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Interim Framework Small Business Lighting 2020 Evaluation Report

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Finally, the evaluation team would like to thank the hundreds of participants that supported the evaluation team's impact self-assessments and telephone surveys. Their cooperation with the evaluation team's efforts has produced high quality data that will serve Ontario conservation efforts for years to come.

Acronyms and Abbreviations

EUL	Effective useful life
FR	Free-ridership
HVAC	Heating, ventilation, and air conditioning
HOU	Hours of use
IDI	In depth interview
IESO	Independent Electricity System Operator
IF	Interim Framework
kW or kWh	Measurement of demand (kW) or energy (kWh) equivalent to 1,000 W or Whr
LED	Light emitting diode
MW or MWh	Measurement of demand (MW) or energy (MWh) equivalent to 1,000,000 W or Whr
NTG	Net-to-gross
PY	Program year
SO	Spillover

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 2020 Interim Framework (IF) evaluation cycle. This Executive Summary provides a high-level overview of the impact and process evaluation results, key findings and recommendations for the SBL Program during the January 1, 2020 through December 31, 2020 evaluation period.

1.1 Impact Evaluation

An impact evaluation was performed to assess outcomes of the changes attributable to the program and quantify savings generated as a result of implementing the SBL projects in Ontario during 2020. There were 2,169 projects completed, with a total of 65,162 measures installed under the 2020 SBL Program. The Central region (28%) is the primary contributor to the program's first-year net verified energy savings, followed by the Eastern (22%) and Northern (22%) regions[1]. The net verified impact results of the 2020 SBL program are presented in Table 1-1 and Table 1-2.

Table 1-1: 2020 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)
15,545	77.7%	12,085	12.6%	99.1%	11,979	142,310	11,979

Table 1-2: 2020 SBL Program Impact Results: Summer Peak Demand

Reported Summer Demand Savings (MW)	Summer Demand Realization Rate	Gross Verified Summer Demand Savings (MW)	Gross Verified Precision at 90% Confidence	Net-to-Gross Ratio	Net Verified Summer Demand Savings (MW)	Net Verified Summer Demand Savings at 2022 (MW)
4.3	78.7%	3.4	5.1%	97.2%	3.3	3.3

Key findings and recommendation from the process evaluation are summarized below and are presented in greater detail in Section 3.4.

Finding 1. Improved Baseline and Retrofit Photos. In program years 2019 and 2020, SBL implementers submitted photos of the pre-existing baseline and retrofitted fixtures and lamps.

[1] A list of postal code designation and exact project counts for each region are presented in Appendix E.

These photos are important and helpful when verifying the baseline and retrofit measure types and wattages.

- **Recommendation 1:** As previously recommended for PY2019, specify what information should be captured in the pre-retrofit and post-retrofit pictures that are taken by the SBL assessors/installers.

Finding 2. SBL Assessment Tool (Hours of Operation) 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. Schedule based discrepancies between the operating schedules reported on the application and those verified in the field still contribute significantly to the realization rates being less than 100%.

- **Recommendation 2:** The evaluator recommends an upgrade of the existing Assessment Tool, to allow for the creation of multiple schedules for the same facility, where measures can be properly assigned to their respective operating schedules.

Finding 3. SBL Assessment Tool (Reported Demand Savings) The SBL Program reported demand savings reflect a change in connected load and are not adjusted for peak coincidence. IESO requires reporting net verified savings based on the summer peak demand definition.

- **Recommendation 3:** The SBL Assessment Tool collects actual hours of operation data for each assessed facility. The evaluator 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.

1.2 Process Evaluation

To better understand the program design and delivery in 2020, 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 findings and recommendation from the process evaluation are summarized below and are presented in greater detail in Section 4.5.

Finding 1. Program free-ridership (FR) was low in 2020, relative to historical results, at 5.6%.

- ***Recommendation 1. Maintain focus on minimizing FR. Key areas include:***
  - *identifying and targeting customers who would not make upgrades without program support,*
  - *screening customers to ensure they have not already begun implementing measures, and*
  - *encouraging all participants to complete the evaluation surveys.*

Finding 2. Many participants who were recommended additional lighting upgrades beyond the program upgrades made those upgrades.

- ***Recommendation 2.*** *Assist participants who are interested in installing additional lighting upgrades beyond those covered by the SBL program by consulting with*

customers and installers regarding the potential of having those upgrades completed concurrently with the SBL program-qualified upgrades.

Finding 3. Expanding the scope of lighting offerings was the most common improvement suggestion mentioned by assessors and installers.

- ***Recommendation 3.*** *Explore the feasibility of including more program lighting products (for example, outdoor lighting and signage offerings, 8-foot T-8 lamps).*

Finding 4. Participant perspectives on the program and its processes were positive overall, but there were some suggestions for program improvement provided by a subset of respondents.

- ***Recommendation 4a.*** Reduce the time it takes to complete the assessment and installer visits. Identify areas where additional program support or resources could allow the assessors/installers to complete these tasks more promptly.

- **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, coordinating with participants to identify suitable times for the visit and providing accurate arrival windows).

Finding 5. Additional cross-program promotion opportunities exist.

- ***Recommendation 5.*** *Continue identifying cross-program promotion opportunities which target similar small business customers, such as the Refrigeration Efficiency Program (REP).*

Finding 6. Opportunities exist to expand program marketing.

- **Recommendation 6.** Increase marketing efforts across different platforms (e.g., social media, online, and through community groups such as small business associations.

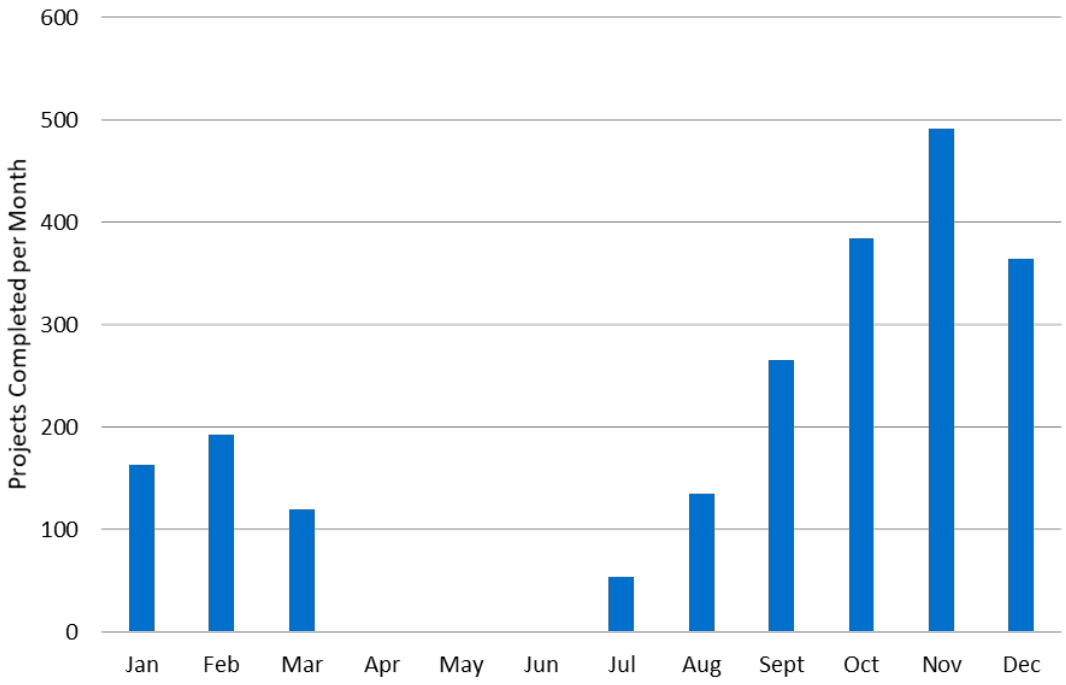
2 Introduction

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 intended to expand the program's impact and reach. Eligible measures are defined by the program and include a wide variety of lighting fixtures and lamps.

2.1 Participation

There were 2,169 projects completed, with a total of 65,162 measures installed under the SBL program in 2020. This indicates a 52% drop in participation from 2019. It is important to note that the onset of the COVID-19 pandemic persisted through PY2020, where government-mandated restrictions and lockdowns adversely influenced the delivery of the SBL program. Figure 2-1 presents the monthly projects completed during PY2020. As illustrated in the figure, the pandemic disrupted the SBL program's delivery, with no projects being implemented from April to June and participation levels beginning to recover in August 2020.

Figure 2-1: 2020 SBL Projects Completed per Month



2.2 Goals and Objectives

The goals and objectives of the 2020 SBL program evaluation are as follows:

- Conduct audits of completed projects to verify the installation of equipment and evaluate operating parameters through desk reviews
- Verify energy and summer peak 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
- Conduct cost effectiveness and greenhouse gas quantification analyses using IESO's CE tool
- Provide recommendations for program improvements based on feedback obtained from the evaluations

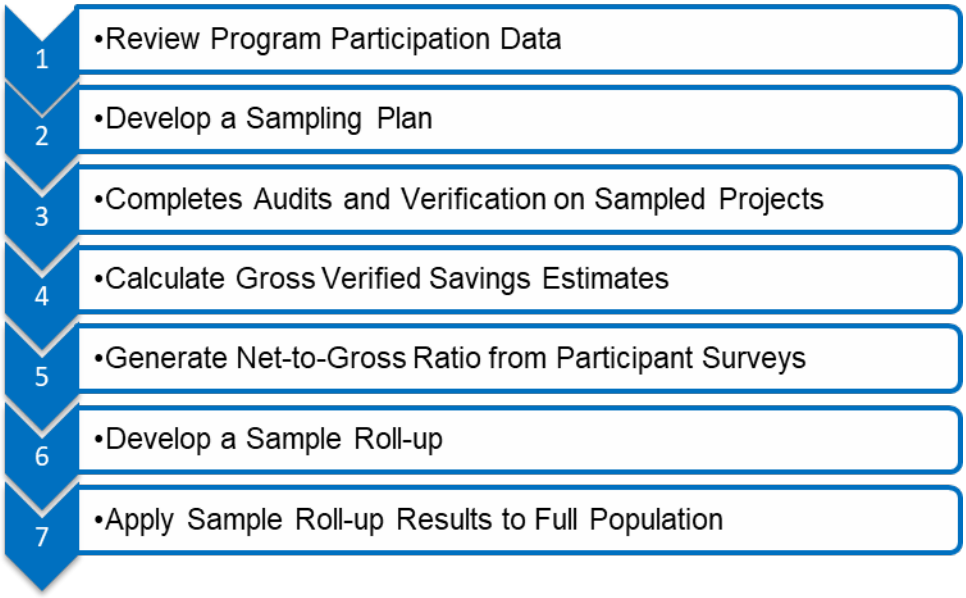
3 Impact Evaluation

An impact evaluation was performed to analyze the outcomes of the program's improvements and quantify the savings realized as a result of the program during PY2020.

3.1 Impact Evaluation Methodology

The impact evaluation methodology is built upon a series of steps, as outlined in Figure 3-1. Additional detail can be found in Appendix A: Impact Evaluation Methodology and Appendix B: Detailed Net-to-Gross Methodology.

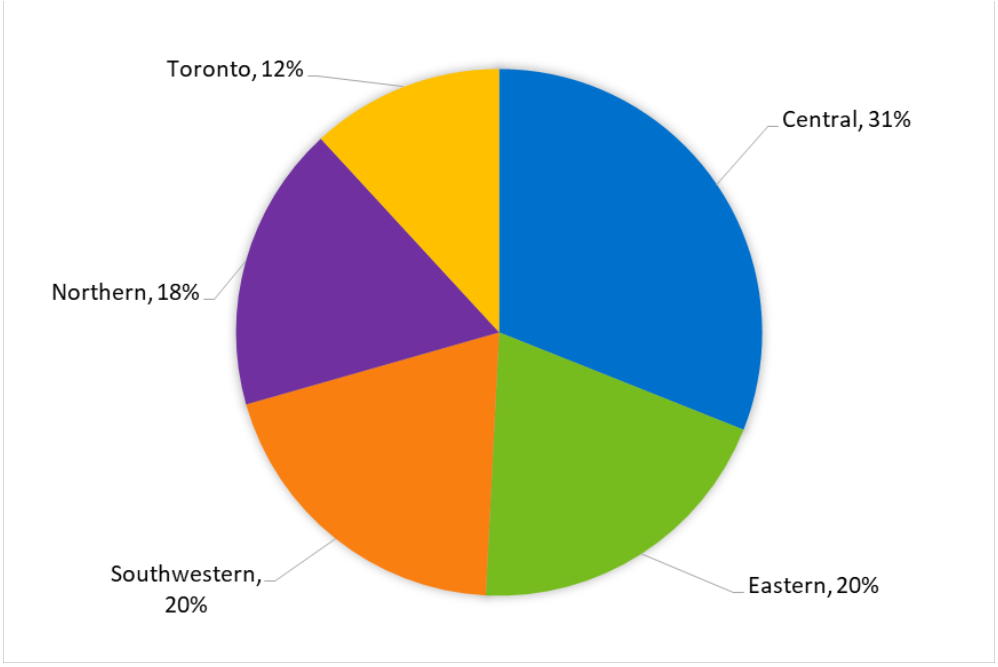
Figure 3-1: Impact Evaluation Methodology



3.2 Impact Evaluation Results

The SBL Program completed 2,169 projects with 65,162 measures in PY2020. The program database contains postal code information for each completed project, whereby each project was assigned to one of five geographical delivery regions. The Central region is the primary contributor to the SBL projects, accounting for 31% of all completed projects, followed by the Eastern and South-West regions (each at 20%) and the Northern region (18%). A list of postal code designation and exact project counts for each region are presented in Appendix E. The full breakout of projects completed in each geographical region is presented in Figure 3-2.

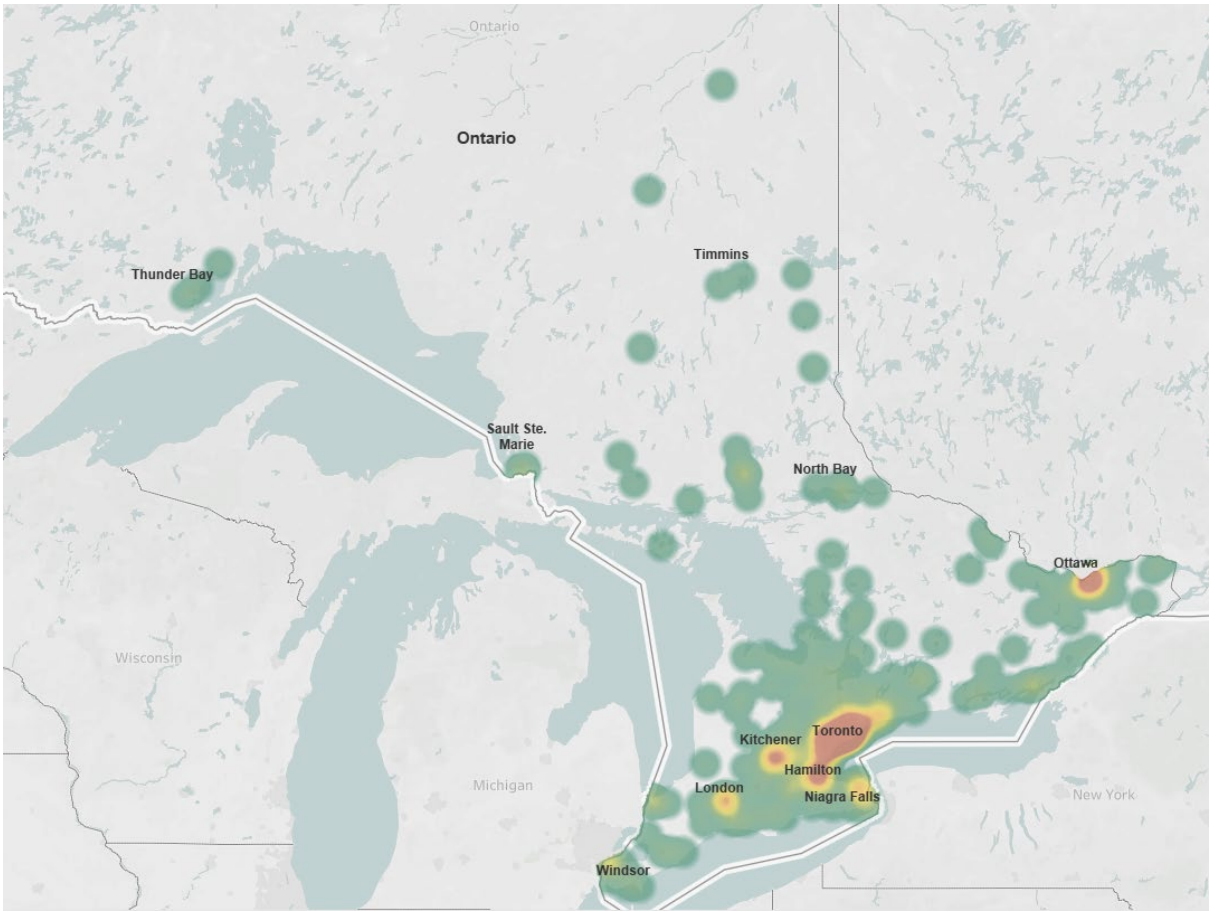
Figure 3-2: 2020 SBL Program Projects in Each Geographical Region*



*Does not sum to 100% due to rounding.

