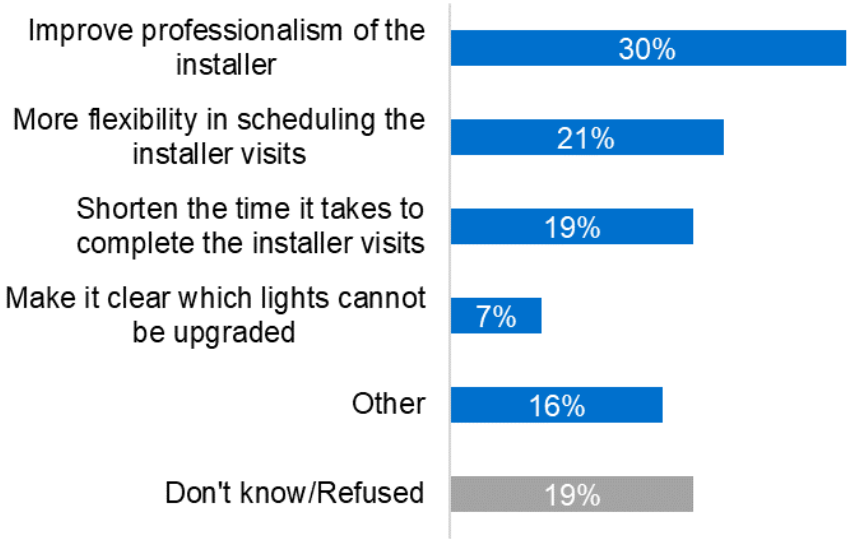
***Does not sum to 100% due to multiple responses.**

Participants who provided other suggestions for improving the initial site assessment visit mentioned the following:

- Include all buildings on the property (1 respondent)
- Enable an easier assessment scheduling process (1 respondent)
- Ensure the business owner does not have to take all the initiative to schedule the visit (1 respondent)
- Cover a variety of lighting types (1 respondent)
- Have the same staff perform assessment and installation (1 respondent)

Nearly four-fifths (79%) of respondents did not have suggestions for improving installer visits, indicating that a large majority were satisfied with the work performed by their installer. Of the one-fifth (21%) of respondents who had a suggestion, the most common responses given were to improve the installer's professionalism (30%), provide greater flexibility when scheduling the installer visit(s) (21%), and shorten the time it takes to complete the visit(s) (19%) (Figure 5-14).

Figure 5-14: Suggestions for Improving Program Installer Visits
(Multiple responses allowed; n=43)*



***Does not sum to 100% due to multiple responses.**

Participants who provided alternate suggestions for improving the program installer's visits mentioned the following:

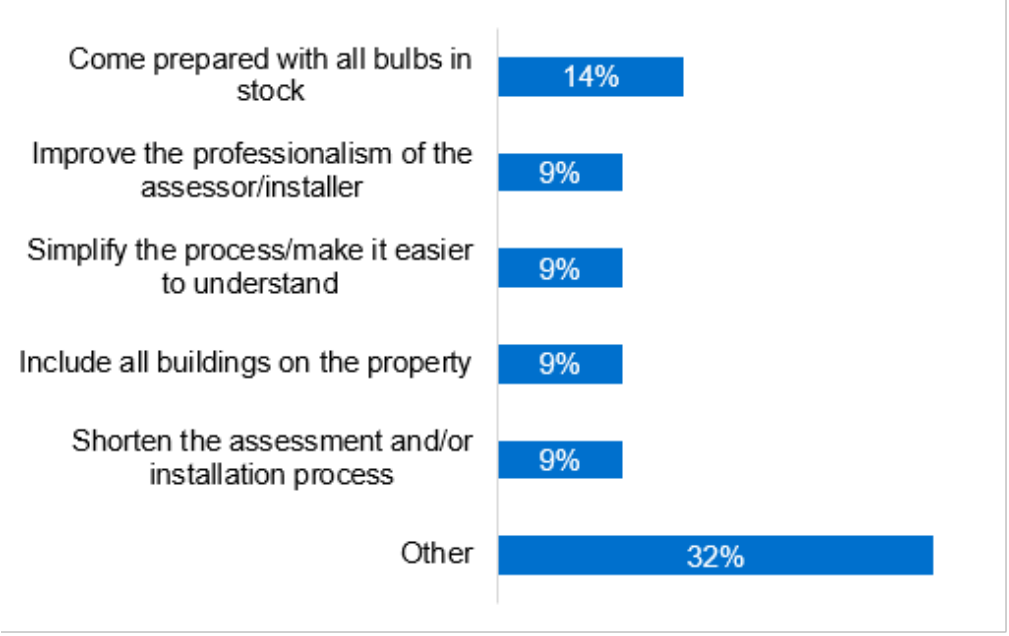
- Better communication between the assessor and installer (1 respondent)
- The installer should provide their own mechanical lift (1 respondent)
- Improve site cleanup (1 respondent)

- Ensure the installer does not damage property during installation (1 respondent)
- Make it clear that companies can choose their own installer (1 respondent)
- Shorten the time between the assessment and the installer visit (1 respondent)
- Simplify the process/make it easier to understand (1 respondent)

Over four-fifths (84%) of respondents did not have suggestions for improving the overall installation process, indicating a high level of satisfaction with the program. As seen in Figure 5-15, of the less than one-fifth (15%) of respondents who had a suggestion, the most common responses were to:

- Require installers to come prepared with all bulbs in stock (14%),
- Improve the assessor or installer's professionalism (9%),
- Simplify the process or make it easier to understand (9%),
- Include all buildings on the property (9%), and
- Shorten the assessment and/or installation process (9%).

Figure 5-15: Suggestions for Improving the Overall Installation Process
(Open-ended and multiple responses allowed; n=22)*



***Does not sum to 100% due to multiple responses.**

Participants who provided other suggestions for improving the overall installation process mentioned the following:

- Better communication between the installer and assessor (1 respondent)
- Enhanced communication from the program as a whole (1 respondent)
- Able to work around the participant's schedule (1 respondent)

- Ensure proper installations (1 respondent)
- Clearly state the cost of upgrades (1 respondent)
- The program should cover lighting fittings (i.e. all of the fixtures, features, and elements of the light) (1 respondent)
- Use local installers (1 respondent)

Almost nine in ten respondents (87%) mentioned there were no disruptions to their business as a result of the program installation. As seen in Table 5-6, of the less than one-tenth (9%) of respondents that experienced a disruption, the most common disruptions mentioned were:

- Needing to schedule their business' regular activities around the assessor and installer appointments (four respondents),
- Installers or assessors arriving late (two respondents),
- Having to close for appointments (two respondents), and
- Requiring multiple visits to complete the installation (two respondents).

Table 5-6: Disruption to Business Operations Due to the Small Business Lighting Program
(Open-ended and multiple responses allowed; n=16)

Disruptions to Business	Respondents
Company needed to schedule business around appointments	4
Assessor/installer arrived later than promised	2
Business needed to close for appointments	2
Multiple visits needed to complete installation	2
Appointments were disruptive to customers	1
Appointments were scheduled on short notice	1
Assessor/installer needed to reschedule several times	1
Fixtures needed to be reinstalled	1
Lighting started malfunctioning within months, installers may have cut corners	1
Provided lifts at company expense	1

***Counts displayed rather than percentage due to small n.**

5.3.4 Business Response to the COVID-19 Crisis

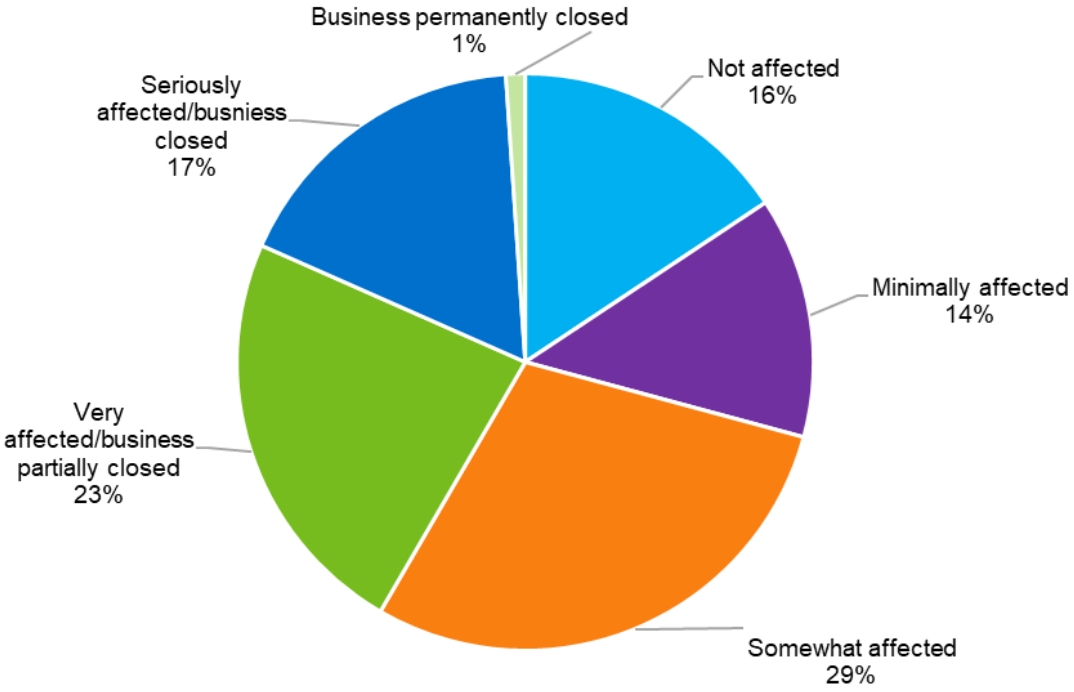
Respondents were asked an open-ended question about how the COVID-19 crisis had impacted their company and its operations (Figure 5-16). They reported widely different effects from the COVID-19 pandemic. The range contained answers that included:

- Not affected,
- Minimally affected (increased PPE or started working from home),
- Somewhat affected (lost revenue),

- Very affected/business partially closed (a restaurant moving to a takeout-only model),
- Seriously affected/business closed (the entire business was closed for weeks or months), and
- Business permanently closed.

More than two-fifths (41%) of respondents reported their businesses were very affected, seriously affected, and/or closed due to the COVID-19 crisis.

Figure 5-16: Impacts to Business Operations of COVID-19
(Open-ended and multiple responses allowed; n=185)



6. Job Impacts Assessment

This section presents the job impact analysis results, which are summarized in Table 6-1. As the two right columns indicate, the analysis estimated that the SBL program created 234 jobs in Canada, with 204 jobs created specifically in Ontario. Of the 234 estimated total jobs, 107 were direct jobs, 76 were indirect jobs, and 51 are induced. In terms of FTEs, the numbers are slightly less, with 168 FTEs created in Ontario and 192 FTEs created nation-wide. Of these 192 FTEs, direct jobs account for 92 FTEs, 60 FTEs are indirect jobs, and 40 FTEs are induced. In total, the SBL Program created 27.1 jobs per million dollars of investment (program budget).

Table 6-1 : Summary of Total Job Impacts

Job Impact Type	Ontario FTE (person-years)	Nation-wide FTE (person-years)	Ontario Total Jobs (person-years)	Nation-wide Total Jobs (person-years)	Total Jobs per $1M Investment (person-years)
Direct	86	91	102	107	12.4
Indirect	51	61	60	76	8.8
Induced	31	40	42	51	5.9
Total	**168**	**192**	**204**	**234**	**27.1**

Section 6.1 details the values of the inputs used in the model runs. Section 6.2 presents the analysis results, including details of job impacts and assumptions.

6.1 Inputs

The IO model was used to estimate the impacts of three economic shocks—one representing the demand for energy-efficient products and services from the SBL program, a second from the increased business reinvestment due to bill savings (and net of project funding), and a third from the residential portion of program funding. Table 6-2 below shows the demand shock's input values representing the products and services related to the SBL program. Each measure installed as part of the program was categorized according to the StatCan IO Supply and Use Product Classifications (SUPCs).

The first two rows of Table 6-2 contain the categories corresponding to products, which were the measures installed in businesses, and the last row contains the services. Lighting fixtures had the highest total cost of the two product categories and accounted for $6.0 million of the overall program cost. Electric light bulbs and tubes had $1.1 million of the total cost. The similarities of the product categories reflect the relatively narrow range of measures typically installed as a part of the SBL program compared to other programs such as Commercial Retrofit. Each measure's cost was divided into labour and non-labour, as this was required by the IO Model to distinguish between direct versus indirect impacts. The SBL installations were relatively straightforward—mainly with direct lamp replacements requiring approximately 1-2 hours to install. The average project cost for 2019 was $1,590. Assuming a rate of $50 per hour for a journeyman to perform the installation, the labour cost would be around $100, or 6 percent of the project cost. This estimate was used as the labour portion for the model input.

The single service category in Table 6-2, Office administrative services, included general overhead and administrative services associated with program delivery. The labour and non-labour amounts are not specified for this category, as the IO Model includes built-in assumptions.

Table 6-2: Summary of Input Values for Demand Shock

Category Description	Non-Labour ($ thousands)	Labour ($ thousands)	Total Demand Shock ($ thousands)
Lighting fixtures	5,634	379	6,013
Electric light bulbs and tubes	1,053	71	1,123
Subtotal	**6,687**	**450**	**7,136**
Office administrative services	-	-	2,340
Total			**9,476**

The second shock modelled by the IO Model was the business reinvestment shock. This shock represented the amount that businesses would reinvest and thus inject back into the economy. The net amount that businesses have available to either reinvest, pay off debt, or distribute to owners/shareholders ($38.7 million) was the net of electricity bill savings (NPV = $39.5 million). The portion of SBL program costs is not covered by incentives ($0.8 million). The portion of this $38.7 million that was to be reinvested was estimated using the surveys administered to participants as part of the SBL process evaluation. The surveys included several questions about what businesses would do with the money they saved on their electricity bills, as well as the type of business. Overall, respondents indicated that 70 percent of bill savings would be reinvested ($27.1 million). The remaining savings would either be used to pay off debt or disbursed to owners/shareholders.

To properly model the business reinvestment shock effects, the IO Model required the reinvestment estimates by industry. Each industrial category has a production function in the model, and these functions were adjusted to account for the reinvestment shock. Table 6-3 shows the input values for the business reinvestment shock by industry. The total business expenditure shock would be $27.1 million over 19 industries, as shown in the table.

Table 6-3: Summary of Input Values for Business Reinvestment Shock

Category Description	Business Reinvestment Shock ($ thousands)
Retail Trade	6,666
Other services (except public administration)	2,913
Crop and animal production	2,903
Accommodation and food services	2,657
Non-profit institutions serving households	1,989
Manufacturing	1,909
Arts, entertainment and recreation	1,718
Repair, maintenance and operating and office supplies	1,527
Finance, insurance, real estate, rental and leasing and holding companies	1,226
Transportation and warehousing	668
Health care and social assistance	613
Other municipal government services	517
Professional, scientific and technical services	382
Wholesale trade	382
Repair construction	286
Educational services	191
Non-residential building construction	191
Other activities of the construction industry	191

Category Description	Business Reinvestment Shock ($ thousands)
Owner occupied dwellings	191
Total	**27,119**

The third model input is the household expenditure shock.[8] This shock represents the incremental increase in electricity bills to the residential sector from funding the program. The assumption is that all customers fund the IESO programs in proportion to the overall electricity consumption. Thus, the residential funding portion was 35 percent of the $8.6M program budget, or $3.0M.

6.2 Results

The StatCan IO Model generated results based on the input values detailed in Section 6.1. Table 6-4 shows the results of the model run for the demand shock for products and services. This shock accounted for approximately 30 percent of job impacts. As the two right columns show, the model estimated that the demand shock resulted in the creation of 69 total jobs (measured in person-years) in Canada, of which 61 were in Ontario. Of the 69 jobs, 25 were direct, 29 indirect and 15 induced. In terms of FTEs, the numbers are slightly lower. A total of 50 FTEs were estimated to be created in Ontario and 56 in total nation-wide. Of those 56 FTEs, 21 were direct, 24 indirect and 11 induced. Direct job impacts were realized exclusively in Ontario, as shown in the table. Indirect and induced job impacts displayed some dispersion outside of the province.

Table 6-4 : Job Impacts from Demand Shock

Job Impact Type	Ontario FTE (person-years)	Nation-wide FTE (person-years)	Ontario Total Jobs (person-years)	Nation-wide Total Jobs (person-years)
Direct	21	21	25	25
Indirect	19	24	24	29
Induced	10	11	12	15
Total	**50**	**56**	**61**	**69**

Table 6-5 shows the results of the model run for the business reinvestment shock. Job impacts generated by business investments were equal to 74 direct FTEs and 89 direct jobs in Ontario. Overall, business investments were responsible for 79 FTEs and 94 total jobs across Canada.

[8] The model is actually run with a normalized value of $1 million in extra household expenditures and the job results can be scaled by the actual demand shock.

Table 6-5 : Job Impacts from Business Reinvestment Shock

Job Impact Type	Ontario FTE (person-years)	Nation-wide FTE (person-years)	Ontario Total Jobs (person-years)	Nation-wide Total Jobs (person-years)
Direct	74	79	89	94
Indirect	35	43	42	53
Induced	24	32	33	42
Total	**133**	**154**	**164**	**189**

The third shock was the reduction in household spending from the increase in electricity bills to fund the program. Table 6-6 presents the number of job impacts from the model, representing the number of jobs attributed to reduced household spending. This amount could have been spent in other sectors of the economy, but instead was spent on funding the SBL program. The model estimates a reduction of 18 FTEs and 24 total jobs across Canada due to the decreased household spending.