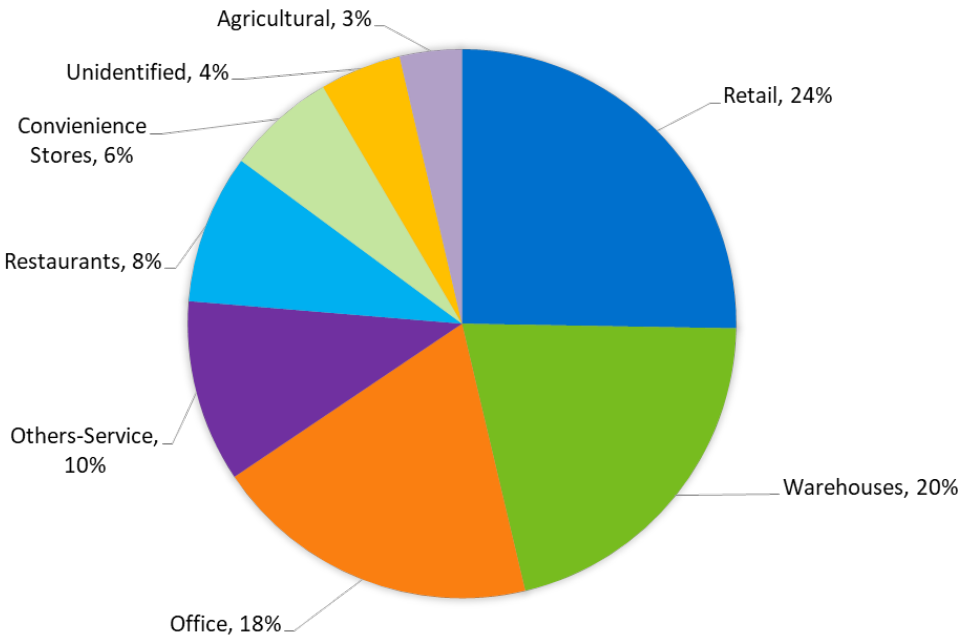
The heat map in Figure 3-3 illustrates the geographic distribution of the 2020 SBL projects across Ontario. The red, orange and yellow colour distributions depict areas with a greater density of projects, and the green overlay represents additional program activity areas. Projects are concentrated in the southern part of the province and Ottawa, with hot spots around metropolitan areas such as Toronto, Hamilton, and Kitchener, indicating the majority of projects were completed in these locations.

Figure 3-3: SBL Program Projects Distribution across Ontario



The SBL Assessment Tool allows the SBL program assessors to track and document each assessed site's facility type. The SBL database contained information regarding each completed project's facility type, with a total 41 unique facility types reported. Each unique entry was re-categorized into one of 10 possible facility types. Projects with no reported facility type (97 projects) were categorized as "unidentified." A full list of the facility types reported in the 2020 SBL program database and their respective re-categorized designation is provided in Appendix E. The retail sector, followed by warehouses and offices, contributed the most to the 2020 SBL program, accounting for 62% of completed projects. The project count distribution by greatest facility type contributors for the 2020 SBL program is presented in Figure 3-4.

Figure 3-4: 2020 SBL Program Project Count by Facility Type



The net verified impact results of the 2020 SBL program are presented in Table 3-1 and Table 3-2. All savings discussed in the remainder of this report refer to first-year net verified savings unless otherwise specified. PY2019 results including true up projects are also provided below, for comparison.

Table 3-1: SBL Program Impact Results: Energy

Program Year	Reported Energy Savings (MWh)	Energy Realization Rate	Gross Verified Energy Savings (MWh)	Net-to-Gross Ratio	Net Verified Energy Savings (MWh)	Lifetime Net Verified Energy Savings (MWh)	Net Verified Energy Savings at 2022(MWh)
2019	34,431	83.6%	28,788	98.3%	28,297	331,008	28,276
2020	15,545	77.7%	12,085	99.1%	11,979	142,310	11,979

Table 3-2: SBL Program Impact Results: Summer Peak Demand

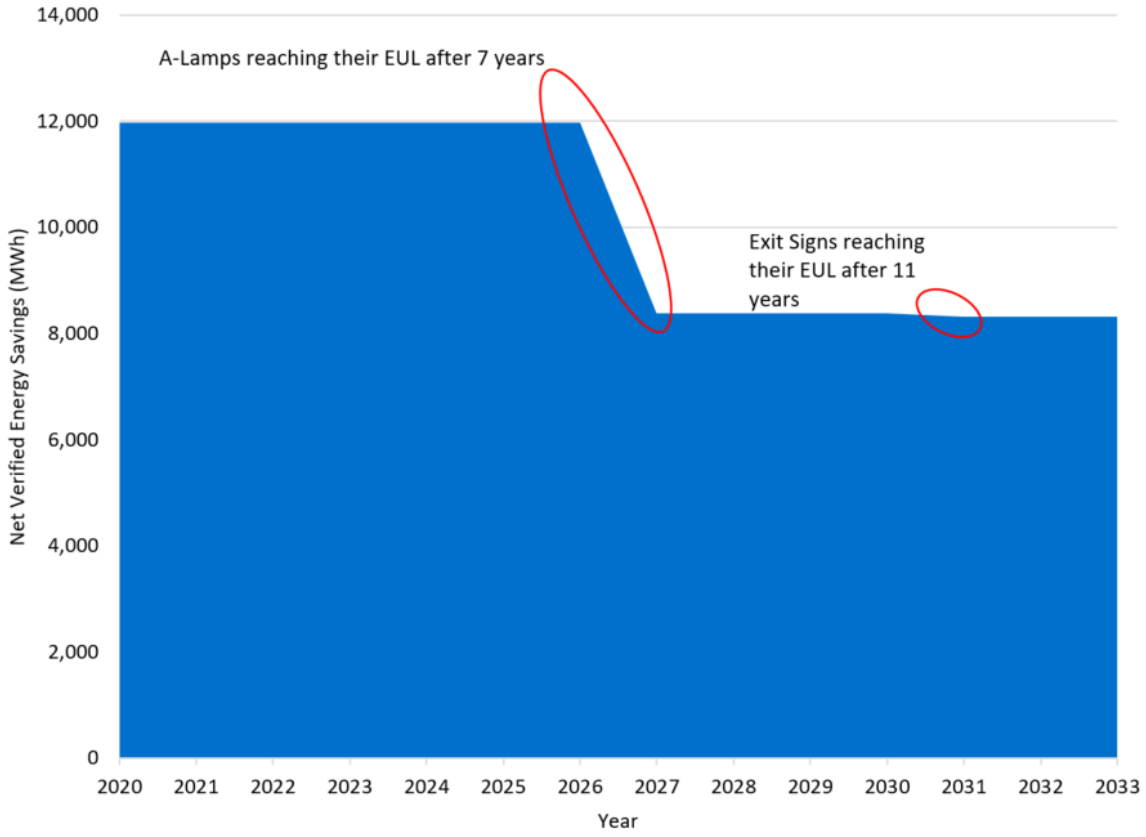
Program Year	Reported Summer Demand Savings (MW)	Summer Demand Realization Rate	Gross Verified Summer Demand Savings (MW)	Net-to-Gross Ratio	Net Verified Summer Demand Savings (MW)	Net Verified Summer Demand Savings at 2022 (MW)
2019	8.2	85.9%	7.1	98.2%	6.9	6.9
2020	4.3	78.7%	3.4	97.2%	3.3	3.3

The program realization rates presented in Table 3-1 and Table 3-2 include the interactive effects that occurred on the HVAC operation, as a result of the lighting retrofits. The methodology for calculating the interactive effects is described in A.6 , and the NTG ratio calculation is described in Appendix B.

Between 2019 and 2020, there was a 58% decrease in the first-year net verified energy savings and a 52% decrease in the first-year net verified summer peak demand savings. This decrease is primarily due to COVID-19 restrictions, resulting in a decreased number of completed projects (-52%) between 2019 and 2020. The average project size in 2020 (5,522 kWh/project) is lower than the average project size in 2019 (6,263 kWh/project).

The 2020 SBL program achieved 142,310 MWh of lifetime net verified energy savings, with 11,979 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). Figure 3-5 illustrates the annual net verified energy savings of the 2020 SBL program over time. The shortest EUL for the 2020 SBL measures is seven years, and over two-thirds (69%) of the first-year net verified savings have a EUL of 14 years and will persist until 2033.

Figure 3-5: Net Verified Energy Savings over Time



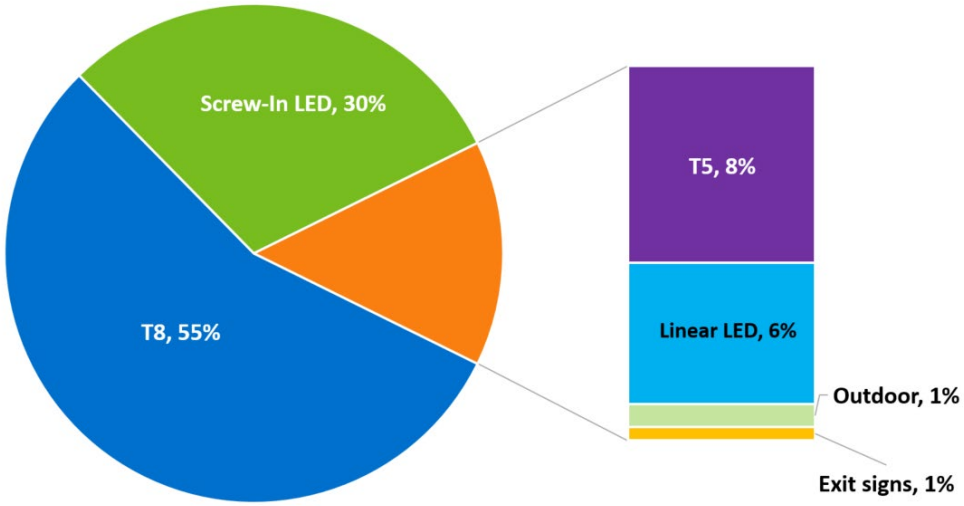
3.3 Impact Evaluation Findings

The following sections provide details on the impact findings of the installed measures, the first-year net savings, and contribution by measure, types of upgraded facilities, incentives, and program realization rates.

3.3.1 SBL Measure Types

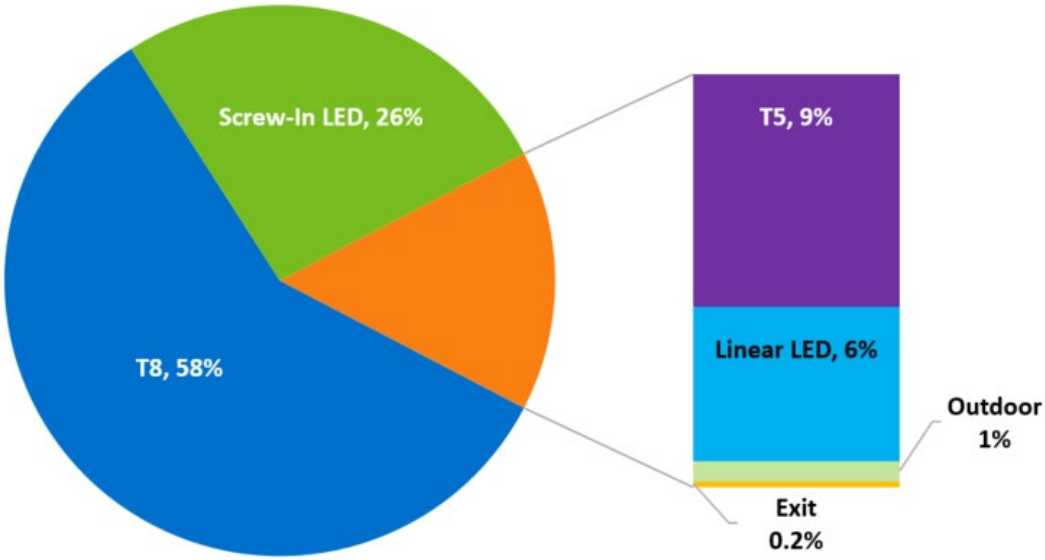
The SBL program's first-year net verified savings in 2020 were produced primarily by T8 Linear LEDs and Screw-in LEDs (specifically LED A-Lamps). These two measures made up 55% and 30% of the total first-year net verified energy savings in 2020, respectively. This trend is consistent with PY2019, where T8 Linear LEDs and Screw-in LEDs contributed 53% and 31% of the total program net verified energy savings, respectively. The full distribution of energy savings by measure type in the 2020 SBL program is shown in Figure 3-6. Similarly, T8 Linear LEDs and Screw-in LEDs are the two main contributors to the 2020 SBL summer peak demand savings, where they made up 58% and 26% of the total program net verified summer peak demand savings, respectively (Figure 3-7).

Figure 3-6: 2020 SBL Net Energy Savings Contributions by Measure Type*



*Does not sum to 100% due to rounding.

Figure 3-7: 2020 SBL Net Summer Peak Demand Savings by Measure Type*

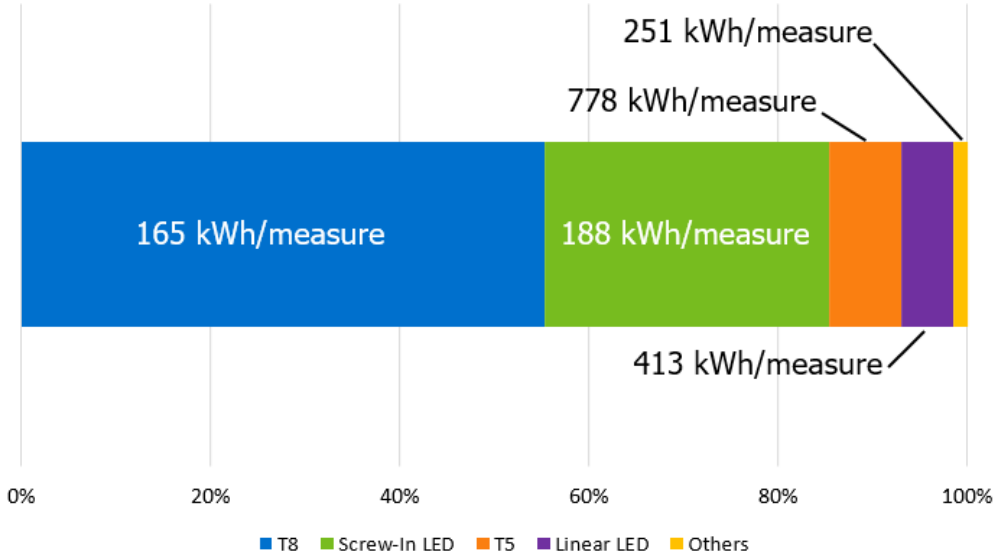


*Does not sum to 100% due to rounding.

A breakdown of the produced savings per measure/unit installed for the 2020 SBL program is provided in Figure 3-8. T8 installations accounted for 55% of the program's net verified energy savings, with an average savings of 165 kWh per measure. Contrarily, T5 installations accounted for merely 8% of the total program net verified energy savings, though they had the highest energy savings of 778 kWh per measure. The "Others" category in Figure 3-8 refers to the mix of the remaining measures that contributed to the SBL program and accounted for 1%

of the total program energy savings, with an average of 251 kWh per measure. These measures mainly consisted of outdoor lights and exit signs.

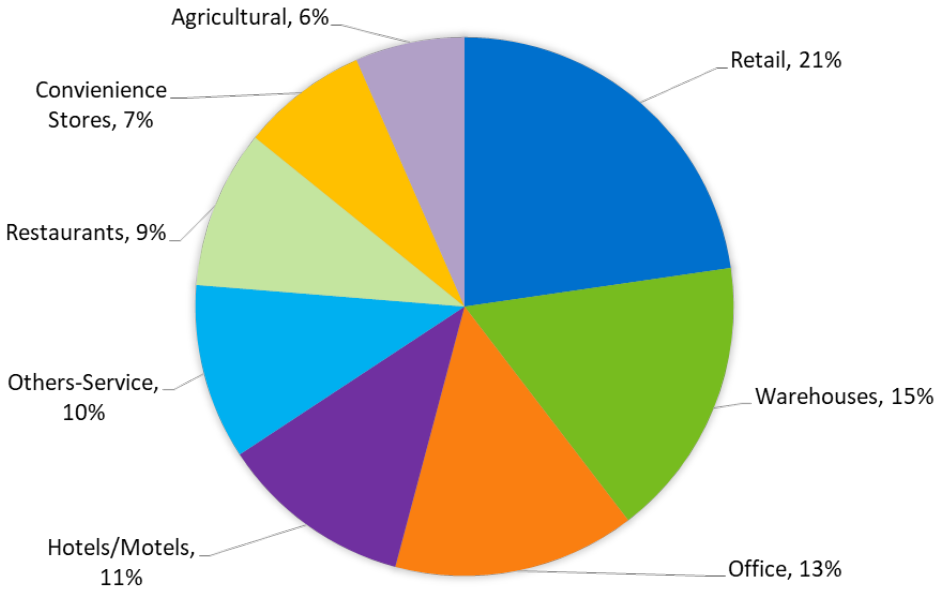
Figure 3-8: 2020 SBL per Measure Energy Savings Contribution



3.3.2 SBL Facility Types

The retail sector accounted for the majority (24%) of completed projects in 2020, followed by warehouses (20%) and offices (18%). Similar trends for the achieved net verified energy and summer peak demand savings were observed. As shown in Figure 3-9, the top contributors to the 2020 SBL program's net verified energy savings were retail facilities (21%), followed by warehouses (15%) and offices (13%).