Table 6-6 : Job Impacts from Residential Funding Shock

Job Impact Type	Ontario FTE (person-years)	Nation-wide FTE (person-years)	Ontario Total Jobs (person-years)	Nation-wide Total Jobs (person-years)
Direct	-9	-9	-12	-12
Indirect	-3	-6	-6	-6
Induced	-3	-3	-3	-6
Total	**-15**	**-18**	**-21**	**-24**

Other factors included in the research questions were the impact of program funding on the non-residential sector and the impact of reduced electricity consumption. The StatCan IO Model does not adjust production functions for all industries experiencing marginally higher electricity price changes. This portion of the shock is modelled by assuming that surplus would be reduced by the extra amount spent on electricity. The model captures energy bill increases from program funding as an impact on direct GDP (value-added) and not as a reduction in employment. The GDP impact is equivalent to the profit loss resulting from the increase in electricity bills from program funding.

The economic impact of the reduction of electricity production as a result of the increase in energy efficiency was another potential economic shock. Technically speaking, it can be estimated using StatCan Input-Output multipliers without running the model. However, the IO model is linear and not well suited to model small decreases in electricity production. Total electricity demand has been increasing over time and is projected to continue increasing[9]. The SBL first year energy savings represented 0.02 percent of total demand in 2019. This relatively small decrease in overall consumption may slow the consumption growth rate over time. Nevertheless, it would likely not result in actual job losses in the utility industry or upstream suppliers. The IO model's linearity indicates that it will provide estimates regardless of the size of the impact. Given the nature of electricity production, it is reasonable to conclude that the linear IO multiplier is not appropriate for estimating job impacts. This analysis assumes that job losses from decreased electricity production are negligible.

Table 6-7 shows the total estimated job impacts by type, calculated by combining the jobs estimated in Table 6-4, Table 6-5 and Table 6-6. Of the 107 estimated total direct jobs, 102 were in Ontario. Smaller proportions of the indirect and induced jobs were in Ontario; 60 out of 76 indirect jobs and 42 out of 51 induced jobs were estimated to be created. The FTE estimates were slightly lower overall than the total jobs, with 168 FTEs (of all types) created in Ontario and 192 FTEs added nationwide. Almost all direct FTEs (86 of 91) were in Ontario, representing approximately 50 percent of the province's FTEs.

Table 6-7 : Total Job Impacts by Type

Job Impact Type	Ontario FTE (person-years)	Nation-wide FTE (person-years)	Ontario Total Jobs (person-years)	Nation-wide Total Jobs (person-years)	Total Jobs per $1M Investment (person-years)
Direct	86	91	102	107	12.4
Indirect	51	61	60	76	8.8
Induced	31	40	42	51	5.9
Total	**168**	**192**	**204**	**234**	**27.1**

[9] Annual Planning Outlook – A view of Ontario's electricity system needs; 2020. IESO.

Table 6-8 shows the job impacts in more detail, with jobs added by type and industry category. Industries are sorted from top to bottom by those with the most impacts to the least, with industries that showed no impacts not included in the table. The table shows that the industry with the largest job impacts was non-residential building construction. Administrative and support, waste management and remediation services added the second-most jobs with a total of 36 across Canada; retail trade was third with 26 total jobs added.

Table 6-8: Job Impacts by Industry

Job Impact Type	Ontario FTE (person-years)	Nation-wide FTE (person-years)	Ontario Total Jobs (person-years)	Nation-wide Total Jobs (person-years)
Non-residential building construction	35	35	43	43
Administrative and support, waste management and remediation services	27	29	34	36
Retail Trade	18	20	24	26
Manufacturing	15	22	16	23
Professional, scientific and technical services	13	17	17	22
Wholesale trade	16	19	17	20
Finance, insurance, real estate, rental, and leasing and holding companies	9	11	12	14
Transportation and warehousing	5	7	6	8
Accommodation and food services	3	4	5	6
Engineering construction	5	5	5	5
Information and cultural industries	3	4	4	5
Other services (except public administration)	2	3	4	5
Government education services	3	3	4	4
Residential building construction	3	3	4	4
Repair construction	2	2	2	2
Health care and social assistance	1	1	2	2
Arts, entertainment and recreation	1	1	1	2
Other federal government services	1	1	1	1
Crop and animal production	1	1	1	1

Job Impact Type	Ontario FTE (person-years)	Nation-wide FTE (person-years)	Ontario Total Jobs (person-years)	Nation-wide Total Jobs (person-years)
Other municipal government services	1	1	1	1
Educational services	0	0	1	1
Non-profit institutions serving households	1	1	1	1
Mining, quarrying, and oil and gas extraction	0	1	0	1
Utilities	1	1	1	1
Government health services	0	1	1	1
Total	**168**	**192**	**204**	**234**

[1] **Columns may not add to totals due to rounding. Real values are rounded to the nearest whole number and the whole numbers do not sum exactly to the whole number total in every column.**

The SBL Assessor and Installer survey responses contained job-impact related questions for auditors and contractors related to the SBL program's impact on their firms and employment levels. In particular, two questions were informative in understanding the nature of the impacts to respondents, which would be considered direct impacts. These two questions are below, with relevant illustrative verbatim survey responses included:

1. Did the 2019 SBL Program help or hinder the growth of your business in any way? If so, please explain how:

The program helped the growth of my business in the following ways:

- "Allowed us to implement teams dedicated to lighting installations; Increased revenue."
- "I am able to assist customers in other energy-saving areas."
- "For several years, it has helped our company meet new customers and helped us with repeat business with them."

The program hindered the growth of my business in the following ways:

- "Sometimes, a customer would need other services and ask us while we are there or ask us if we could perform a job at a later time. But for the most part, most of these small businesses don't tend to want to spend extra money. A lot of small businesses struggle with the financial side, so it does not bring a lot of extra work."

2. Did the 2019 program have an impact on the people you hired in the last year? Yes, the program impacted the number of people hired in the last year in the following ways:

Positive:

- "The program keeps existing employees busy during 'quiet times' at our company, which stops temporary layoffs."
- "More work."

Negative:

- "Yes, I had to lay them off."

Respondents provided generally positive responses regarding the program's ability to retain existing or hire additional employees. For the most part, the direct job gains estimated by the model are supported by these responses, which reveal the nature of the actual impact on firms. In particular, respondents stating that positive impacts were derived from program activities stated that the program helped buoy businesses during historically slower times of the year, allowing retention of employees who would otherwise have been furloughed. A further investigation into negative responses could help determine regions or business sectors that experience negative impacts of the program or areas of program improvement, should an increase in job impacts be desired.

Input-Output models are informative for understanding the potential magnitudes and dynamics of economic shocks created by policies and programs. While useful, the StatCan IO Model is a simplified representation of the Canadian economy and has limitations. The model is based on the assumption of fixed technological coefficients. It does not consider economies of scale, constraint capabilities, technological change, externalities, or price changes. This makes analyses less accurate for long-term and large impacts, where firms would adjust their production technology and the IO technological coefficients would become outdated. Assuming that firms adjust their production technology over time to become more efficient implies that the impact of a change in the final demand will tend to be overestimated. For household consumption, the model is based on the assumptions of constant consumption behaviour and fixed expenditure shares relative to incomes. It is useful to compare IO model analyses conducted using the same model to understand impact estimates with a similar set of assumptions. Job impacts were also estimated for the Retrofit program using the StatCan IO Model. The SBL program budget was $8.6 million and generated 234 total jobs, while the Retrofit program had a budget of $5.2 million and generated 151 total jobs. SBL thus yielded one job per $37,000 of program budget (27 jobs/$M), compared to one job per $34,000 of program budget (29 jobs/$M). The Retrofit program catalyzed more spending on EE projects by participants ($3.1M) than the SBL program ($850,000). The SBL program, however, yielded greater bill savings, and thus, more reinvestment, leading to more jobs from the reinvestment shock. A 2011 study on the impacts of a set of hydropower investments in Canada[10] used the StatCan IO Model found that a $128 billion investment could yield slightly more than 1 million jobs. This equates to $123,000 in spending per job (8 jobs per $M). This suggests that EE programs like Retrofit and SBL can create jobs 3-4 times more cost-seffectively than this particular investment in hydro power.

[10] Desrochers, R. et al.; (2011). Job Creation and Economic Development Opportunities in the Canadian Hydropower Market. Canadian Hydropower Association.

7. Findings and Recommendations

Finding 1: SBL Assessment Tool (Hours of Operation)

The 2019 SBL Program Assessment Tool used by the assessors and installers collects parameters necessary to calculate energy and demand savings and is simple to use. The evaluator understands that it is important not to complicate the Assessment Tool. Nevertheless, discrepancies between the operating schedules reported on the application and those verified in the field contribute significantly to the realization rates being less than 100%. Currently, the Assessment Tool only accepts one schedule for the entire facility and only accepts schedule inputs in terms of a weekly schedule, which is assumed to be constant over the entire year.

> ***Recommendation 1:*** Nexant recommends to upgrade the existing Assessment Tool and allow for the creation of multiple schedules for the same facility, where measures can be properly assigned to their respective operating schedules. Additionally, allow the users to highlight the varying operation –seasonality– of the facility if any.
> Alternatively, if there is a need to maintain the current Assessment Tool design, Nexant recommends that clear instructions be provided to the assessors on what hours of operation should be entered in the SBL Assessment Tool. It should be clarified that the schedule entered in the hours of operation fields should be the hours that the new efficient lamps are expected to operate and not the hours of operation of the business. In many instances, the hours the business is open to the public are entered into the SBL Assessment Tool when in fact, the lights are turned on when the business is closed to the public, or some lights might be off during part of the business hours. Another option is to clarify in the Assessment Tool instructions and contractor training that in cases where multiple schedules exist, the schedule entered should be for the lights expected to generate most of the energy savings.

Finding 2: SBL Assessment Tool (Reported Demand Savings)

The 2019 SBL program reported demand savings reflect a change in connected load and are not adjusted for peak coincidence. The IESO requires calculating net verified savings based on the summer peak demand definition.

> ***Recommendation 2:*** The 2019 SBL Assessment Tool collects actual hours of operation data for each assessed facility. Nexant recommends utilizing this data to calculate the corresponding portion of the change in the connected load that occurred during the peak window, or the peak coincidence factor (CF) of each project. This would help to report summer peak demand savings accurately.
> Alternatively, if there is a need to maintain the current Assessment Tool design, Nexant recommends using a predefined peak coincidence factor (CF) based on 8760 load shapes available in IESO's MALs and libraries.

Finding 3: Improved Baseline and Retrofit Photos

Photos of the pre-existing baseline and retrofitted fixtures and lamps are available as part of the project files provided by the program delivery vendor. These photos are important and helpful when verifying the baseline and retrofit measure types and wattages. In most cases, the photos submitted were taken from wide angles and from a few feet away, which does not provide useful information about the lamp wattage or lamp type. There were only a few instances where the photos captured sufficient detail of the lamps or fixtures to definitively determine the wattages.

> ***Recommendation 3:*** Specify what information should be captured in the pre-retrofit and post-retrofit pictures taken by the SBL assessors/installers. Specify that pictures of the replaced equipment should capture the lamp's wattage and, if applicable, the ballast type. This is specifically critical for direct install programs since the participants of such programs often do not possess sufficient information regarding the baseline and retrofit equipment. The photos collected by the program delivery vendor help provide the data required for evaluation.

Finding 4: SBL Reporting and Tracking – (Measure-Level Cost and Incentive)

The 2019 SBL program reporting database is structured into two sets of data. One set contains projects' high-level information and includes addresses, contact information and business types. The other set contains measures' information, which details key aspects of each project's measures, such as quantity and type of equipment installed. Currently, incentive and cost data are reported on the project level, and no measure-level information is available.

> ***Recommendation 4:*** Along with measure-specific energy and demand savings, Nexant recommends reporting separate incentives and cost values for each measure, as opposed to reporting project-level incentives and cost. Having access to such information will increase the visibility into the program's performance and allow the evaluator to run various analyses regarding each implemented measure type's cost-effectiveness and performance.

Finding 5: Program free-ridership was very low in 2019.

The program's NTG was high at 98.3%, and there was a correspondingly low FR score at 4%. Two-thirds (66%) of participants were not planning on upgrading their lighting prior to learning about the program. Of those that were already planning on upgrading their lighting, more than two-fifths (44%) would have waited at least one year, and almost one-sixth (15%) would have installed less expensive or less efficient lighting without the program. Less than one-tenth (7%) would have installed the same lighting equipment and paid the full cost themselves. The low FR demonstrates that the program is largely reaching the participants who would not have made lighting upgrades without the program.

> ***Recommendation 5:*** Maintain focus on minimizing FR. Key areas of focus include (1) identifying and targeting customers who would not make upgrades without program support and (2) identifying applicants who have not already begun implementing measures.

Finding 6: Satisfaction with the program and its processes was high overall, but there is room for improvement.

Most participants had no suggestions for improving the initial site assessment (78%), the installer visit(s) (79%), or the installation process overall (84%). This suggests high levels of satisfaction with the program. Of those with suggestions for improving the site assessment, installer visit(s), or installation process overall, the most common were to shorten the time it takes to complete the visits, improve the assessor or installer's professionalism, and provide more flexibility in scheduling the visits.

> ***Recommendation 6a:*** Shorten the time it takes to complete the assessment and installer visits. Identify areas where additional program support or resources could make this easier for the assessors/installer to accomplish.
> ***Recommendation 6b:*** Provide additional training to assessors and installers to ensure professionalism during assessments and installer visits.
> ***Recommendation 6c:*** Provide more flexibility in scheduling the visits (coordinating with participants to identify suitable times for the visit, providing accurate arrival windows).

Finding 7: Additional cross-program promotion opportunities exist.

Given that nearly three-fourths (73%) of respondents did not apply to other energy-efficiency programs in 2019 besides the SBL program, opportunities exist to further promote the Save on Energy programs to these customers. For example, the Refrigeration Efficiency Program (REP) also targets the small business market and could be promoted to the SBL participants during the application process and/or at the completion of the project.

> ***Recommendation 7:*** Continue identifying cross-program promotion opportunities, especially with programs like REP, which target similar small business customers.

8. Appendix A: Detailed Net-to-gross Evaluation Methodology

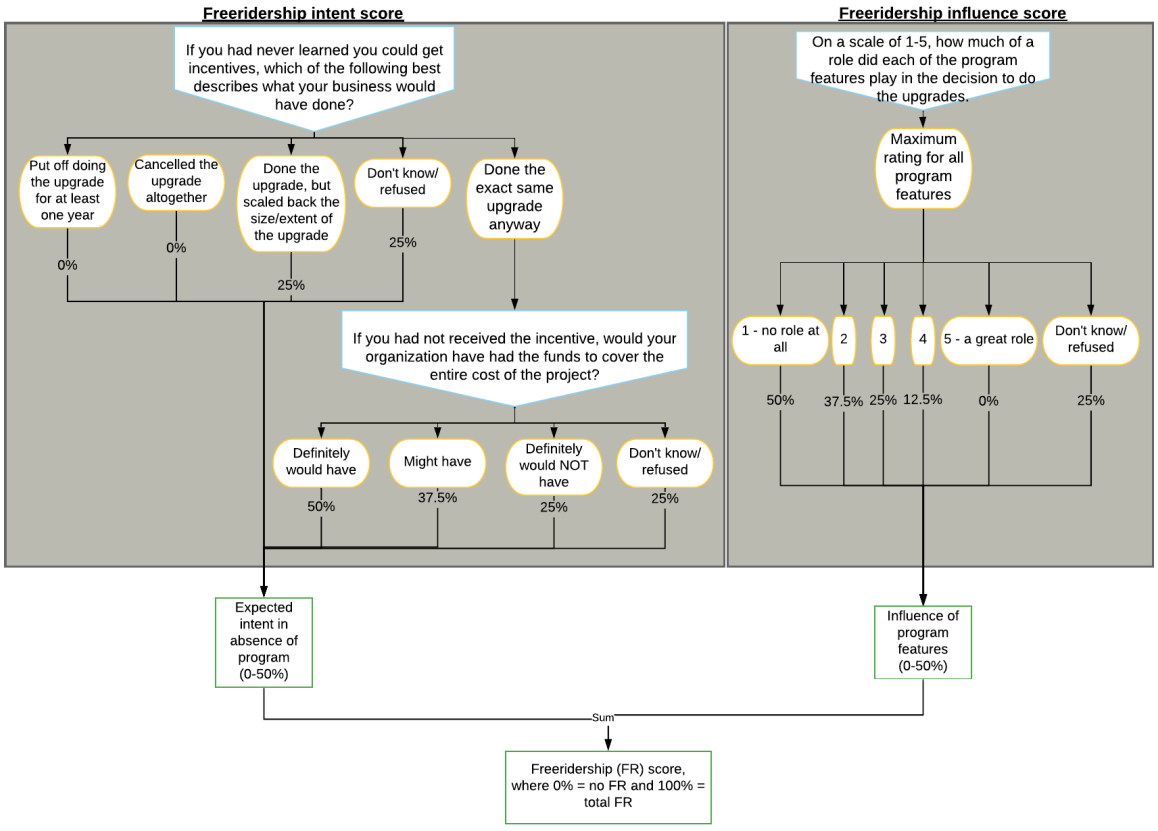
A.1 Free-ridership Methodology

The survey addressed the attribution of savings for each sampled project or type of equipment through two main components:

- Intention of the expected behaviour in the absence of the program
- Influence of various program features, such as the incentive, program marketing and outreach, and any technical assistance received.