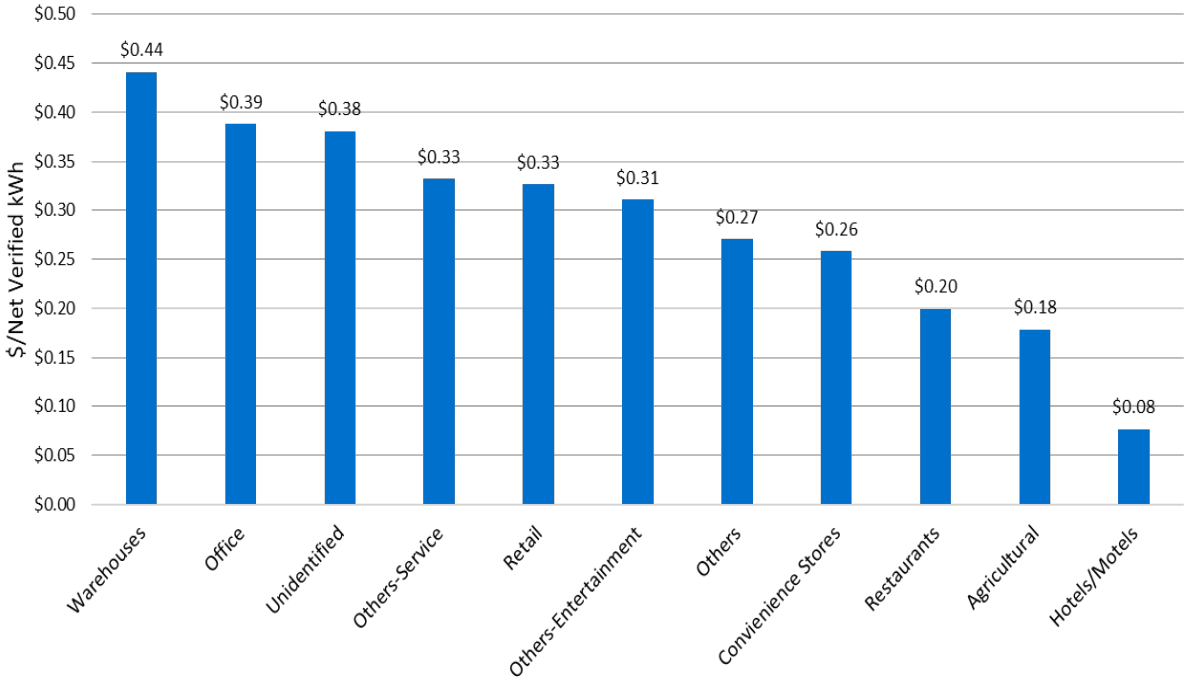
Figure 3-9: 2020 SBL Program Net Energy Savings by Facility Type Composition*



*Does not sum to 100% due to "others" and Unidentified facility types.

Depending on the facility type, the installation cost per kWh of net verified energy savings for the program ranged from $0.08 to $0.44, with an average of $0.30/kWh (Figure 3-10). This cost accounts for the total project cost charged by the delivery agent, including the IESO paid incentive and customer contribution (if any).

Figure 3-10: 2020 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, while the lower cost was attributed to installing a higher quantity of Screw-in fixtures. For instance, offices and warehouses, which had an average cost of $0.42/kWh, had 73% and 48% of their energy savings produced by Linear T8 LED Tubes, respectively. In contrast, both hotel/motel and agricultural facilities, which had an average cost of $0.11/kWh, had 68% and 56% of their energy savings achieved from A-lamps replacements, respectively. These trends are consistent with PY2019, where retail facilities and warehouses, having the highest average cost of $0.32/kWh in 2019, had 67% and 49% of their savings produced by Linear T8 LED Tubes, respectively. While agricultural and hotel/motel facilities, which had the lowest average cost of $0.11/kWh in 2019, had 67% of their savings achieved from A-lamps replacements.

3.3.3 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 additional qualified equipment above the $2,000 limit are eligible for additional incentives intended to expand the program's impact and reach. The evaluation analysis determines that 82% of the 2020 SBL participants did not exceed the maximum incentive, nor did they implement any measures beyond the cap. The average project incentive was $1,552. Only 18% 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 $688/project. These observations are closely comparable to PY2019, where the average project incentive was $1,401, where 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 in PY2020 is $402, compared to $183 in PY2019.

3.3.4 Realization Rates

The standard equations for calculating energy and peak demand savings produced by lighting upgrades 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 2020 SBL program evaluation were not feasible, leading to project verification and data collection solely through desk reviews and virtual site visits. The data used for impact evaluation analyses were limited to what was available in the 2020 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.

Energy

The energy realization rate for the 2020 SBL program is 77.7%, a decrease of 5.9% compared to the 2019 SBL energy realization rate. 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 SBL program are required to fill out a Small Business Lighting Assessment Tool. The assessment tool details the inventory of installed and removed lighting equipment 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. Sixteen (16) 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. With only one input schedule, assessors tended to input the schedule corresponding to the greatest number of hours a light would operate if varying schedules were observed. This resulted in overestimating energy savings by 23% within the sample.

The 2020 SBL program evaluation did not rely on a deemed HOU assumption. However, for reference, the average reported and verified HOU associated with the 75 sampled sites is 3,817 and 3,250 hours/year, respectively. The verified HOU for PY2020 closely matches the 3,262 hours/year verified during the 2019 evaluation.

Interactive Effects

The reported savings achieved through the 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 3-3. The verified energy savings presented elsewhere in this report include interactive effects.

Table 3-3: Significance of Interactive Effects on 2020 SBL Energy Savings

Interactive Effects	Reported Energy Savings (MWh)	Energy Realization Rate	Gross Verified Energy Savings (MWh)	Additional Interactive Savings (MWh)	Gas Heating Penalty (Therms)
Not Included	15,545	74.6%	11,592	-	-
Included	15,545	77.7%	12,085	493	232,216

Summer Peak Demand

The summer peak demand realization rate for the 2020 SBL program is 78.7%. The main contributor to the summer peak demand realization rate deviating from 100%, is that the program's reported demand savings reflect the change in connected load and are not adjusted for IESO peak coincidence[1]. Additionally, the reported demand savings do not include interactive effects, while the verified summer peak demand savings accounted for these effects. Table 3-4 shows the verified summer peak demand savings both with and without these interactive effects.

Table 3-4: Significance of Interactive Effects on 2020 SBL Summer Peak Demand Savings

Interactive Effects	Reported Demand Savings (MW)	Summer Peak Demand Realization Rate	Gross Verified Summer Peak Demand Savings (MWh)	Additional Interactive Savings (MW)
Not Included	4.3	69.6%	3.0	-
Included	4.3	78.7%	3.4	0.4

The SBL Assessment Tool collects actual HOU data for each assessed facility. In future iterations of the SBL, or similarly designed direct-install programs, it is recommended to utilize the actual collected HOU to calculate the corresponding portion of the change in the connected load during the peak window or the peak coincidence factor (CF) of each project. This would help to accurately report summer peak demand savings.

3.3.5 SBL Cost Effectiveness

A cost-effectiveness (CE) analysis for the SBL was conducted using IESO's CE Tool V7.1. The cost-effectiveness results are presented in

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

Table 3-5. The SBL program passed the Total Resource Cost (TRC) test and the Program Administrator Cost (PAC) test, with both benefits exceeding their respective costs. The PY2020 CE is improved compared to 2019, as 2019 was the first year in the IF with relatively higher costs to start up the program.

Table 3-5: IF SBL Program Cost Effectiveness Results

Cost Effectiveness Test	Value		
Total Resource Cost (TRC)	**2020**	**2019**	**2019 and 2020**
TRC Costs ($)	$4,571,948	$9,419,933	$13,991,881
TRC Benefits ($)	$6,695,057	$12,577,671	$19,272,727
TRC Net Benefits ($)	$2,123,108	$3,157,738	$5,280,846
TRC Net Benefit (Ratio)	1.46	1.34	1.38
Program Administrator Cost (PAC)	**2020**	**2019**	**2019 and 2020**
PAC Costs ($)	$4,338,233	$8,684,454	$13,022,686
PAC Benefits ($)	$7,427,441	$14,435,595	$21,863,036
PAC Net Benefits ($)	$3,089,208	$5,751,141	$8,840,349
PAC Net Benefit (Ratio)	1.71	1.66	1.68
Levelized Unit Energy Cost (LUEC)	**2020**	**2019**	**2019 and 2020**
$/kWh	$0.04	$0.04	$0.04
$/kW	$150.1	$143.5	$145.6

3.3.6 Avoided Greenhouse Gas Emissions

The evaluation team used the IESO CE Tool V7.1 to calculate the avoided GHG emissions. Avoided GHG emissions were calculated for the first years of PY 2019 and 2020 and for the lifetime of the measures. Table 3-6 below represents the results of the avoided GHG emissions calculations.

Table 3-6: IF SBL Avoided Greenhouse Gas Emissions

Program Year	First Year GHG Avoided (Tonnes CO_2 equivalent)			Lifetime GHG Avoided (Tonnes CO_2 equivalent)		
	Electric	Gas*	Total	Electric	Gas*	Total
2019**	2,271.8	-3,001.0	**-729.2**	47,557.6	-35,118.2	**12,439.4**
2020	1,303.4	-1,302.4	**1.0**	21,399.7	-15,472.9	**5,926.8**
2019 - 2020	3,575.2	-4,303.4	**-728.2**	68,957.3	-50,591.1	**18,366.2**

*Interactive gas penalty
** Include PY2019 True ups

3.4 Impact Evaluation Findings and Recommendations

Finding 1. Improved Baseline and Retrofit Photos. In program years 2019 and 2020, SBL implementers submitted photos of the pre-existing baseline and retrofitted fixtures and lamps. 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 do not provide useful information about the lamp wattage or lamp type. There were a few instances where the photos captured enough detail of the lamps or fixtures to definitively determine the wattages.

- **Recommendation 1:** As previously recommended for PY2019, specify what information should be captured in the pre-retrofit and post-retrofit pictures that are taken by the SBL assessors/installers. Specify that pictures of the replaced equipment should capture the wattage of the lamps and, if applicable, the type of ballast. This is specifically critical for direct install programs. The participants of such programs often do not possess sufficient information regarding the baseline and retrofit equipment, and the photos collected by the delivery agent would help provide the data required for evaluation.

Finding 2. SBL Assessment Tool (Hours of Operation) The 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, but discrepancies between the operating schedules reported on the application and those verified in the field still 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 2:** The evaluator recommends an upgrade of the existing Assessment Tool, to 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, the evaluator 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 in contractor trainings that in cases where multiple schedules exist, the schedule entered should be for the lights that are expected to generate most of the energy savings.

Finding 3. SBL Assessment Tool (Reported Demand Savings) The SBL Program reported demand savings reflect a change in connected load and are not adjusted for peak coincidence. IESO requires reporting net verified savings based on the summer peak demand definition. This discrepancy is the main contributor to the SBL program peak demand definition.

- **Recommendation 3:** The SBL Assessment Tool collects actual hours of operation data for each assessed facility. The evaluator 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 correctly report summer peak demand savings. Alternatively, if there is a need to maintain the current Assessment Tool design, the evaluator recommends using a predefined peak coincidence factor (CF) based on 8760 load shapes available in IESO's Measures and Assumptions List (MAL) and libraries.

Finding 4. SBL Reporting and Tracking (Measure-Level Cost). The SBL Program reporting database is structured into two sets of data; one for projects' high-level information such as address, contact information and business type, and the other set is for measures' information which details key aspects of the individual measures included within each project, such as quantity and type of equipment installed. Currently, cost data are reported on the project level, and no measure-level information is available. During PY2019 evaluation cycle, both cost and incentive data were reported at the project level. Incentive data is now reported at the measure level.

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

Finding 5. Project claimed incentives below program incentive cap. The evaluation analysis determines that 82% of the 2020 SBL participants did not exceed the maximum incentive, nor did they implement any measures beyond the cap. The average project incentive was $1,552. This finding is consistent with what was observed for PY2019, where the average claimed incentive was $1,401, and 72% of the 2019 participants did not reach the incentive cap.

- **Recommendation 5:** These observations indicate that there may be room for more opportunities/savings from SBL participants. It is recommended to consider expanding the SBL eligible measures list, to ensure participants have sufficient measures to choose from to maximize their benefit, and program savings.

Finding 6. The implementation cost per kWh varies drastically, with an average of $0.3/kWh. Depending on the facility type, the installation cost per kWh of net verified energy savings for the program ranged from $0.08 to $0.44. The high cost resulted from installing more Linear LED Tubes, while the lower cost was attributed to installing a higher quantity of Screw-in fixtures. For instance, offices and warehouses, which had an average cost of $0.42/kWh, had 73% and 48% of their energy savings produced by Linear T8 LED Tubes, respectively. In contrast, both hotel/motel and agricultural facilities, which had an average cost of $0.11/kWh, had 68% and 56% of their energy savings achieved from A-lamps replacements, respectively.

- **Recommendation 6:** To maximize the cost effectiveness of the program, consider focusing on reaching out to facilities that tend to install more screw-in fixtures than linear tubes, such as hotel/motels and agricultural facilities. For more details and a full list of implementation cost per facility type, please refer to section 3.3.2 of the 2020 SBL evaluation report.

3.5 Net-to-Gross

The NTG evaluation results are presented in the following subsections, and Appendix D presents additional details.

Table 3-7 presents the results of the 2020 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 3-7: SBL Program Net-to-gross Results[2]

Unique Participants	NTG Responses	Savings Weighted Free-ridership	Spillover, energy	Spillover, summer demand	Net-to-Gross, energy	Net-to-gross, summer demand	Energy Precision
994	181	5.6%	4.7%	2.8%	99.1%	97.2%	3.9%

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

3.5.1 Key Findings

Key findings from the NTG analysis include the following:

- Participant feedback indicates very low levels of FR at 5.6%.
- More than two-fifths (46%) of participants were not planning on upgrading their lighting before learning about the program.
- Of those already planning on upgrading their lighting, almost two-fifths (39%) would have waited at least one year, and almost one-third (32%) would have installed less expensive or less efficient lighting without the program.
- More than one in ten (14%) 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 (84%).
- Participation in the program resulted in a moderately low SO at 5.6%. Around one-tenth (12%) installed equipment with attributable SO savings.

3.5.2 Free-ridership

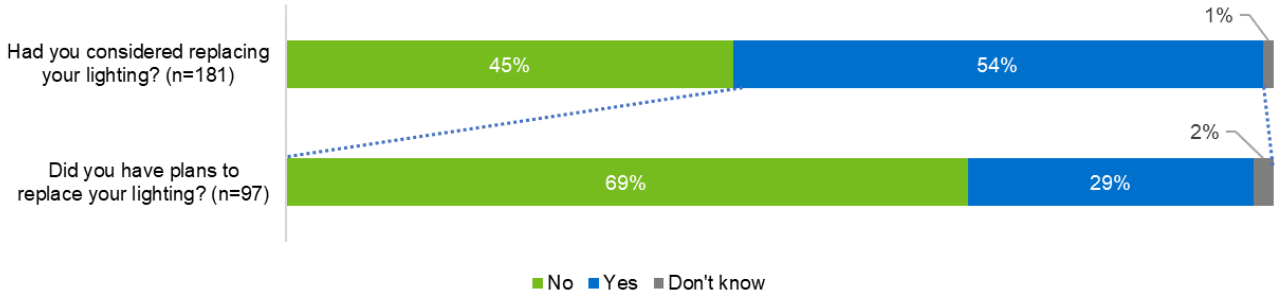
The extent of FR within the program was assessed by surveying the SBL participants to understand their experiences and plans before learning about the program, what they would have done in the program's absence, and how influential the program was on their decision to implement the energy-efficient upgrades.

[2] The count of respondents associated with the NTG evaluation results is one less (n=181) than the count of respondents associated with the process evaluation results (n=182) due to the NTG results being finalized prior to the submission of one final response to the participant survey.