Each component produces scores ranging from 0 to 50. The two components are summed to produce a total FR score ranging from 0 (not a free-rider) to 100 (complete free-rider). The total score is interpreted as a percentage (0% to 100%) to calculate the mean FR level for a given program. Figure 8-1 illustrates the FR methodology.

Figure 8-1: Free-ridership Methodology



Intention Component

The FR score's intention component asks participants how the evaluated project would have differed in the program's absence. The two key questions that determine the intention score are as follows:

> Question 1: If you had never learned you could get incentives/upgrades at no cost through the program, which of the following best describes what your business would have done? Your business would have
>
> 1. Put off doing the upgrade for at least one year
> 2. Cancelled the upgrade altogether
> 3. Done the upgrade, but scaled back the size or extent of the upgrade
> 4. Done the exact same upgrade anyway → Ask Question 2
> 98. Don't know
> 99. Refused
>
> [ASK ONLY IF RESPONSE TO QUESTION 1=4: Done the exact same upgrade anyway]
> Question 2: If you had not received the incentive/upgrades at no cost from the program, would you say your organization definitely would have, might have, or definitely would not have had the funds to cover the entire cost of the project?
>
> 1. Definitely would have
> 2. Might have
> 3. Definitely would not have
> 98. Don't know
> 99. Refused

Table 8-1 indicates the possible intention scores a respondent could have received depending on their responses to these two questions. If a respondent provides an answer of 1 or 2 (would postpone or cancel the upgrade), the respondent would receive an FR intention score of 0% (on a scale from 0% to 50%, where 0% is associated with no FR and 50% is associated with high FR). If a respondent answered 3 (would have done the project, but scaled back the size or extent of it) or stated they did not know or refused the question, the respondent would receive an FR intention score of 25% (associated with moderate FR). If the respondent answered 4 (would have done the exact same project anyway), they are asked the second question before an FR intention score can be assigned.

The second question asks the participants who stated they would have done the exact same project, regardless of whether their organization would have had the funds available to cover the entire project cost. If the respondent answered 1 (definitely would have had the funds), the respondent receives a score of 50% (associated with high FR). If the respondent answered 2 (might have had the funds), they receive a slightly lower FR score of 37.5%. If the respondent answered 3 (definitely would not have had the funds) or did not know or refused the question, the respondent would receive an FR intention score of 25% (associated with moderate FR).

Table 8-1: Key to Free-ridership Intention Score

Question 1 Response	Question 2 Response	Intention Score (%)
1 or 2	Not asked	0 (no FR for intention score)
3, 98 (Don't Know), or 99 (Refused)	Not asked	25
4	3, 98 (Don't Know), or 99 (Refused)	25
4	2	37.5
4	1	50 (high FR for intention score)

The bullet points below display the same FR intention scoring approach in a list form. As mentioned above, for each respondent, an intention score was calculated, ranging from 0% to 50%, based on the respondent's report of how the project would have changed had there been no program:

- Project postponement or cancellation = 0%
- Reduction in size or scope or use of less energy-efficient equipment = 25%
- The respondent does not know what they would have done in the absence of the program = 25%
- No change and respondent states firm would not have made funds available = 25%
- No change but respondent is not sure whether their firm would have made funds available = 37.5%
- No change and respondent confirms firm would have made funds available = 50%

Influence Component

The influence component of the FR score asks each respondent to rate how much of a role various potential program-related influence factors had on their decision to do the upgrade(s) in question. Influence is reported using a scale from one (1) to five (5), where one indicates it played no role at all and five indicates it played a great role. The potential influence includes the following:

- Availability of the incentives or the no-cost upgrades
- The information or recommendations provided by the IESO staff (if applicable)
- The results of any audits or technical studies that were done (if applicable)
- The information or recommendations provided by contractors, vendors or suppliers associated with the program
- Marketing materials or information provided by the program
- Previous experience with any energy-saving program
- Others (identified by the respondent)

Table 8-2 indicates the possible influence scores a respondent could receive depending on how they rated the influence factors above. For each respondent, the program influence is set equal to the maximum influence rating that a respondent reports across the various influence factors. For example, suppose the respondent provided a score of 5 (great role) to at least one of the influence factors. The program is considered to have had a great role in their decision to do the upgrade, and the influence component of FR is set to 0% (not a free rider).

Table 8-2: Key to Free-ridership Influence Score

Maximum Influence Rating	Influence Score (%)
5 - program factor(s) highly influential	0
4	12.5
3	25
2	37.5
1 - program factor(s) not influential	50
98 – Don't know	25
99 - Refused	25

The bullet points below display the same FR Influence scoring approach in a list form. As mentioned above, for each project, a program influence score was calculated, also ranging from 0% to 50%, based on the highest influence rating given, among the potential influence factors:

- Maximum rating of 1 (no influencing factor had a role in the decision to do the project) = 50%
- Maximum rating of 2 = 37.5%

- Maximum rating of 3 = 25%
- Maximum rating of 4 = 12.5%
- Maximum rating of 5 (at least one influence factor had a great role) = 0%
- Respondent does not know how much influence any factor had = 25%

The intention and program influence scores were summed for each project to generate an FR score ranging from 0 to 100. The scores are interpreted as % FR: a score of 0 indicates 0% FR (i.e., the participant was not at all a free rider), a score of 100 indicates 100% FR (i.e., the participant was a complete free rider), and a score between 0 and 100 indicates the participant was a partial free rider.

A.2 Spillover Methodology

To assess SO, respondents were asked about installing energy-efficient equipment or services that were done without a program incentive following their participation in the program. The equipment-specific details assessed are as follows:

- ENERGY STAR Appliance: type and quantity
- Fan: type, size, quantity
- HVAC: air conditioner replacement, above code minimum: tonnage and quantity
- Lighting: type, quantity, wattage, hours of operation, location, and fixture length
- Lighting – controls: type of control, type and quantity of lights connected to control, hours of operation, and percentage of time the timer turns off lights
- Motor/Pump Upgrade: type, end-use, horsepower, and efficiency quantity
- Motor/Pump Drive Improvement (VSD and Sync Belt): type, end-use, horsepower, and quantity
- Others (identified by the respondent): description of the upgrade, size, quantity, hours of operation

For each equipment type, the respondent reports installing without a program incentive.
The survey instrument asks about the extent of influence that earlier involvement in the program had on the decision to carry out the upgrades. Influence is reported using a scale from one (1) to five (5), where one indicates it played no role at all and five indicates it played a great role. Suppose the influence score is between 3 and 5 for a particular equipment type. In that case, the survey instrument solicits details about the upgrades to estimate the quantity of energy savings that the upgrade produced.

For each upgrade, the program influence rating was converted to an influence score ranging from 0% to 100%, as follows:

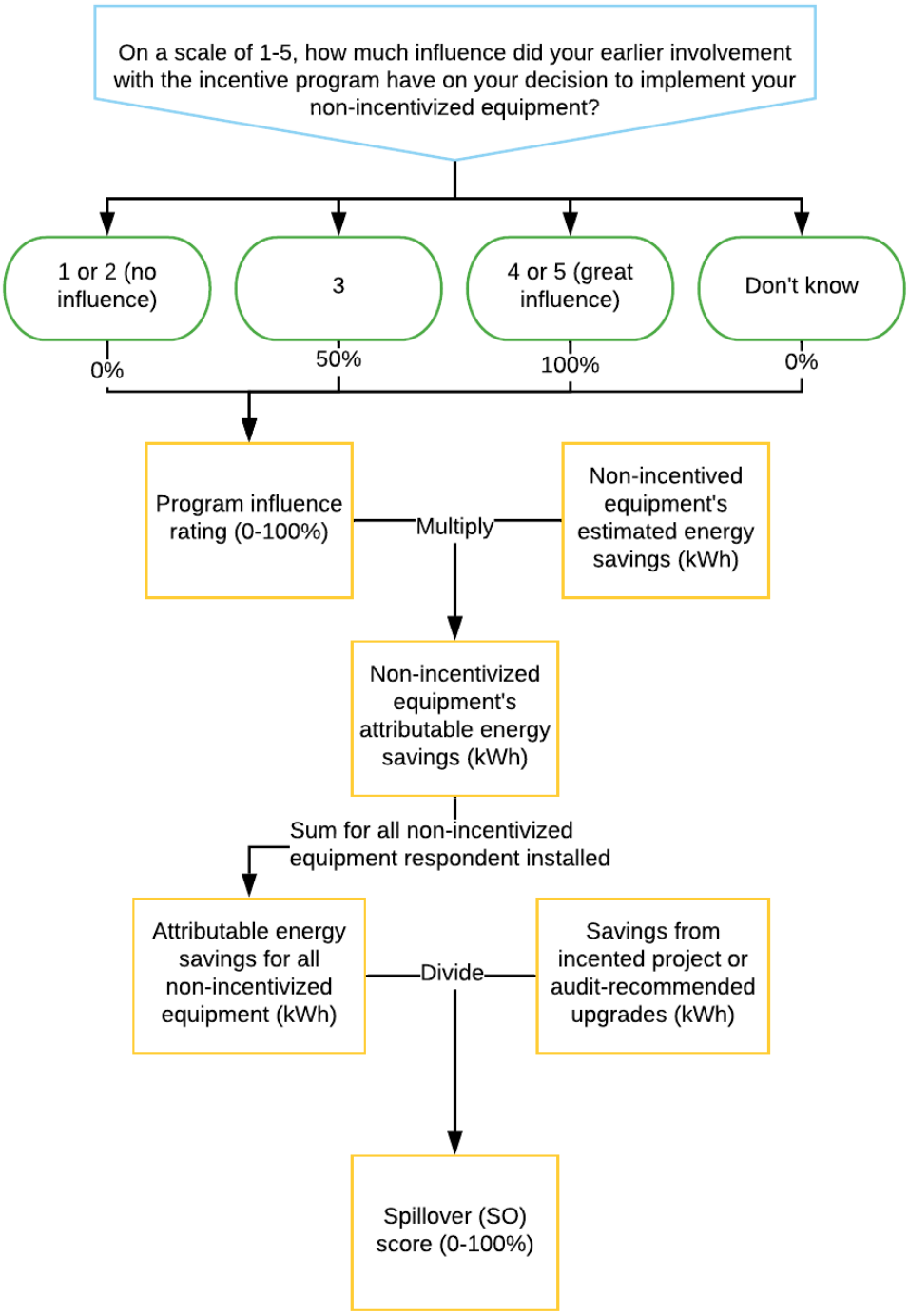
- Maximum rating of 1 or 2 (no influence) = 0%
- Maximum rating of 3 = 50%
- Maximum rating of 4 or 5 (great influence) = 100%
- Respondent does not know how much influence any factor had = 0%

The following procedure was used to calculate an SO percentage for each respondent:

- Multiplying the estimated energy savings for each upgrade by the influence percentage to calculate the upgrade's program-attributable energy savings.
- Summing program-attributable energy savings from all identified upgrades for each respondent to calculate the respondent's total SO savings.
- Dividing each respondent's total SO savings by the savings from the incented project.

Figure 8-2 illustrates the SO methodology.

Figure 8-2: Spillover Methodology



A.3 Identification of Project or Upgrade for NTG Assessment

Participants were asked to consider all their completed projects in 2019 through the particular program in question. This approach allowed for the respondent's NTG value across all the projects they completed in 2019 to be applied rather than just one.

A.4 Other Survey Questions

In addition to the questions addressing FR and SO, the survey included the following topics to provide additional context:

- Whether the respondent is the person primarily involved in decisions about upgrading equipment at their company. Suppose the respondent is not the appropriate contact. In that case, they are asked by the interviewer to be transferred to or be provided contact information for the appropriate person in the case of a phone survey. In the case of a web survey, the weblink will be forwarded to the appropriate contact.
- Whether the respondent had primary or shared responsibility for the budget or expenditure decisions for the program-incentivized work completed at their company.
- The respondent's work title.
- When the respondent first learned about the program incentives, relative to the upgrade in question (before planning; after planning, but before implementation; after implementation began, but before project completion; or after project completion).
- When the respondent submitted their application to the program, and their reasons for submitting it after the work was started or completed, if applicable.
- How the respondent learned about the program.

The responses to these questions are not included the algorithms for calculating FR or SO but do provide additional context. The first question ensures that the appropriate person responded to the survey. The other questions provide feedback about responsibility for budget and expenditure decisions, the respondent's job title, application submission process details, and how and when program influence occurs.

A.5 Net-to-gross Survey Implementation

The survey was implemented over the web and the phone. The survey lab was instructed to avoid collecting duplicate responses by no longer calling on respondents if they had responded to the web survey or deactivating the respondent's survey weblink if they had responded to the phone survey.

For each of the phone surveys, the survey lab called participants in a randomized order. After reaching the identified contact for a given participant, the interviewer explained the survey's purpose and identified the IESO as the sponsor. The interviewer asked if the contact was involved in decisions about upgrading equipment at that organization. If the contact was not involved in decisions about upgrading equipment, the interviewer asked to be transferred to or for the contact information of the appropriate decision-maker. The interviewer then attempted to reach the identified decision-maker to complete the survey.

It was assumed that all contacts who responded to the web-version of the survey were the appropriate contacts to answer the questions. The introductory text in the survey asked the respondent to forward the survey weblink to the appropriate contact to fill it out if they were not the appropriate contact to do so.

9. Appendix B: Detailed Process Evaluation Methodology

This appendix provides additional details about the process evaluation methodology. A summary of the methodology was provided in Section 3.2. The process evaluation collected primary data from key program actors, including IESO program staff, assessors, installers, and participants (Table 9-1). Data was collected using web surveys or telephone-based IDIs, depending on what was most suitable for a particular respondent group. This data, when collected and synthesized, provides a comprehensive understanding of the program.

All process evaluation data collection activities were carried out or managed by the evaluators. All survey instruments, interview guides, and sample files were developed by the evaluators for interviews and surveys. The IESO EM&V staff approved the survey instruments and interview guides. The data used to develop the sample files was retained from program records supplied either by the IESO EM&V staff or the program delivery vendor.

Table 9-1: Process Evaluation Primary Data Sources*

Respondent Type	Methodology	Population	Completed	90% CI Error Margin
IESO Program Staff	Phone IDI	1	1	0%
Program Delivery Vendor Staff	Phone IDI	1	1	0%
SBL Assessors and Installers	Web Survey	110	24	15.2%
SBL Participants	Web and Phone Survey	987	205	5.1%

***Error margin not displayed if the respondent count is below 30 unless census is achieved.**

B.1 IESO Program Staff and Program Delivery Vendor Staff Interviews

IDIs were completed with one member from the IESO program staff and one member from the program delivery vendor staff. (Table 9-2). The purpose of the interviews was to better understand the IESO program staff and program delivery vendor staff's perspectives related to program design and delivery.

The interview topics addressed program roles and responsibilities, program design and delivery, marketing and outreach, market actor engagement, program strengths and weaknesses, and suggestions for improvement.

The appropriate staff to interview were identified in consultation with the IESO EM&V staff. Telephone IDIs were conducted with the IESO program staff and the program delivery vendor staff using in-house staff (rather than through a survey lab). The IESO program staff interview was completed on July 7 of 2020, and the program delivery vendor staff interview was completed on September 11 of 2020. The interviews took approximately 45 minutes to complete.

Table 9-2: IESO Program Staff and Program Delivery Vendor Staff IDI Disposition

Disposition Report	IESO Program Staff	Program Delivery Vendor Staff
Completes	1	1
No Response	0	0
Unsubscribed	0	0
Partial Complete	0	0
Bad Contact Info (No Replacement Found)	0	0
Total Invited to Participate	1	1

B.2 SBL Assessor and Installer Survey

A total of 24 SBL assessors and installers were surveyed from a sample of 110 unique companies (Table 9-3). The purpose of the survey was to better understand the SBL assessor and installer's perspectives related to program delivery.

The survey topics addressed firmographics, project background, training and education, customer participation, improvement suggestions, job impacts, and impacts of the COVID-19 crisis.
The the sample was developed from program records provided by the program delivery vendor staff. A census-based approach was employed to reach the largest number of respondents possible, given the small number of unique contacts.

The survey was delivered over the web by the NMR staff using Qualtrics survey software. Survey implementation was conducted between September 3 and September 29 of 2020. The survey took an average of 17 minutes to complete after removing outliers.[11] Weekly e-mail reminders were sent to non-responsive contacts over the throughout web survey fielding.

[11] Note that the survey was designed to allow the respondent to come back to it at a later time to complete it if they preferred. The average survey time was calculated with this in mind and assumed that any survey that took 40 minutes or more to complete was likely completed by a respondent who took a break before completing the survey.

Table 9-3: Assessor and Installer Survey Disposition

Disposition Report	Count
Completes	24
No Response	72
Unsubscribed	0
Partial Complete	7
Screened Out	1
Bad Contact Info (No Replacement Found)	6
Total Invited to Participate	110

B.3 SBL Participant Survey

A total of 205 SBL participants were surveyed from a sample of 987 unique contacts (

Table 9-4). The purpose of the survey was to better understand the SBL participant perspectives related to program experience.

The survey topics addressed firmographics, improvement suggestions about the initial site assessment, the follow-up visit, the overall installation process, FR, SO, rebound, job impacts, participation in other programs, and the impacts of the COVID-19 crisis.