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 (54%) of the survey respondents had considered replacing their lights before being contacted by the program, while over two-fifths (45%) had not.

Of the survey respondents who stated they considered replacing their lights, almost one-third (29%) already had plans to install new lighting before learning about the program, indicating potential FR (Figure 3-11). However, more than two-thirds (69%) of the respondents who 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 provide additional context for understanding the participants' decision-making processes.

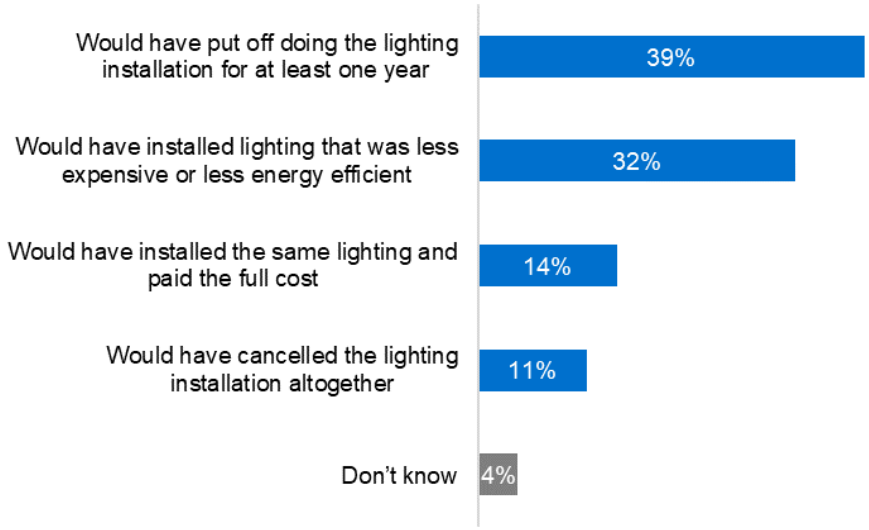
Figure 3-11: Actions Taken Prior to Learning of Program*



*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 3-12). Overall, their responses suggest relatively low FR as more than four-fifths of participants (82%) 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 (14%) or were unsure of what they would have done (4%), which indicates partial or full FR for these respondents. Responses from this participant intent question were factored into the FR analysis.

Figure 3-12: Actions in Absence of Program (n=28)*



*Does not sum to 100% due to rounding.

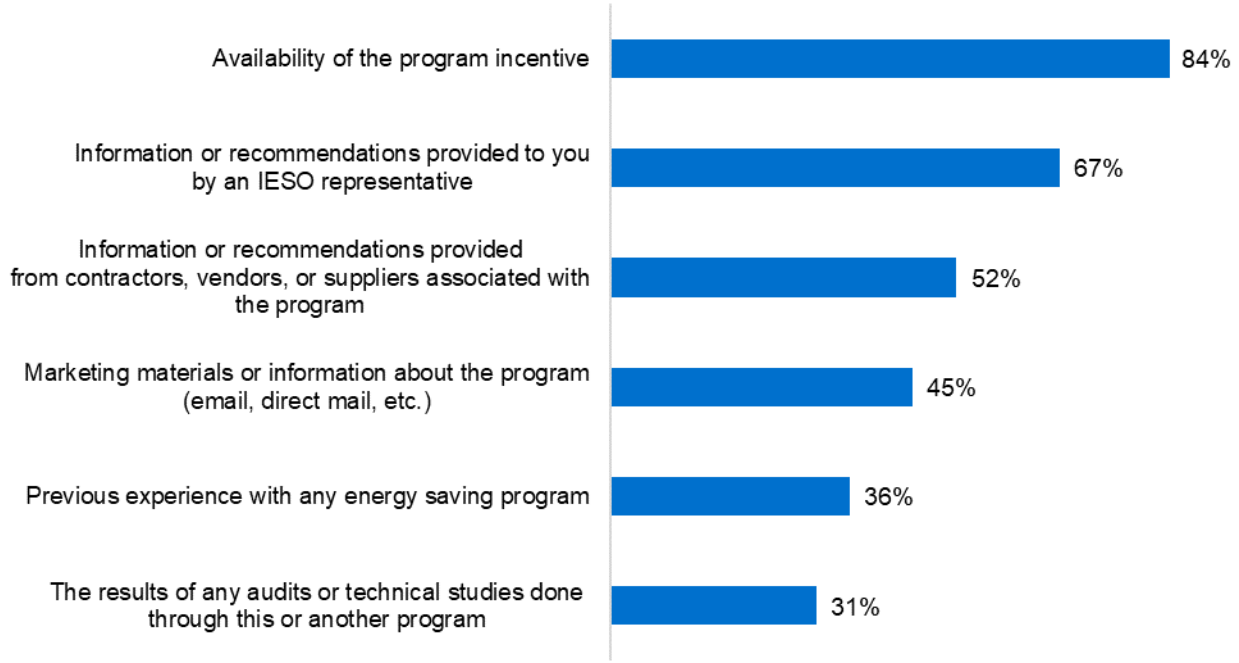
Respondents who indicated they would have installed less expensive or less energy-efficient lighting were then asked to describe how much they would have reduced the project's size, scope, or efficiency. Four of these respondents stated they would have reduced the size, scope, or efficiency by a moderate amount, while two respondents would have reduced it by a small amount. The remaining three respondents were unsure. These results indicate 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 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 four 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 3-13). 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." The highest rated responses were the availability of incentives (84% with a rating of 4 or 5) and the information or recommendations provided by an IESO representative (67% with a rating of 4 or 5). Respondents rated the results of audits or technical studies completed through the SBL or other programs as the least influential (31% with a rating of 4 or 5). This suggests an opportunity to assess the program's effectiveness in providing technical information to customers. 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 3-13: Influence of Program Features on Participation (n=181)

(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 3-8). The most common factors were lighting improvements were needed (44%), saving money on electricity bills (42%), saving energy/concern for the environment (28%), and the lack of cost to participate (6%).

Table 3-8: Other Influential Factors on Upgrade Decision

(Open-end and multiple response allowed; n=50)*

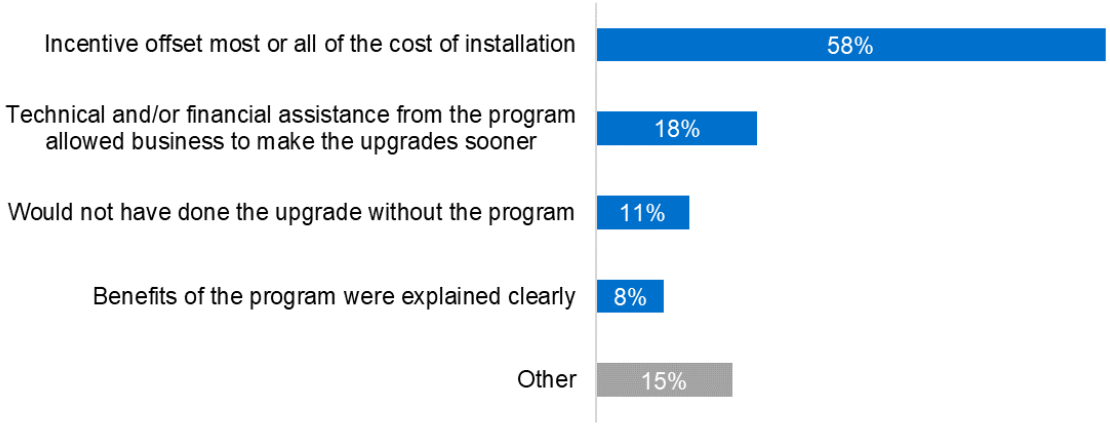
Other Influential Factors	Respondents
Lighting improvements were needed	44%
Saving money on electric bill	42%
Energy/environmental concerns	28%
No cost to participate	6%
Ease of participation in the program	4%
Fast delivery on installation	4%

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

Participants were then asked to explain in their own words what impact, if any, the financial support or technical assistance they received from the program had on their decision to install the program incentivized equipment at the time that they did (Figure 3-14). Of the more than half (57%) of those who responded, the most common responses were related to the financial

incentive offset for most, or all of the installation cost (58%) and the financial incentive or technical assistance allowed their business to make their upgrades sooner (18%).

Figure 3-14: Program Impact on Decision to Install Equipment
(Open end and multiple response allowed; n=104)



Participants who provided other influential factors relating to the financial incentive or technical assistance mentioned the following:

- No work required; easy to participate (4 respondents)
- Program came along at the right time (3 respondents)
- Technical assistance and labour were provided by the program (3 respondents)
- Helped keep the staff employed (1 respondent)
- Participant did not have to search for the program (1 respondent)

In summary, the FR results among the SBL program participants indicate very low levels of FR (5.6% FR score). In combination with the other responses shown in this section, this low FR score demonstrates the program is generally reaching the participants who would not have implemented lighting upgrades without the program.

3.5.3 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 (16%) of the participants reported installing new equipment.

Table 3-9 displays the types of non-incentivized equipment installed by companies after their SBL project was completed. Some survey respondents installed multiple equipment types. Non-incentivized lighting was the most common equipment type installed (72%).

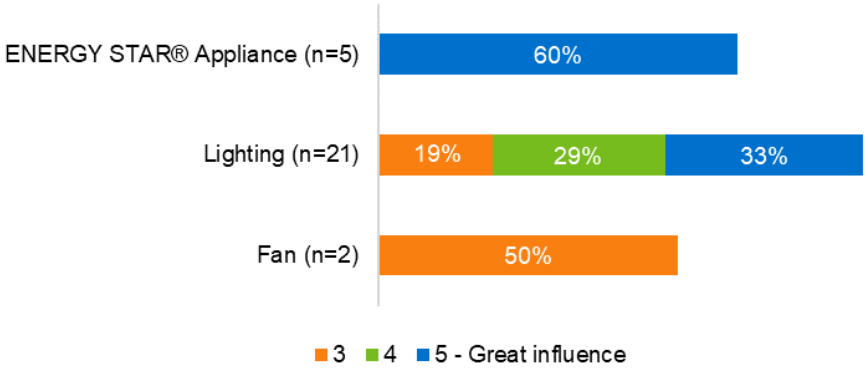
Table 3-9: Types of Upgrades Installed after Program Participation
(Multiple response allowed; n=29)*

Type of Upgrades Installed	Equipment Installed
Lighting	72%
ENERGY STAR appliance	17%
Fan	7%
HVAC - air conditioner replacement, above code minimum	7%
Motor/Pump upgrade	3%
Lighting – controls	3%
Motor/Pump drive improvement	3%

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

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 rating of 3 or higher) is shown in Figure 3-15 for each equipment type. All the respondents who installed ENERGY STAR appliances, lighting, and fans reported being influenced by the SBL program.

Figure 3-15: Program Influence on Equipment Installed Outside the Program
(Multiple response allowed)
(Rating of 3, 4, or 5 on a scale from 1 to 5)



Participants who indicated 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 Appendix D and are used within the NTG algorithm to attribute SO savings to each equipment installation. SO savings were driven mainly by the installation of 347 new LED linear fixture upgrades completed by nine respondents and 17 new LED exterior upgrades completed by five respondents.

4 Process Evaluation

A process evaluation was performed to better understand the design and delivery of the SBL program. The IESO program staff and delivery vendor interviews as well as assessor, installer, and participant surveys were utilized to gather primary data to support this evaluation. In the sections below, if the number of respondents to a question is under 20, counts are shown rather than percentages. The results should be considered as directional given the small number of respondents.

4.1 Process Methodology

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 4-1 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 Appendix C.

Table 4-1: 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	54	17	17.0%
SBL Participants	Web and Phone Survey	994	182[1]	5.5%

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

4.1.1 IESO Program Staff and Program Delivery Vendor Staff Interviews

An in-depth interview (IDI) was completed with one member of the IESO program staff, and a second IDI was completed with two members of the program delivery vendor staff. The appropriate staff to interview were identified in consultation with the IESO EM&V staff. Interview topics included:

- program roles and responsibilities

[1] The count of respondents associated with the process evaluation results (n=182) is one more than the count of respondents associated with the NTG evaluation results (n=181) due to the NTG results being finalized prior to the submission of one final response to the participant survey

- program design and delivery
- marketing and outreach
- market actor engagement
- program strengths and weaknesses
- suggestions for improvement

4.1.2 Assessor and Installer Survey

A total of 54 unique companies in the sample were emailed to request their participation in the survey. A total of 17 assessors and installers 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 included:

- firmographics
- project background
- training and education
- customer participation
- barriers and suggestions for improvement
- satisfaction
- job impacts
- impacts of the COVID-19 crisis

4.1.3 Participant Survey

A total of 994 companies in the sample were contacted by phone or email to request their participation in the survey. A total of 182 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 included:

- firmographics
- suggestions for improvement of the initial site assessment, the follow-up visit, and the overall installation process
- FR and SO
- additional lighting upgrades
- control equipment
- participation in other programs
- job impacts
- impacts of the COVID-19 crisis

4.2 IESO Program Staff and Delivery Vendor Perspectives

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

4.2.1 Key Findings

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

- In 2020, the SBL program design shifted from a province-wide focus to a regional focus, with specific targets associated with each region. One delivery vendor continued to provide support across all these regions.
- Both the IESO program staff and delivery vendor staff indicated that the program's delivery went well in 2020 despite the challenges associated with COVID-19.
- The IESO program staff indicated that the delivery vendor effectively engaged eligible customers, ensuring they met the program's participation criteria.
- The IESO program staff reported that the delivery vendor communicated effectively with their network of assessors and installers regarding which regions were under lockdown. They noted they were quick to start or stop program delivery depending on changing guidelines across the province.
- As in 2019, most customer outreach and lead generation were performed by the delivery vendor's in-house call center.
- The IESO program staff stated that, to the greatest extent possible going forward, it will be important to ensure that there are broad enough supplier and installer networks available in the market to maintain sufficient stock of available equipment.
- The program delivery vendor staff stated some of the program-eligible measures were not proving to be cost-effective, and it may be beneficial to review them in future iterations of the program.

4.2.2 Design and Delivery

In 2020, the SBL program design shifted from a province-wide focus to a regional focus, with specific targets associated with each region. The program was delivered similar to 2019, given that one delivery vendor had won the contract for all regions. Since 2019, the program has operated under a pay-for-performance model, which the IESO program staff indicated is intended to encourage the vendor to achieve greater savings for field assessments and ensure high customer satisfaction.

The IESO program staff indicated the delivery vendor effectively engaged eligible customers, ensuring they met the program's participation criteria and presenting questions to the IESO when there was uncertainty around a customer's eligibility. According to the delivery vendor staff, the interactions between the various program actors was successful. They also mentioned a great working relationship with the IESO and described it as a constructive and collaborative partnership.

The IESO program staff stated they collaborated with the program delivery vendor to design protocols for COVID-19-related health and safety standards, as well as how and when to cease or continue program services in accordance with provincial guidelines. Waitlists for customers interested in the program were used when different regions were under lockdown. The delivery vendor would then re-engage with the waitlisted customers at a later point when provincial guidelines allowed. Both the IESO program staff and delivery vendor staff indicated this process worked very well. IESO program staff indicated that being able to clearly set expectations for the delay in installations helped to ensure that customer satisfaction was maintained.

The program utilized various quality control (QC) procedures to ensure its effective delivery. For example, the IESO program staff performed a QC check of the file content for each of the monthly reporting templates provided by the vendor to verify that all documents required for the program were collected and all installation services were completed. The delivery vendor also implemented several QC procedures, including a thorough inspection of all work orders sent to and received by contractors. To keep track of all projects, they utilized program management software.

4.2.3 Assessors and Installer Engagement

The program's assessors were usually employed directly by the program delivery vendor. The program's installers were commonly local, independent firms hired by the program delivery vendor to complete the lighting installations. The delivery vendor was responsible for all onboarding, assessor and installer training, and ongoing communications with assessors and installers regarding program updates.

The delivery vendor described the training that they provided to the assessors and installers. Initial training for assessors comprised a three-day workshop covering pertinent lighting measures, procedures for interacting with customers, and program software. Installers were trained on program regulations, expectations and guidelines for interfacing with customers, installation processes, pre and post-install photo requirements, among other topics.

The delivery vendor noted they are expanding their network in areas of the province where contractor availability and client demand are more disparate. They also indicated they worked with installers who are willing to travel to sites of less coverage for installations when needed.

The delivery vendor stated they endeavored to improve communications between customers, assessors, and installers by providing additional communication protocol training. Additionally, they stated that streamlining the communication across the different individuals improved the customer experience.

4.2.4 Customer Engagement

The program delivery vendor is primarily responsible for customer engagement for the SBL program. The delivery vendor stated that there were no substantial changes from the 2019 program's customer engagement approach. In 2019, most customer outreach and lead generation were performed by the delivery vendor's in-house call center. In 2020, the call center staff decreased, with canvassing performed by the assessors and installers when feasible. The delivery vendor staff also indicated that word-of-mouth and referrals were also common methods for customers to engage with the program. Additionally, they noted that a lead in one

area would often serve as the initial starting point for the call center staff to reach out to other businesses to set up other assessments in that same area.