The sample was developed from program records provided by the IESO EM&V staff. Given the large number of program participants, a random subset of participants were selected for inclusion in the survey sample that did not overlap with the impact evaluation sampling.

The survey was delivered both over the phone and over the web in partnership with the Nexant survey lab using Qualtrics survey software. Survey implementation was conducted between June 4 and June 26 of 2020. The survey took an average of 13 minutes to complete after removing outliers.[12] Weekly e-mail reminders were sent to non-responsive contacts throughout web survey fielding.

[12] Note that the survey was designed to allow the respondent to come back to it at a later time to complete it if they preferred. The average survey time was calculated with this in mind and assumed that any survey that took 40 minutes or more to complete was likely completed by a respondent who took a break before completing the survey.

Table 9-4: SBL Participant Survey Disposition

Disposition Report	Count
Completes	205
No Response	640
Unsubscribed	17
Partial Complete	47
Bad Contact Info (No Replacement Found)	78
Total Invited to Participate	987

10. Appendix C: Additional Net-to-gross Evaluation Results

This appendix provides additional detail regarding the NTG results for the SBL participants.

Figure 10-1: Influence of Program Features on Participation (n=205)

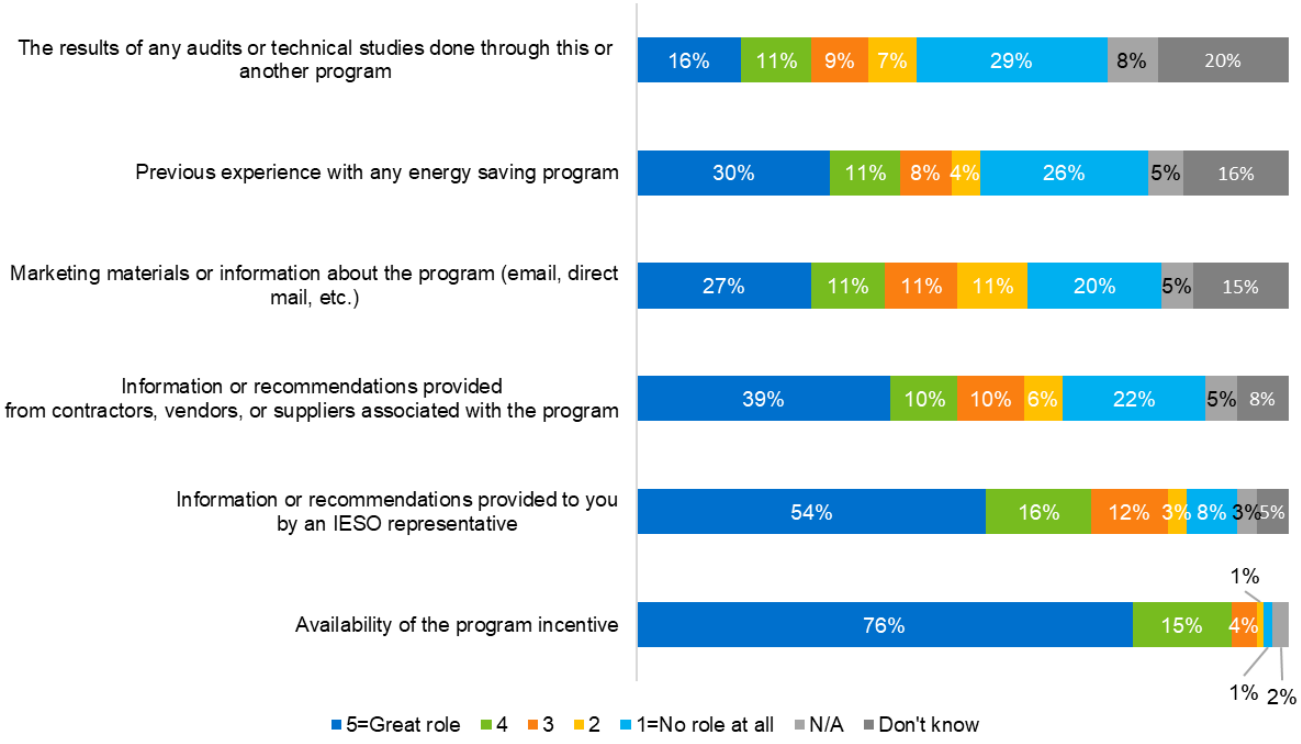


Figure 10-2 Measures Installed Due to Spillover and Program Influence

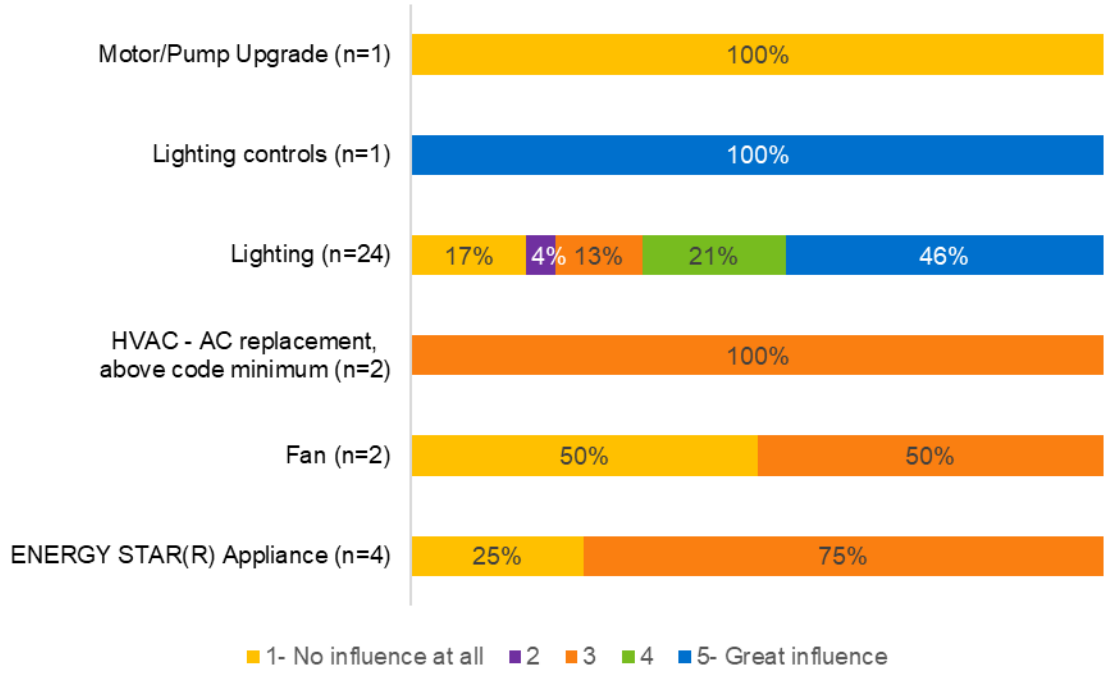


Table 10-1: Spillover Measures – ENERGY STAR Appliances

ENERGY STAR Appliance	Number of Respondents	Number of Appliances
Dishwasher	1	1
Clothes Washer	1	1
Freezer	1	1
Ice Machine	1	1
Refrigerator	2	2

Table 10-2: Spillover Measures – Lighting & Lighting Controls

Lighting or Lighting Control Type	Number of Respondents	Number of Bulbs	Number of Fixtures	Wattage / Type	Fixture Location	Ceiling Height
Compact fluorescent (CFL)	1	40				
LED exterior	5	23			Pole mount (2); Against building (21)	
LED linear	14		192			
LED screw base	2	19		11-20 (10); 31+ (9)		
Linear Fluorescent	3	428	135	T5 (1), T8(2)		<20 ft.