The IESO's program promotion was minimal, emphasizing the Save on Energy website and related tools and limited advertisements across various social media platforms to re-engage the market. The IESO program staff indicated the social media outreach was very effective in generating new leads during the time it was performed.

On the Save on Energy website, a new lead generation form was added, which contained a link for interested customers to submit their contact information and specify the measures they were interested in. The form's contents were forwarded to the delivery vendor for follow-up. The delivery vendor mentioned this had helped generate interest in the program.

4.2.5 Barriers and Opportunities

Both the IESO program staff and delivery vendor staff indicated the program's delivery progressed well in 2020 despite the challenges associated with COVID-19. The IESO staff reported the program exceeded their expectations in terms of the effective response of the delivery vendor under challenging circumstances. They indicated the delivery vendor informed their network of assessors and installers on which regions were under lockdown. They were also swift to start or stop program delivery in response to the changing restrictions across the province.

According to the IESO program staff, it will be critical to ensure that sufficient supplier and installation networks are available in the market to maintain adequate stock of available equipment in the future. They indicated the pandemic created challenges associated with stocking, which led to longer lead times for some equipment installations and lower satisfaction amongst those customers.

Program delivery vendor staff stated that some of the program-eligible measures were not proving to be cost-effective. It may be beneficial to review them in any future iterations of the program. Additional pandemic-related impediments reported by delivery vendor staff included not being able to serve all customers, reduced staff owing to some employee layoffs, unused inventory, and other administrative and organizational challenges. Despite these obstacles, the vendor stated that they were able to reach their delivery targets after the province reopened later in the year.

The IESO program staff stated it would be important for the program delivery vendor to institute strong lead planning and generation strategies in the future to ensure a robust customer list of prospective participants is available to them. Delivery vendor staff indicated their awareness of the importance of a strong lead planning process, and as described in Section 4.2.3 and Section 4.2.4, they are expanding their networks of program partners and customer leads through various channels.

4.3 Assessor and Installer Perspectives

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

4.3.1 Key Findings

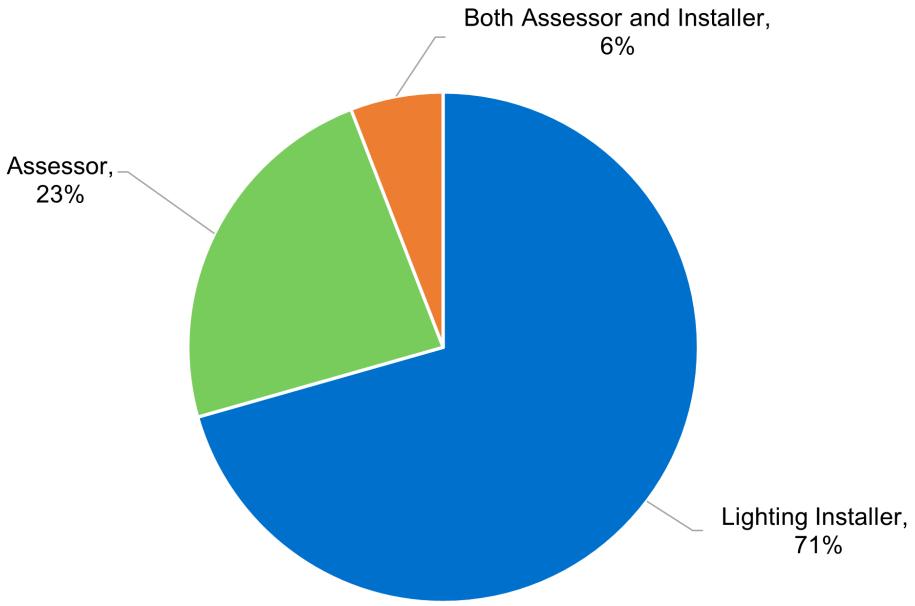
Key findings from the assessor's and installer's responses include the following:

- The majority of survey respondents (71%) were lighting installers. The remainder were either assessors (23%) or both assessors and installers (6%).
- Many respondents received training related to the SBL program via webinars or online instruction (47%) or from one-on-one in-person instruction from the program delivery vendor (35%), while 24% indicated they did not receive program training.
- Respondents received training on a variety of topics, including installation procedures and practices (77%), program rules (69%), program offerings (69%), marketing and outreach techniques (38%), and the application process (38%).
- About three-fifths (59%) 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, 71% of assessors and installers reported a key barrier was the lack of customers' knowledge about the program.
- Over two-thirds (67%) of respondents who had suggestions for program improvements mentioned a form of increased advertising (social media, bill inserts, online).
- Most respondents (94%) were completely or mostly satisfied with the overall program.
- Of about seven-tenths (71%) of respondents who provided suggestions, one-half (50%) suggested the program expand its lighting offerings.
- Other common improvement suggestions included increasing advertising efforts (33%), increasing the margin that installers receive for completing the work (8%) and reducing the reimbursement time for installers (8%).
- Slightly over two-fifths (41%) of respondents reported less work becoming available due to the COVID-19 crisis.

4.3.2 Firmographics

Respondents were asked various questions to better understand their roles in the SBL program. All (100%) of the respondents reported being hired by the program delivery vendor. Nearly three-fourths (71%) of survey respondents were lighting installers, 23% were program assessors, and 6% were both an assessor and an installer (Figure 4-1).

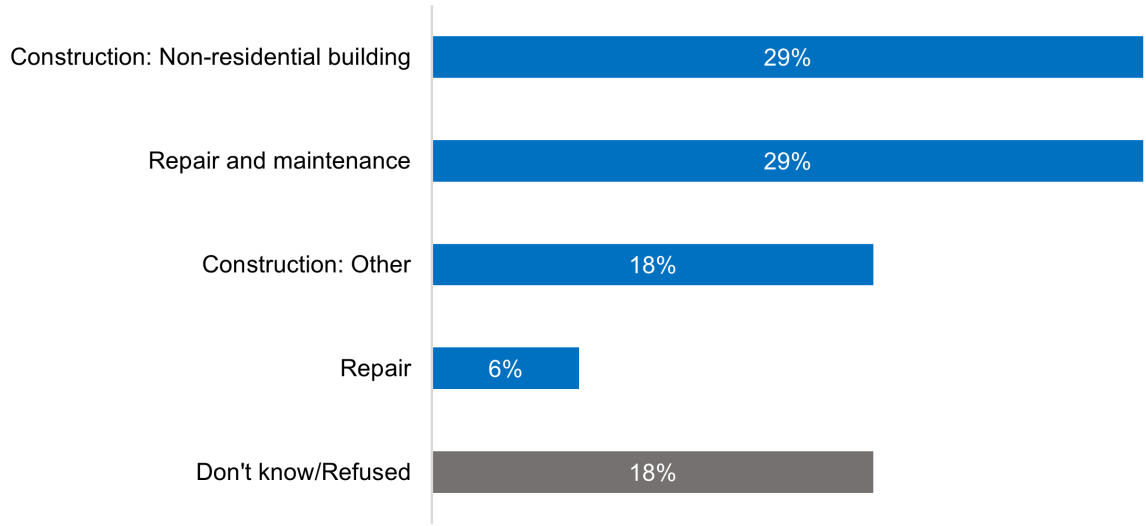
Figure 4-1: Respondents' Company's Role(s) in the SBL Program (n=17)



Slightly less than one-half (47%) of respondents reported working for firms in the construction industry, while under two-fifths (35%) work for firms performing repair and maintenance (Figure 4-2).

Figure 4-2: Respondents' Business Category

(Multiple responses allowed; n=17)



Most respondents worked at companies with one to ten full-time employees (42%) and one to ten part-time employees (42%) (Table 4-2).

Table 4-2: Respondents' Full- and Part-Time Employees (n=14)

Number of Employees	Full-Time	Part-Time
0	0%	21%
1-10	42%	42%
11-30	21%	0%
31-100	0%	0%
101+	0%	0%
Don't know/Refused	37%	37%

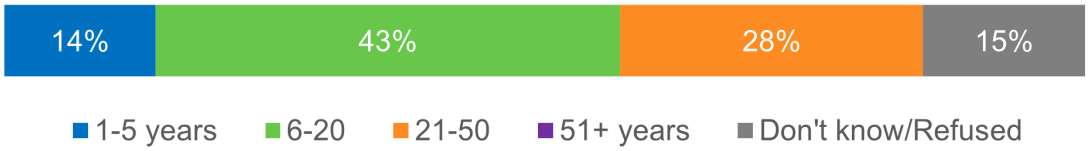
On average, respondents indicated that, including themselves, 4.9 staff members at their company provided services or support for the 2020 SBL program (Table 4-3).

Table 4-3: Staff Involved in 2020 (n=14)

Average	Median	Minimum	Maximum
4.9	4.5	1	10

About three-fourths (71%) of respondents worked at companies that have been in business for six years or more (Figure 4-3).

Figure 4-3: Respondents' Company's Age (n=14)



4.3.3 Project Background

Most respondents (53%) reported having previously performed assessments and/or installations for the SBL program under the Conservation First Framework (CFF), while 29% did not, and 18% did not provide a response.

On average, in 2020 and as part of the Interim Framework (IF), responding assessors completed 513 assessments, and responding installers completed 196 projects.

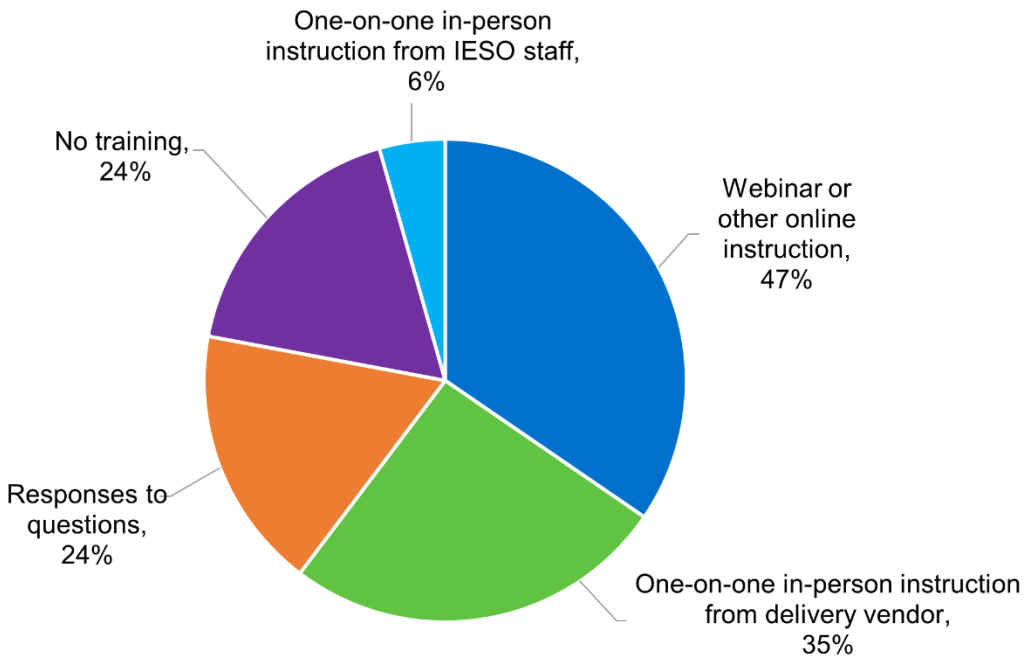
Two responding installers provided an estimate for the percentage of their total sales represented by their 2020 SBL work. One installer indicated the program represented 95% of their total sales, and the other indicated it represented 90% of their total sales.

4.3.4 Training and Education

Close to one-half (47%) of respondents received the SBL program training and education via a webinar or other online instruction. Almost two-fifths (35%) received one-on-one in-person instruction from the program delivery vendor, and 24% received clarifications to inquiries from the program delivery vendor or the IESO. A total of 24% of respondents did not receive any training, and 6% of respondents received one-on-one in-person instruction from the IESO staff (Figure 4-4).

Figure 4-4: Type of Training and Education Received

(Multiple responses allowed; n=17)*

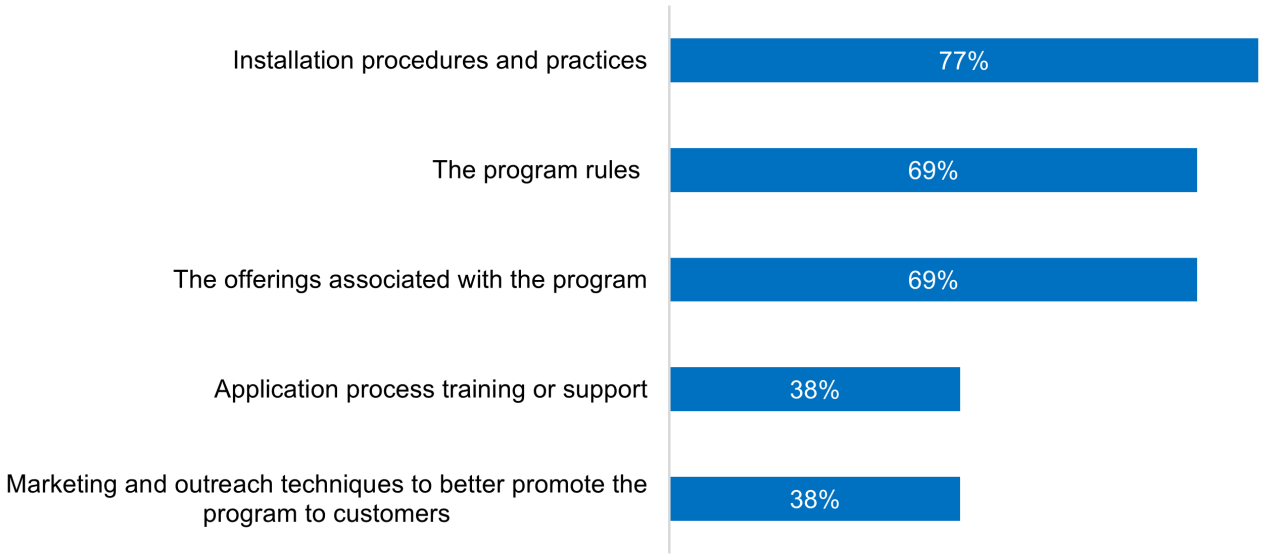


*Does not sum to 100% due to multiple response.

Of the 13 respondents who received training for the SBL program, slightly over three-fourths (77%) received information on installation procedures and practices, slightly more than two-thirds (69%) received information on the program rules, and slightly more than two-thirds (69%) received information on program offerings. An equal number of respondents were trained on marketing and outreach techniques and the application process (38% each, respectively) (Figure 4-5).

Figure 4-5: Topics Covered in Trainings

(Multiple responses allowed; n=13)*

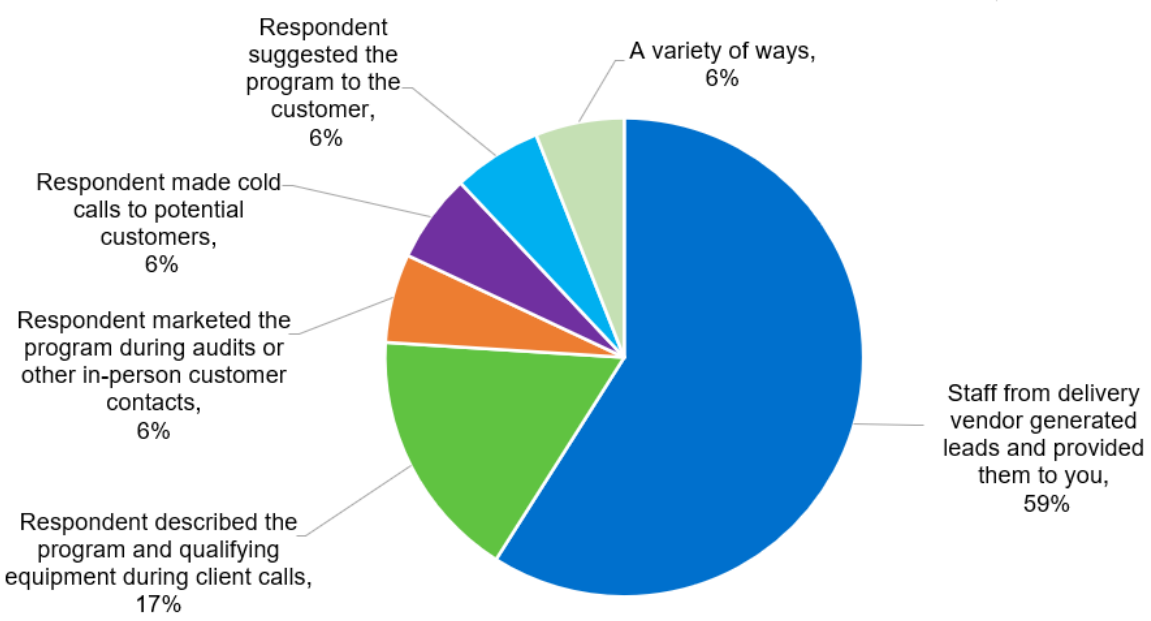


*Does not sum to 100% due to multiple response.

4.3.5 Customer Participation

About three-fifths (59%) 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 4-6).

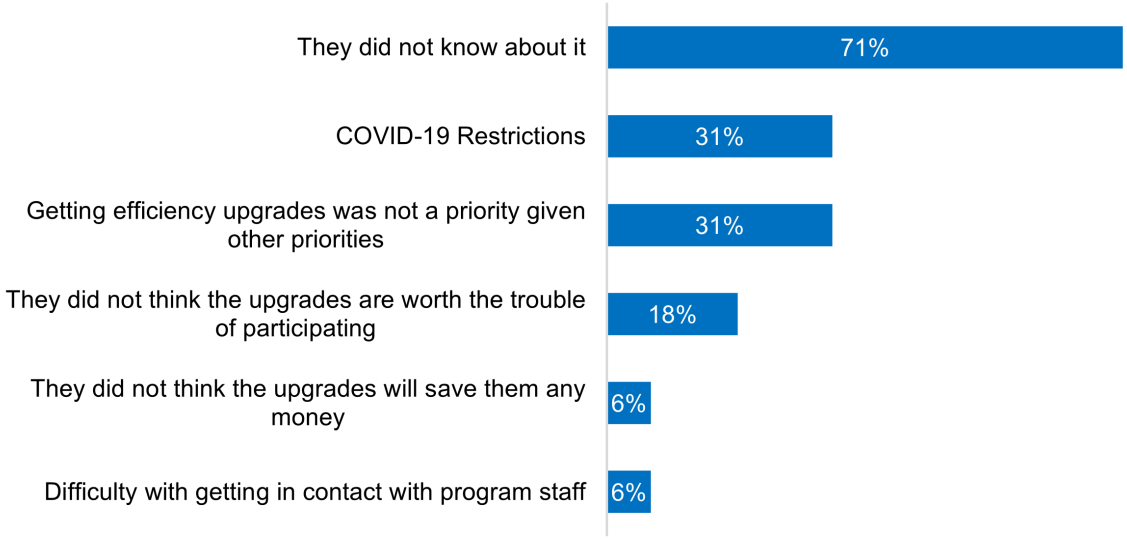
Figure 4-6: Primary Way Customers Came to Participate According to Assessors and Installers (n=17)



Slightly less than three-fourths (71%) of respondents indicated that customers being unaware of the program prevents them from participating. Other frequently mentioned barriers included COVID-19 pandemic-related restrictions (31%), efficiency upgrades not being a priority for customers (31%), and customers deeming the upgrades not worth the trouble (18%) (Figure 4-7).

Figure 4-7: Barriers to Participation

(Open end and multiple responses allowed; n=17)*



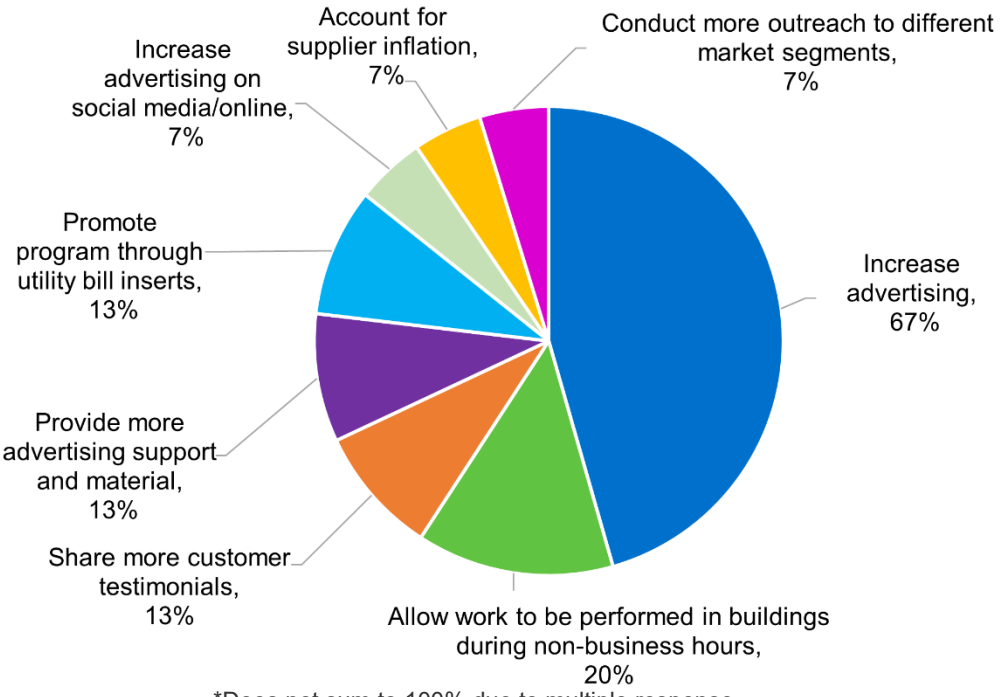
*Does not sum to 100% due to multiple response.

About one-tenth (12%) of respondents did not provide suggestions for addressing program participation barriers. As seen in Figure 4-8, of the close to nine-tenths (88%) of respondents who provided suggestions,

- Two-fifths (67%) mentioned increasing advertising in general,
- One-fifth (20%) mentioned it would be helpful if installation work could be performed in buildings during non-business hours,
- Just over one-tenth (13%) mentioned more sharing more customer testimonials,
- Just over one-tenth (13%) mentioned providing more advertising support and material, and
- Just over one-tenth (13%) mentioned providing advertisements via bill inserts.

Figure 4-8: Suggestions to Address Barriers to Participation

(Open end and multiple responses allowed; n=15)



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

4.3.6 Program Satisfaction

Respondents provided feedback on their level of satisfaction with various program aspects (Figure 4-9). They rated each aspect on a scale from one (1) to five (5), where one indicates "not satisfied at all" and five indicates "extremely satisfied."

Respondents gave the highest ratings to:

- the SBL program overall with (94% with a rating of 4 or 5)
- the training and education they received (84% with a rating of 4 or 5), and
- the program worksheets (82% with a rating of 4 or 5).

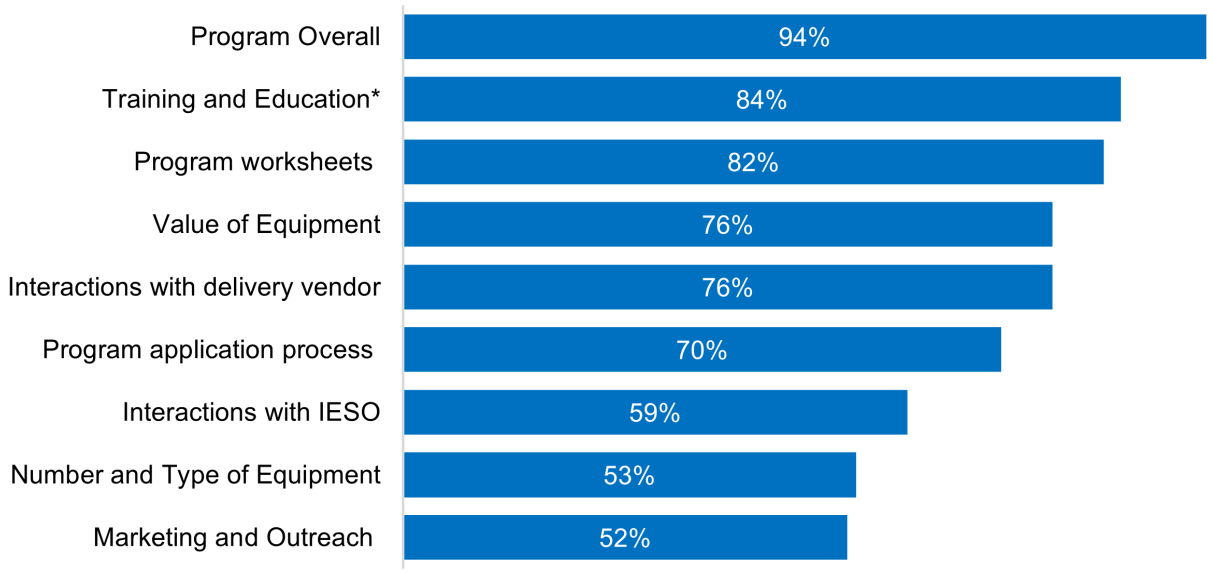
Respondents gave the lowest ratings to:

- the number and types of equipment incentivized (53% with a rating of 4 or 5) and
- marketing and outreach (52% with a rating of 4 or 5).

This suggests that it may be valuable for the program to revisit the eligible equipment and the marketing and outreach.

Figure 4-9: Assessor and Installer Satisfaction (n=17)

(Rating of 4 or 5 on a scale from 1 to 5)



*Respondent count for "Training and Education" is 13 since only respondents who indicated receiving trainings and education were asked to rate their satisfaction with it.

4.3.7 Improvement Suggestions

Respondents were asked to suggest areas of improvement for the SBL program. Close to three-tenths (29%) of respondents did not provide suggestions. Of about seven-tenths (71%) of respondents who provided suggestions, one-half (50%) suggested the program expand its lighting offerings to include outdoor lighting, signage lights, parking lot lighting, 8' T12 and T8 tubes, and integrated lighting control options (Table 4-4). Additional detail about recommended lighting types can be found in Appendix D.2. Other common responses included increasing advertising efforts (33%), increasing the margin that installers receive for completing the work (8%) and reducing the reimbursement time for installers (8%).

Table 4-4: Areas for Improvement

(Open end and multiple responses allowed; n=12)*

Suggested Areas of Improvement	Respondents
Expand lighting offerings	50%
Increase advertising efforts	33%
Increase margins for installers	8%
Reduce the reimbursement time for installers	8%
Increase incentive offerings	8%
Allow contractors to conduct assessments	8%
Improve the delivery vendor's lead generation processes	8%
Include the need for manual lifts into program design	8%
Facilitate communication between assessors and installers for large projects	8%
Ensure only high-quality products are eligible for the program to minimize warranty issues	8%

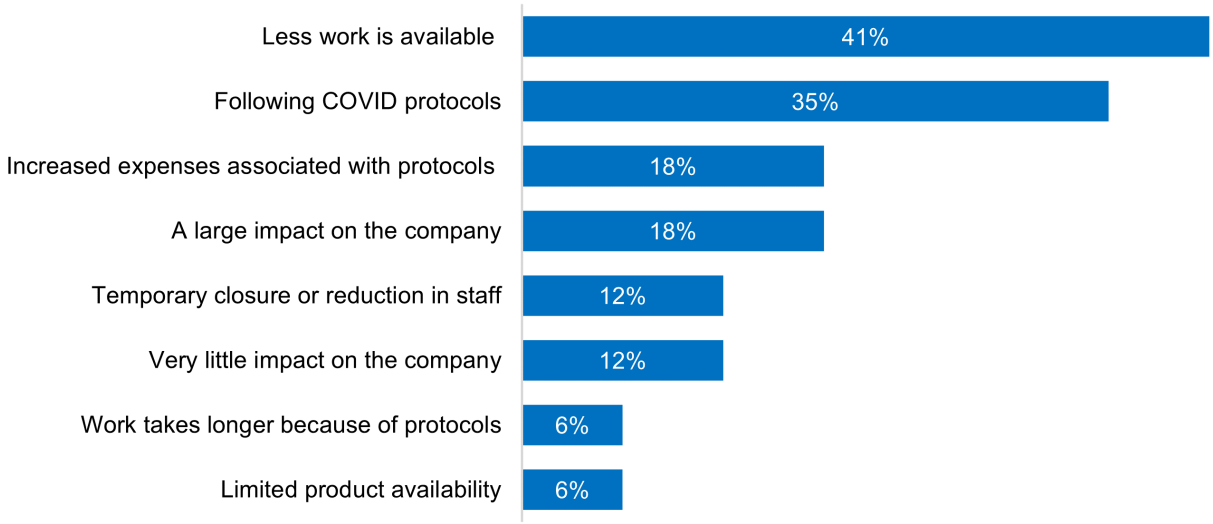
*Does not sum to 100% due to multiple response.

4.3.8 COVID-19 Crisis

Respondents were asked to describe how the COVID-19 pandemic affected their company and its operations, if at all. Just over two-fifths of the respondents (41%) noted their businesses have seen less work become available. Over three-tenths (35%) explained they are following current COVID-19 protocols, and slightly less than two-fifths each cited increased expenses associated with following protocols (18%) or that the pandemic has had a large impact on their company (18%) (Figure 4-10).

Figure 4-10: Changes to Business Operations Due to COVID-19

(Open end and multiple responses allowed; n=17)*



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

4.4 Participant Perspectives

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

4.4.1 Key Findings

Key findings from participants' responses include the following:

- The majority of survey respondents had no suggestions for improving the initial site assessment (82%), the installer visit(s) (74%), or the overall installation process (90%). 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 reduce the time it takes to complete the visits, improve the assessor or installer's professionalism, and provide more flexibility in scheduling the visits.
- Over four-fifths (81%) of respondents had not applied to other energy-efficiency programs in 2020 besides the SBL program, and nearly one-tenth (8%) had applied to the Retrofit program.
- Nearly three-fourths (74%) of respondents who were recommended additional lighting upgrades installed them.
- Over one-third (34%) of respondents who installed smart thermostats stated they used the thermostats to set temperature schedules.
- More than two-fifths (43%) of respondents reported their businesses were very affected, seriously affected, and/or closed due to the COVID-19 crisis.

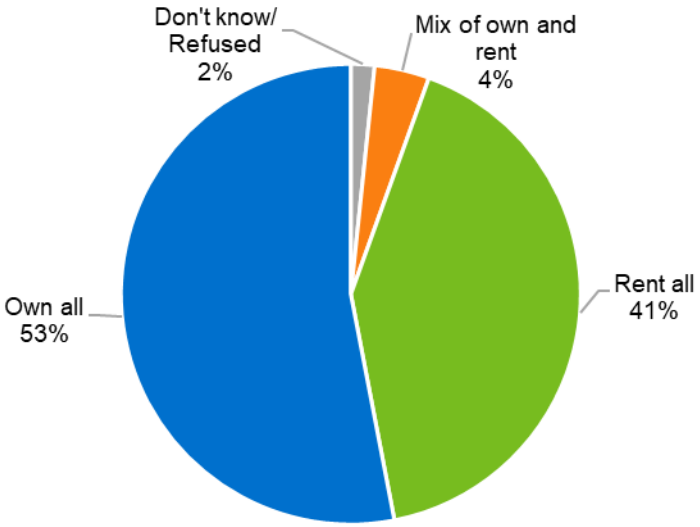
4.4.2 Firmographics

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) was also gathered during the survey.

Over two-thirds of survey respondents (71%) were owners or presidents of their companies, while one-fifth (20%) were managers. Almost two-thirds (63%) were the primary employee responsible for the SBL lighting upgrades, and one-third (33%) shared the responsibility.

Most (53%) participating companies owned the property where the program upgrades were conducted, but more than two-fifths (41%) rented the property (Figure 4-11).

Figure 4-11: Ownership Status (n=182)



The facilities served by the program were mainly in the retail and wholesale sector (23%) (Table 4-5). The next most common sectors were repair, maintenance, and operations (11%), lodging and food service (9%), and agriculture, forestry, husbandry, mining, and extraction (9%). Over nine out of ten respondents (91%) stated their company was not part of a franchise or chain.

Table 4-5: Primary Activity at Facility(ies)
(Multiple responses allowed; n=182)*

Primary Business Categories	Respondents
Retail and wholesale	23%
Repair, maintenance, and operations	11%
Lodging and food service	9%
Agriculture, forestry, husbandry, mining	9%
Manufacturing	7%
Healthcare services	7%
Non-profit	5%
Arts, entertainment, recreation, advert	4%
Construction	2%
Educational services	2%
Finance, insurance, real estate, and property management	1%
Government services	1%
Scientific, technical, and information	1%
Transportation and warehousing	<1%
Other services	17%

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

Participants were asked to provide the square footage of the project facilities. If multiple facilities received lighting upgrades, participants were asked to provide the total square footage for all of them (Figure 4-12). More than one-half (55%) of respondents stated the total square footage of their facility(ies) was between 1,001 and 5,000 square feet.