Table 10-3: Spillover Measures – Fans and Air Conditioners

Equipment Type	Number of Respondents	Number Installed	Size
Fan	1	2	1-foot diameter
Air conditioner replacement above code minimum	2	4	<5.4 tons (2), 11.41-20 tons (2)

11. Appendix D: SBL Building Types and Delivery Regions

Table 11-1: 2019 SBL Program reported building types

Building Type Reported in SBL Database	Nexant Designation
Agricultural Other	Agricultural
Poultry Farm	Agricultural
Cattle Farm	Agricultural
Dairy Farm	Agricultural
Swine Farm	Agricultural
Greenhouse	Agricultural
Convenience Stores	Convenience Stores
Hotels/Motels: Public Spaces	Hotels/Motels
Hotels/Motels: Guest Rooms	Hotels/Motels
Hotels: Corridors	Hotels/Motels
Office (small suite)	Office
Low Rise Office Bldgs - Core	Office
Industrial Plants: Offices	Office
Industrial Plants: General Offices	Office
Not Provided	Others
Schools	Others
Nursing Homes	Others
Laboratories	Others

Building Type Reported in SBL Database	Nexant Designation
School - High	Others
Computer Rooms	Others
Clubhouses	Others-Entertainment
Museums	Others-Entertainment
Bowling Alleys	Others-Entertainment
Places of Worship	Others-Service
Medical Centres & Clinic	Others-Service
Beauty Parlors	Others-Service
Municipal Bldgs - Town Halls	Others-Service
Barber Shops	Others-Service
Fire Stations	Others-Service
Dental Offices	Others-Service
Funeral homes	Others-Service
Banks	Others-Service
Libraries	Others-Service
Post Office: Central Area	Others-Service
Full Service Restaurants	Restaurants
Fast Food Restaurant	Restaurants
Bars & Taverns	Restaurants
Cocktail Lounges	Restaurants
Small Retail Stores	Retail
Retailer Stores	Retail

Building Type Reported in SBL Database	Nexant Designation
Department Stores	Retail
Grocery Stores	Retail
Retailer Stores in Shopping Centres	Retail
Supermarkets	Retail
Warehouses	Warehouses

Table 11-2: 2019 SBL Program Geographic Regions

Postal Code First Character	Nexant Geographic Region	Project Count
L	Central	1,466
K	Eastern	840
P	Northern	781
M	Toronto	773
N	Southwestern	628

12. Appendix E: Job Impacts Methodology

The process of using the StatCan IO model followed three steps:

1. Developed a specific set of research questions to address with the IO model, reflecting the exogenous shocks caused by the program.
2. Developed model inputs, which consisted of exogenous shock values (in dollars) to simulate the effects of SBL.
3. Ran the model and interpreted the results.

The following sections cover each step in more detail.

E.1 Developed Specific Research Questions

The first step in modelling the job impacts from the SBL program was determining specific research questions (RQs) the model would answer. In a scenario without the program's existence , customers receive electricity from the IESO and pay for it via the monthly billing process. Implementing the SBL program introduces a set of economic supply and demand shocks to different economic sectors. The four research questions below illustrate these shocks:

1. **What are the job impacts from new demand for EE measures and related program delivery services?** Funds collected for the SBL program generate a demand for efficient lighting equipment. They also generate demand for services related to program delivery, such as general overhead for program implementation and staffing. This demand creates jobs among firms that supply these products and services. Third-party program delivery vendor collect funds from the IESO to cover a portion of the project cost, while the participant covers the remainder of costs.

2. **What are the job impacts from business reinvestments?** Once energy-efficient equipment is installed, the customers realize annual energy savings for the measure's useful life. Businesses can choose to use this money to pay off debt, disburse it to shareholders as dividends, or reinvest it in the business. This additional money and the decision to save or spend has implications for additional job creation. For instance, additional business spending on goods and services generates demand that can create jobs in other economic sectors.

3. **What are the job impacts from funding the EE program?** The IESO EE programs are funded via volumetric bill charges for all customers—both residential and non-residential. This additional charge can reduce the money that households have for savings and for spending on other goods and services, which results in a negative impact on jobs in the Canadian economy.

4. **What are the job impacts from reduced electricity production?** The energy-efficient measures will allow businesses to receive the same benefit while using less electricity. The program as a whole will reduce the demand for electricity in the commercial sector. This reduced demand could have upstream impacts on the utility industry (for example, generation) and related industries, such as companies in the generator fuel supply chain.

E.2 Developed Model Inputs

The second step in modelling job impacts was to gather the data required for the StatCan IO model to answer each of the research questions. Model input data included the dollar values of the exogenous shocks from program implementation. The sources of data for each research question were as follows:

1. **Demand for EE measures and related program delivery services:** The StatCan IO Model divides the Canadian economy into 240 industry classifications and 500 SUPCs. Each measure installed as part of the program was classified into one of the SUPCs. The dollar value for each product-related demand shock was calculated using the project cost and measure savings data from the impact evaluation. Services that were part of the implementation process were also classified into SUPCs. These services were entirely program administrative services, the value of which was obtained from program budget actuals.

   It was necessary to specify the amount of each demand shock attributed to labour versus non-labour. The evaluation team used a representative sample of invoices for the product categories to estimate the average labour versus non-labour cost proportions. For the service categories, the IO model contained underlying estimates that defined the portion of labour versus overhead (non-labour).

2. **Business energy bill savings:** This value was calculated for the model as the net present value (NPV) of the discounted future stream of energy bill savings by participants. It was calculated by multiplying the net energy savings (in kWh) in each future year by that future year's retail rate ($/kWh). This calculation was performed for each future year through the end of the measure's expected useful life (EUL). Savings beyond the EUL were assumed to be zero. Project-level net energy savings were obtained using the impact evaluation results and already accounted for other calculation parameters (for example, discount rate, measure EULs, and retail rate forecast).

   Customers' intentions for spending or saving the money saved on energy bills were obtained via a short section on the customer surveys. The percentages that indicated what the customers would do with the bill savings were obtained from the participant surveys through the following three questions:

   J1. *How do you anticipate your company will spend the money it saves on its electricity bill from the energy efficient equipment upgrade?*
   1. *Pay as dividends to shareholders or otherwise distribute to owners*
   2. *Retain as savings*
   3. *Reinvest in the company (labour/additional hiring, materials, equipment, reduce losses, etc.)*
   4. *Split – Reinvest and pay as dividends/retain as savings*

   96. Other, please specify:
   98. Don't know
   99. Refused

J2. Do you anticipate the distribution of these electricity bill savings to be treated differently than any other earnings?

1. *Yes – More distributed to shareholders/owners*
2. *Yes – More to savings*
3. *Yes – More to reinvestment*
4. *No*

98. Don't know

99. Refused

J3. Approximately what would be the split between distribution, retention, and reinvestment of money saved on electricity bills? [ALLOW MULTIPLE RESPONSE OPTION]

1. *Percent distribute [NUMERIC RESPONSE BETWEEN 0 AND 100]*
2. *Percent save/retain earnings [NUMERIC RESPONSE BETWEEN 0 AND 100]*
3. *Percent reinvest [NUMERIC RESPONSE BETWEEN 0 AND 100]*

For estimating job impacts, the key input value was the amount of bill savings that businesses would reinvest as opposed to paying down debt or redistributing to shareholders.

3. **SBL funding:** a volumetric charge on electricity bills funds the IESO EE programs, and, volumetrically, residential customers accounted for 35 percent of energy consumption and non-residential customers accounted for 65 percent in 2019. The overall program budget was distributed between these two customer classes by these percentages and used as input values for the analysis.
4. **Reduced electricity production:** The NPV of retail savings (estimated as part of RQ2) was also the input for examining the potential impact of producing less electricity.

E.3 Run Model and Interpret Results

Determining the Retrofit program's total job impacts required considering possible impacts from each of the four shocks represented by the research questions. Addressing the four research questions above required three runs of the StatCan IO model, as certain components of the shocks could be consolidated and others addressed without full runs of the model. The three shocks that were modelled were as follows:

1. Demand shock as outlined in RQ1, representing the impact of the demand for EE products and services due to the Retrofit program.

2. Business Reinvestment shock representing the net amount of additional spending that the commercial sector would undertake, as described in RQ2. This was estimated by taking the NPV of energy bill savings and subtracting the amount of project costs covered by participants.

3. Household Expenditure shock representing the portion of household funds captured by increased bill charges and thus acts as a negative shock on the economy (RQ3). This was estimated by taking the portion of program funding paid for by increases to residential electricity bills.

The model output generated three types of job impact estimates:

Direct Impacts: Jobs created during the initial round of spending from the exogenous shocks. For the demand shock for EE products and services, direct impacts would be from adding employees to install measures and handling administrative duties. For the business reinvestment shock, direct impacts could be internal jobs created by businesses reinvesting savings back into the company. They could also be jobs created by businesses buying additional goods and services with energy bill savings.

Indirect Impacts: Job impacts due to inter-industry purchases as firms respond to the directly affected industries' new demands. These include jobs created up supply chains due to the EE program's demand– such as manufacturing goods or the supply of inputs.

Induced Impacts: Job impacts due to changes in the production of goods and services in response to consumer expenditures induced by households' incomes (i.e., wages) generated by the production of the direct and indirect requirements.

The IO model provides estimates for each type of job impact in the unit of *person-years*, or a job for one person for one year. It further distinguishes between two types of job impacts:

> **Total number of jobs:** This covers both employee jobs and self-employed jobs (including persons working in a family business without pay). The total number of jobs includes full-time, part-time, temporary jobs and self-employed jobs. It does not take into account the number of hours worked per employee.

Full-time Equivalent (FTE) number of jobs: This includes only employee jobs converted to full-time equivalence based on the overall average full-time hours worked in either the business or government sectors.

Model run results are presented in terms of the above job impact types (direct, indirect, and induced) and also the type of job (total jobs vs. FTEs). These results- along with the model input shock values, are presented and discussed in Section 6.

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