Figure 4-12: Total Square Footage for All Buildings (n=182)

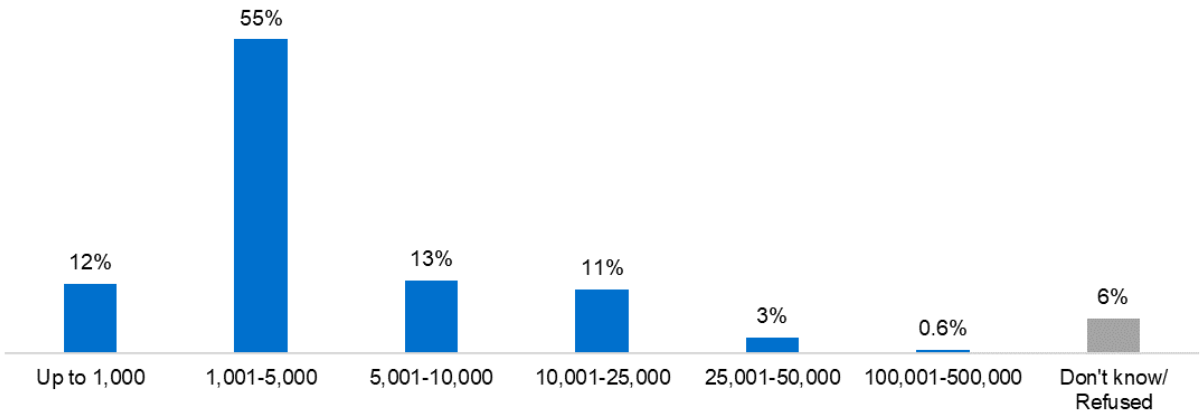


Table 4-6 presents the survey respondents' participation in other business programs offered by the IESO in 2020. Nearly one-tenth (8%) participated in the Retrofit program, and one in fifty (2.6%) participated in another program.

Table 4-6: Participation in Other Business Programs in PY2020
(Multiple responses allowed, n=182)*

Other Programs	Percent Participated
Retrofit Program	8%
Refrigeration Efficiency Program	2%
Process and Systems Upgrades (PSU) Program	0.5%
Energy Manager Program	0%
Energy Performance Program	0%
Don't know/Refused	9%
No other programs	81%

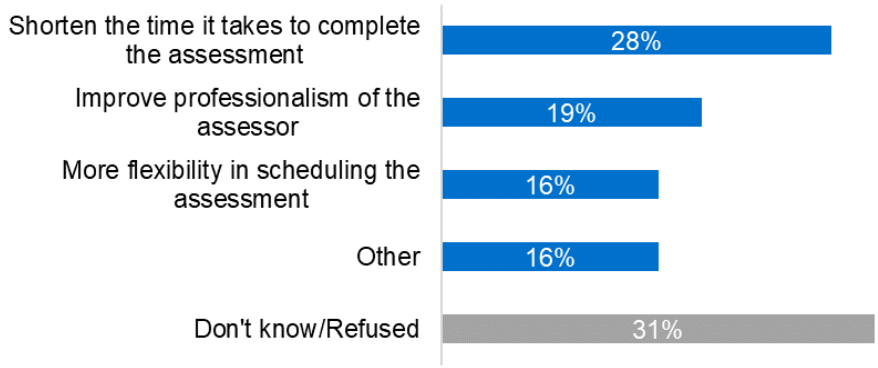
*Does not sum to 100% due to rounding.

4.4.3 Improvement Suggestions

More than four-fifths (82%) of respondents had no suggestions for improving the initial site assessment visit, indicating that the majority were satisfied with the work done by their assessor. Of the one-fifth (18%) of respondents who had a suggestion, the most common responses were to reduce the time it takes to complete the assessment (29%), improve the assessor's professionalism (19%), and provide more flexibility in scheduling the assessment (16%) (Figure 4-13).

Figure 4-13: Suggestions for Improving the Initial Site Assessment Visit

(Open ended and multiple responses allowed; n=33)*



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

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

- Better communication between the assessor and installer (2 respondents)
- Improve program and technical knowledge of the assessor (1 respondent)
- Increase measure offerings for initial assessment (1 respondent)
- Shorten the time between the assessment and the installer visit (1 respondent)

Table 4-7 shows the feedback from five respondents who suggested improvements to address the professionalism of the assessor. The most common suggestion was transparency from the assessor about the work being performed (4 respondents).

Table 4-7: Suggestions for Improving Assessor Professionalism

(Open end and multiple response allowed; n=5)

Improvement Suggestions for Initial Site Assessment Visit	Respondents
Transparency about work performed	4
Responsiveness to questions or concerns	2
Increase assessor familiarity with different needs associated with the various businesses that participate in the program	1
Respect for our company's time during the visit	1
Respect for our company's business practices during the visit	1
Politeness/business etiquette	1

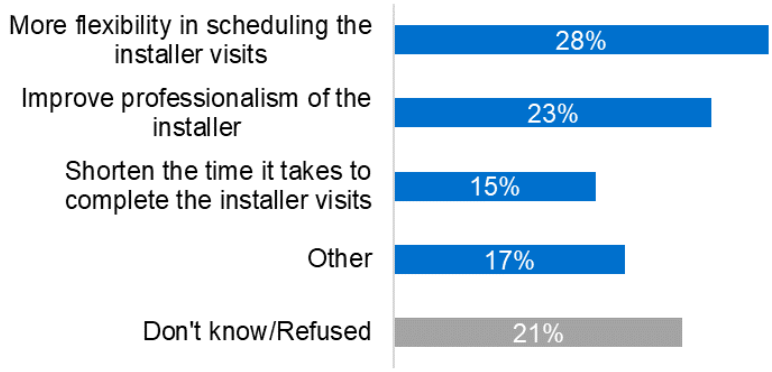
*Counts displayed rather than percentage due to small n.

Nearly three-fourths (74%) 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 (26%) of respondents who had a suggestion, the most common responses were to

provide greater flexibility when scheduling the installer visit(s) (28%), improve the installer's professionalism (23%), and reduce the time it takes to complete the visit(s) (15%) (Figure 4-14).

Figure 4-14: Suggestions for Improving Program Installer Visits

(Multiple response allowed; n=47)*



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

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

- Better communication between the assessor and installer (3 respondents)
- Ensure installers return to finish the work (3 respondents)
- The installer should start and complete work within the scheduled time (1 respondent)
- Use local contractors (1 respondent)
- Improve site cleanup (1 respondent)
- Ensure the installer does not damage property during installation (1 respondent)

Table 4-8 presents the feedback from seven respondents who suggested improvements to address the installer's professionalism. The most common suggestion was improving the installer's responsiveness to questions or concerns (4 respondents).

Table 4-8: Suggestions for Improving Installer Professionalism

(Open end and multiple response allowed; n=8)*

Improvement Suggestions for Overall Installation Process	Respondents
Responsiveness to questions or concerns	4
Transparency about work performed	1
Increase installer familiarity with different industries	1
Respect for our company's business practices during the visit	1
Politeness/business etiquette	1
Don't know	1

*Counts displayed rather than percentage due to small n.

Nine-tenths (90%) of respondents did not have suggestions for improving the overall installation process, indicating a high level of satisfaction with the program. As presented in Table 4-9, various responses were provided by the one-tenth (10%) of respondents who had a suggestion.

Table 4-9: Suggestions for Improving the Installation Process Overall
(Open end and multiple response allowed; n=19)*

Improvement Suggestions for Overall Installation Process	Respondents
Ensure the installer does not rush the installation	2
Improve site cleanup	2
Better communication between the assessor and installer	2
Other	7
Don't know/Refused	6

*Counts displayed rather than percentage due to small n.

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

- Use local contractors (1 respondent)
- Improve assessor responsiveness (1 respondent)
- Increase installer familiarity with different industries (1 respondent)
- Installer to minimize disruptions to business (1 respondent)
- Ensure the installer does not damage property during installation (1 respondent)
- Ensure the installer does not damage fixtures during installation (1 respondent)
- Increase marketing and promotion of energy savings programs (1 respondent)

Almost nine in ten respondents (86%) mentioned there were no disruptions to their business as a result of the project installation. As presented in Table 4-10, a small number of respondents reported disruptions to their business, with the most common disruptions including scheduling their business' regular activities around the assessor and installer appointments (5 respondents) and having to close sections of the business for appointments (3 respondents).

Table 4-10: Disruption to Business Operations Due to the SBL Program
(Open end and multiple response allowed; n=20)*

Disruptions to Business	Respondents
Company needed to schedule business around appointments	5
Sections of the business needed to close for appointments	3
Business needed to close for appointments	2
Installer improperly disposed of waste from installation	2

Disruptions to Business	Respondents
Lighting is too bright	1
Had problems turning lights on after installation	1
Installer cut out a power line	1
Property damaged by installer	1
Appointment scheduled on short notice	1
Multiple visits needed to complete installation	1
Assessor/installer arrived later than promised	1
Had to move furniture to make room for installation	1

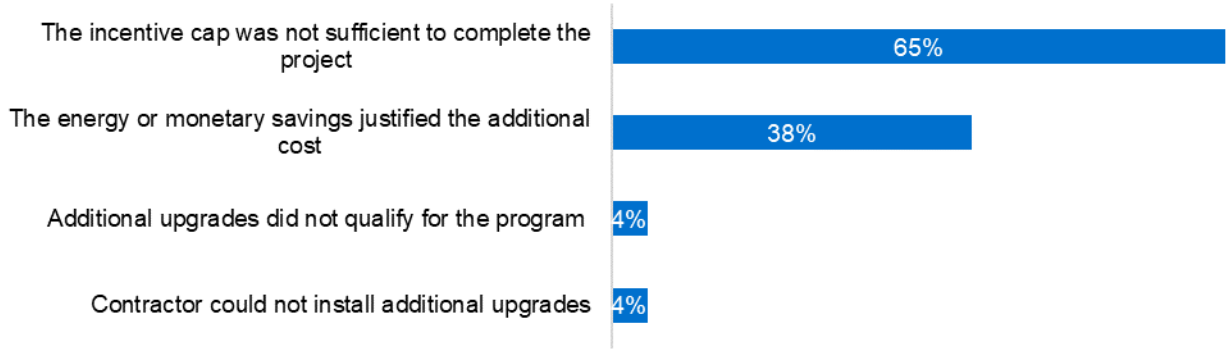
*Counts displayed rather than percentage due to small n.

4.4.4 Additional Lighting Upgrades

Nearly one-fifth of respondents (19%) stated they were offered additional lighting upgrades that exceeded the $2,000 incentive cap. Of the respondents who were offered additional lighting upgrades, almost three-fourths (74%) agreed to install them. The most common reasons, presented in Figure 4-15, were the incentive cap was not sufficient to complete the project (65%), and the energy or monetary savings justified the additional cost (38%). One respondent stated their additional upgrades did not qualify under the program. Another respondent stated the contractors did not have the available equipment to perform the extra upgrades upon request.

Figure 4-15: Decision to Install Additional Lighting Upgrades

(Open end and multiple response allowed; n=32)*



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

The nine respondents who did not decide to install the additional lighting upgrades mentioned that it was cost-prohibitive (4 respondents), that they did not need to install additional lighting upgrades (4 respondents) or refused the question (1 respondent).

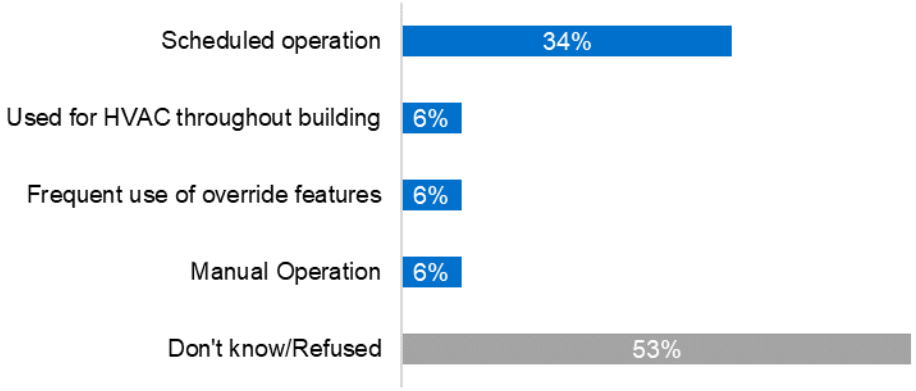
4.4.5 Control Equipment

Participants were asked to describe how their control equipment was used. Of the one-fifth (18%) of respondents who installed smart thermostats at their facility(ies), the most common

response was to schedule operations (34%). Other responses included using the smart thermostat(s) for HVAC throughout the building (6%), frequent use of override features (6%), and manual operation (6%) (Figure 4-16).

Figure 4-16: Use of Smart Thermostats

(Open end and multiple response allowed; n=32)



More than one in ten respondents (12%) stated they installed lighting controls at the facility(ies). As presented in Table 4-11, the most common use for lighting controls were on/off controls (4 respondents).

Table 4-11: Use of Lighting Controls

(Open end and multiple response allowed; n=22)

Use of Lighting Controls	Respondents
On/off controls	4
Occupancy controls	3
Dimmer controls	3
Timer controls	1
Don't know/Refused	12

*Counts displayed rather than percentage due to small n.

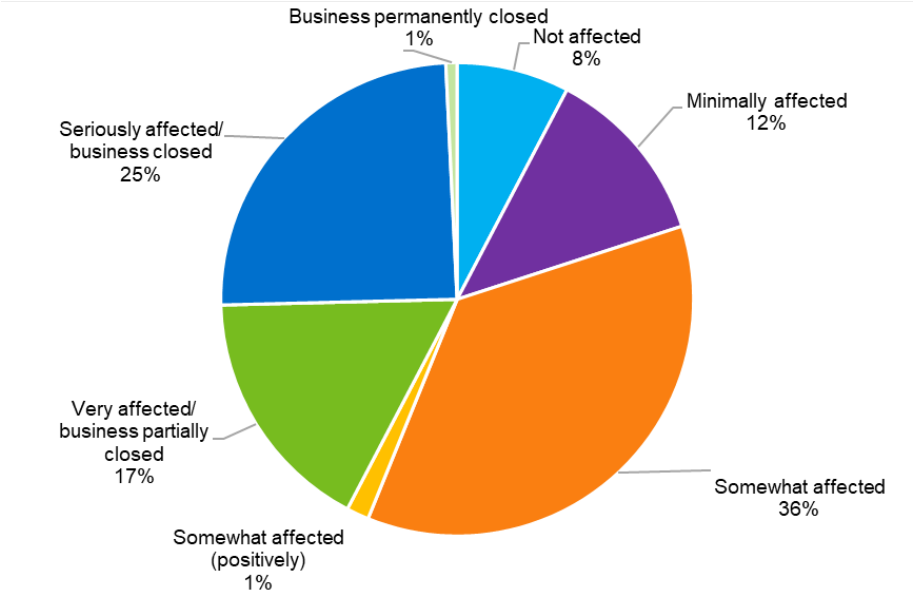
Fewer than one in ten respondents (8%) stated they installed advanced HVAC controls at their facility(ies). One respondent stated they used manual thermostat controls for their electric furnace and air conditioner. The remaining 13 respondents did not know or refused to provide a response.

4.4.6 COVID-19 Pandemic and Health/Safety

Respondents were asked an open-ended question about how the COVID-19 pandemic had impacted their company and its operations (Figure 4-17). They reported various effects from the COVID-19 pandemic. More than two-fifths (43%) of respondents reported their businesses were very affected, seriously affected, and/or closed due to the COVID-19 crisis.

Figure 4-17: Impacts to Business Operations of COVID-19

(Open end; n=130)



Participants were asked to rate how closely the Save on Energy program representatives (i.e., assessors, installers) adhered to the relevant health and safety standards associated with the COVID-19 pandemic. They rated the representative's adherence on a scale from one (1) to five (5), where one indicates "did not adhere at all" and five indicates "adhered completely." More than eight in ten (86%) participants stated assessors and installers adhered to health and safety standards (Figure 4-18). Respondents who provided lower ratings did not have any suggestions on improving the assessor and installer adherence to health and safety standards.

Figure 4-18: Adherence to Health and Safety Standards

(Rating of 4 or 5 on a scale of 1 to 5; n=182)

4.5 Process Evaluation Findings and Recommendations

Finding 1. Program free-ridership (FR) was low in 2020, relative to historical results, at 5.6%. The program's NTG was high at 99.1%, with a correspondingly low FR score at 5.6%. More than two-fifths (46%) of participants were not planning on upgrading their lighting prior to learning about the program. Of those already planning on upgrading their lighting, almost two-fifths (39%) would have waited at least one year, and almost one-third (32%) would have installed less expensive or less efficient lighting without the program. More than one-tenth (14%) would have installed the same lighting equipment and paid the full cost themselves, which is

indicative of some level of FR. The low FR indicates the program is mainly reaching the participants who would not have made lighting upgrades without the program.

- ***Recommendation 1.*** *Maintain focus on minimizing FR. Key areas include:*
    - *identifying and targeting customers who would not make upgrades without program support,*
    - *screening customers to ensure they have not already begun implementing measures, and*
    - *encouraging all participants to complete the evaluation surveys to ensure that the FR results are as representative of the true population of program participants as possible.*

Please note that Recommendation 1 was included in the PY2019 evaluation as well. In response to the recommendation in PY2019, the IESO indicated that they would "continue to identify and support businesses and projects that require the program to proceed with implementing energy-efficient measures" and that they had "instructed its program delivery vendor to specifically target independently-owned small businesses through outreach efforts." Given the low FR in PY2020, the program appears to be appropriately identifying and targeting customers who are most in need of the program's support. However, given the critical importance of minimizing FR, this recommendation is provided again to ensure that it continues to be carefully considered in future program years.

Finding 2. Many participants who were recommended additional lighting upgrades beyond the program upgrades made those upgrades. Nearly three-fourths (74%) of participants who were recommended additional lighting upgrades installed them. However, some participants who wanted the additional lighting upgrades installed at the same time as the program upgrade installation stated this was not possible because the installer did not have the available equipment.

- ***Recommendation 2.*** *Assist participants who are interested in installing additional lighting upgrades beyond those covered by the SBL program by consulting with customers and installers regarding the potential of having those upgrades completed concurrently with the SBL program-qualified upgrades.*

Finding 3. Expanding the scope of lighting offerings was the most common improvement suggestion mentioned by assessors and installers. Assessors and installers were least satisfied with the number and types of equipment incentivized (53% satisfied or very satisfied). Additionally, the most commonly cited area of program improvement was expanding the scope of lighting offerings. Assessors and installers highlighted the need for outdoor lighting and

signage offerings, particularly wallpacks, floodlights, and poles. Some assessors and installers also specifically mentioned the addition of 8-foot T8 lamps.

- ***Recommendation 3.*** *Explore the feasibility of including more program lighting products (for example, outdoor lighting and signage offerings, 8-foot T-8 lamps).*

Finding 4. Participant perspectives on the program and its processes were positive overall, but there were some suggestions for program improvement provided by a subset of respondents.

The majority of participants had no suggestions for improving the initial site assessment (82%), the installer visit(s) (74%), or the overall installation process (90%), which suggests a high level of satisfaction with the program. Of those with suggestions for improvements, the most common were to reduce the time it takes to complete the assessor and installer visits, improve the assessor or installer's professionalism (such as being more transparent about work performed and improving responsiveness to questions), and provide more flexibility in scheduling the visits.

- ***Recommendation 4a.*** *Reduce the time it takes to complete the assessment and installer visits. Identify areas where additional program support or resources could* allow the assessors/installers to complete this task more promptly.

- ***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, coordinating with participants to identify suitable times for the visit and providing accurate arrival windows).*

Please note that Recommendation 4a through 4c were included in the PY2019 evaluation as well. In response to the recommendation in PY2019, the IESO indicated that they would continue to identify methods to improve customer satisfaction, including increasing scheduling flexibility, professionalism, and addressing installation time issues. They also noted that additional precautions were implemented to support businesses during the pandemic and that they would continue to administer customer satisfaction surveys to monitor the customer experience. Given that similar improvement suggestions were raised by participants as part of the PY2020 evaluation to those raised in PY2019 and given the critical importance of the customer experience overall, these recommendations have been provided again to ensure that they continue to be carefully considered in future program years.

Finding 5. Additional cross-program promotion opportunities exist. Less than one in ten (8%) of SBL participants had also participated in the Retrofit program in 2020, and one in fifty (2%) participated in the Refrigeration Efficiency Program (REP).

- **Recommendation *5.*** *Continue to identify cross-program promotion opportunities, which can be achieved through two means. Firstly, promoting other program opportunities to all participating SBL customers at both the start and end of the participation process. Secondly, ensuring that participating SBL customers are aware of the other program opportunities designed with their business segment in mind.*

Please note that a similar recommendation to Recommendation 5 was included in the PY2019 evaluation. In response to the recommendation in PY2019, the IESO indicated that cross-program opportunities would continue to be identified to support businesses. They also noted that a network had been established between the SBL and Retrofit program delivery vendors to share qualified leads for the respective programs. Given that participation in other programs was still very low as reported by the surveyed SBL participants in PY2020, this recommendation has been provided again to ensure that it continues to be carefully considered in future program years.

Finding 6. Opportunities exist to expand program marketing. Assessors and installers emphasized the importance of promoting the program more to potential customers. Respondents cited different modes of communication to promote the program, including social media, the internet, among others.

- **Recommendation 6.** Increase marketing efforts across different platforms (e.g., social media, online, and through community groups such as small business associations.

5 Job Impacts

This section presents the results of the job impact analysis, as summarized in Table 5-1. As the two right columns indicate, the analysis estimated that the SBL program would create 140 total jobs in Canada, with 124 jobs created in Ontario. Of the 140 estimated total jobs, 75 are direct jobs, 29 are indirect jobs, and 35 are induced. In terms of FTEs, the numbers are slightly lower, with 103 FTEs created in Ontario and 116 FTEs created nationwide. Of these 116 FTEs, direct jobs account for 64 FTEs, 26 FTEs are indirect jobs and 25 FTEs are induced jobs. In total, the SBL Program created 32.2 jobs per million dollars of investment (i.e. program budget).

Table 5-1 : Summary of Total Job Impacts

Job Impact Type	FTE *(in person-years)*		Total Jobs *(in person-years)*		Total Jobs per $1M Invested *(in person-years)*
	Ontario	Total	Ontario	Total	
Direct	61	64	72	75	17.3
Indirect	21	26	24	29	6.8
Induced	20	25	28	35	8.2
Total	**103**	**116**	**124**	**140**	**32.2**

Section 5.1 details the values of the inputs used in the model runs. Section 5.2 presents the analysis results, including the details of job impacts and assumptions.

5.1 Inputs

The model was used to estimate the impacts of three economic shocks:

- The demand shock, representing the demand for energy-efficient products and services from SBL
- The business reinvestment shock, representing the increased business reinvestment due to bill savings (and net of project funding)
- The household expenditure shock, representing decreases in household spending on goods and services due to increases in the residential portion of program funding.

Table 5-2 below displays the input values for the demand shock representing the products and services related to SBL. 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 5-2 contain the categories corresponding to products, which were the measures installed in businesses. The last row contains the services. Lighting fixtures had the highest total cost of the two product categories and accounted for $3.2 million of the overall program cost. The other product category, Electric light bulbs and tubes, had $0.5 million of total costs. The similarities of the product categories reflect the relatively narrow range of measures typically installed as a part of SBL, compared to other programs such as Commercial Retrofit. Each measure's cost was divided into labour and non-labour, as the IO Model required this

distinction to determine direct versus indirect impacts. Program implementers were asked to estimate the approximate split between labour and non-labour costs. Program implementers stated that, on average, 47% of a project's cost is spent on labour. This estimate was used as the labour portion for the model input.

The single service category in Table 5-2, 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 has built-in assumptions for this category.

Table 5-2: Summary of Input Values for Demand Shock

Category Description	Non-Labour	Labour	Total Demand Shock
	($ Thousands)		
Lighting fixtures	1,688	1,497	3,185
Electric light bulbs and tubes	272	241	513
Subtotal	**1,960**	**1,738**	**3,697**
Office administrative services	-	-	973
Total			**4,670**

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 ($18.6 million) was the net of electricity bill savings (NPV = $18.9 million), and the portion of project costs not covered by incentives ($0.3 million). The portion of this $18.6 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 and the type of business. Overall, respondents indicated that 76% of bill savings would be reinvested ($14.1 million). The remaining savings would either be used to pay off debt or disbursed to owners/shareholders.

To properly model the effects of the business reinvestment shock, 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 5-3 presents the input values for the business reinvestment shock by industry. The total business expenditure shock would be $14.1 million over 26 industries, as shown in the table.

Table 5-3: Summary of Input Values for Business Reinvestment Shock

Category Description	Business Reinvestment Shock *($ Thousands)*
Retail trade	2,286
Other	1,811
Crop and animal production	1,499
Accommodation and food services	1,440
Repair, maintenance and operating and office supplies	1,124
Other services (except public administration)	1,037
Health care and social assistance	970
Non-profit institutions serving households	883
Wholesale trade	624
Arts, entertainment and recreation	346
Professional, scientific and technical services	250
Educational services	187
Advertising, promotion, meals, entertainment, and travel	125
Chemical, soap, plastic, rubber, and non-metallic minerals	125
Crop, animal, food, and beverage	125
Forestry, logging, paper, and printing	125
Furniture, cabinet, and fixtures	125
Machinery	125
Other activities of the construction industry	125
Owner occupied dwellings	125
Repair construction	125
Residential building construction	125
Support activities for agriculture and forestry	125
Transportation and warehousing	125
Other municipal government services	96
Textile and clothing	96
Total	**14,146**

The third model input is the household expenditure shock.[1] This shock represents the incremental increase in electricity bills to the residential sector from funding the program. The

[1] 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.

assumption is that the IESO programs are funded by all customers in proportion to the overall consumption of electricity. Thus, the residential funding portion was 35% of the $4.3M program budget or $1.5M.

5.2 Results

The StatCan IO Model generated results based on the input values detailed in Section 5.1. Table 5-4 shows the results of the model run for the demand shock for products and services. This shock accounts for about two-thirds of job impacts. As the two right columns show, the model estimated that the demand shock will result in the creation of 58 total jobs (measured in person-years) in Canada, of which 54 will be in Ontario. Of the 58 jobs, 35 were direct, 9 indirect and 14 induced. In terms of FTEs the numbers are slightly lower; 45 FTEs were estimated to be created in Ontario and 48 in total across Canada. Of those 48 FTEs, 30 were direct, 8 indirect and 10 induced. Direct jobs impacts were realized exclusively in Ontario, as shown in the table. As we move to indirect and induced jobs, impacts are dispersed outside of the province.

Table 5-4: Job Impacts from Demand Shock

Job Impact Type	FTE *(in person-years)*		Total Jobs *(in person-years)*	
	Ontario	Total	Ontario	Total
Direct	30	30	35	35
Indirect	6	8	7	9
Induced	9	10	12	14
Total	**45**	**48**	**54**	**58**

Table 5-5 shows the results of the model run for the business reinvestment shock. Job impacts generated by business investment were equal to 39 direct total FTEs and 46 direct total jobs. Overall, business investments were responsible for 77 FTEs and 94 total jobs across Canada.

Table 5-5: Job Impacts from Business Reinvestment Shock

Job Impact Type	FTE *(in person-years)*		Total Jobs *(in person-years)*	
	Ontario	Total	Ontario	Total
Direct	36	39	43	46
Indirect	17	21	20	25
Induced	13	17	18	23
Total	**66**	**77**	**81**	**94**

The third shock was the reduction in household spending from the increase in electricity bills to fund the program. Table 5-6 presents the job impacts from the model run. It represents the number of jobs attributed to reduced household spending; this amount could have been spent in other sectors of the economy, but was instead spent on funding the SBL program. The model estimated a reduction of 9 FTEs and 12 total jobs across Canada due to the decreased household spending.

Table 5-6: Job Impacts from Residential Funding Shock

Job Impact Type	FTE *(in person-years)*		Total Jobs *(in person-years)*	
	Ontario	Total	Ontario	Total
Direct	5	5	6	6
Indirect	2	3	3	5
Induced	2	2	2	2
Total	**8**	**9**	**11**	**12**

The non-residential sector also contributes to program funding. The StatCan IO Model does not adjust production functions for all industries experiencing marginally higher electricity price changes, so this portion of the shock would be modeled 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[2]. The relatively small decrease in overall consumption attributed to SBL program savings may work to slow the rate of consumption growth over time, but would likely not result in actual job losses in the utility industry or upstream suppliers. The linearity of the IO model means 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 5-7 shows the total estimated job impacts by type, calculated by combining the jobs estimated in Table 5-4,

Table 5-5, and Table 5-6. Of the 75 estimated total direct jobs, 72 were in Ontario. A slightly smaller proportion of the indirect and induced jobs were in Ontario; 24 out of 29 indirect jobs and 28 out of 35 induced jobs were estimated to be created within the province. The FTE estimates were slightly lower overall than the total jobs, with a total of 103 FTEs (of all types) created in Ontario and 116 FTEs added nationwide. Almost all direct FTEs (61 of 64) were added in Ontario, with this number representing approximately 59% of the total FTEs added in Ontario and 53% of all FTEs created across Canada. In 2020, each $1M of program spend resulted in the creation of 32.2 total jobs compared to 27.1 jobs per $1M in 2019.

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

Table 5-7: Total Job Impacts by Type

Job Impact Type	FTE *(in person-years)*		Total Jobs *(in person-years)*		Total Jobs per $1M investment *(in person-years)*
	Ontario	Total	Ontario	Total	
Direct	61	64	72	75	17.3
Indirect	21	26	24	29	6.8
Induced	20	25	28	35	8.2
Total[1]	**103**	**116**	**124**	**140**	**32.2**

The model does not provide year-by-year results for job impacts, but we are able to make some estimates about the temporal nature of the impacts. Table 5-8 shows the total jobs created due to program activities and energy savings in the first year versus from after the first year. The table assumes that "first year activities" are the initial demand shock for EE products and services, the program funding shock, and the first year energy savings (resulting in bill savings and reinvestment). Job impacts after the first year are due to energy savings over the course of the measures' EULs. Job impacts from first year activities make up roughly 8% of the total, with 12 out of the total of 140 person-years. Four of these person-years come from first year energy savings. The remaining 128 total job-years are due to energy savings after the first year—and the reinvestment generated by the bill savings.

Table 5-8: Job Impacts from First Year Shocks

Job Impact Type	Total Jobs *(in person-years)*		
	From First Year Activities	From Bill Savings After First Year	Total
Direct	6	69	75
Indirect	2	27	29
Induced	3	33	36
Total[1]	**12**	**128**	**140**

Table 5-9 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 Administrative and support, waste management and remediation services, which added 40 jobs. This category is large and non-specific, and reflects the need to hire individuals to fill a large range of roles based on program need (e.g. office administration, call centre operations, program management, etc.). Non-residential business construction and Retail trade were the industries with the next most added jobs, gaining 17 and 13 jobs respectively.

Table 5-9: Job Impacts by Industry

Output Industry Category	FTE (in person-years)		Total Jobs (in person-years)	
	Ontario	Total	Ontario	Total
Administrative and support, waste management and remediation services	33	34	39	40
Non-residential building construction	14	14	17	17
Retail trade	9	10	12	13
Professional, scientific and technical services	8	9	10	12
Manufacturing	7	10	8	11
Wholesale trade	8	10	8	10
Finance, insurance, real estate, rental and leasing and holding companies	5	6	6	7
Accommodation and food services	2	3	3	4
Transportation and warehousing	3	4	3	4
Government education services	3	3	3	3
Other services (except public administration)	2	2	2	3
Information and cultural industries	2	2	2	2
Residential building construction	1	1	2	2
Health care and social assistance	1	1	1	2
Engineering construction	1	1	2	2
Repair construction	1	1	1	1
Arts, entertainment and recreation	0	1	1	1
Other federal government services	1	1	1	1
Educational services	0	0	1	1
Crop and animal production	0	0	0	1
Other municipal government services	1	1	1	1
Non-profit institutions serving households	0	1	1	1
Total[1]	**104**	**116**	**125**	**140**

[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 Small Business Lighting Assessors and Installer survey responses support the results of the model showing positive job impacts. The survey instrument contained questions for contractors and applicant representatives related to the impact of the SBL program on their firms and employment levels. Two questions in particular were informative to understand the nature of the impacts to respondents, which would be considered direct impacts. These two questions are below, with relevant illustrative verbatim responses below:

1) Did the 2020 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:

   - *"The program offered steady work during slow times."*
   - *"I hired staff to perform the work. I bought a vehicle also, to be able to carry out the work."*

- *"By adding another avenue to interact with potential new customers."*
- *"I have met a number of different types of people and businesses, the word-of-mouth allowed me to reach out to even more people since it is so user-friendly, quick and easy to set up."*

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

- "*It is hard to see that the program helped my business. I've invested money into another work vehicle and trailer to accommodate the supposed workload."*

2) Did the 2020 program have an impact on the number of people you hired in the last year? Yes, the program impacted the number of people hired in the last year in the following ways:

- *"I hired on additional staff to facilitate the work orders being done."*
- *"We had a regular crew dedicated to SBL."*

Respondents indicated that the program generally resulted in slight increases in staffing overall. Participants additionally stated that the program afforded steady revenue streams during times that business would otherwise be slower. No respondents indicated decreases in staffing due to the SBL program. Customer verbatims further support the direct job gains estimated by the model, with customers indicating that additional staff members had been hired as a result of the SBL program. This reveals the potential for beneficial impacts the program can have on firms. Respondents that indicated a negative effect on their business primarily stated that the biggest driver was slower than anticipated revenue streams, which did not justify the investments made to participate in the program. This issue could be examined further if parts of the program were to be redesigned in order to enhance job impacts.

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 thus has limitations. The model is based on the assumption of fixed technological coefficients. It does not take into account 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.

Appendix A Impact Evaluation Methodology

A.1 Sample Plan

Independently verifying the energy and demand savings and attributing these savings first requires selecting sample projects that represent the program's population. The goal of a representative sample ensures results can be applied to the population's 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 program database extract
- Overall confidence/precision targets of 90/10 for the program assuming a coefficient of variation (C_V) of 0.5

A.2 Project Counts

Due to the similarity of measures installed through the Small Business Lighting program applied a single sample based on completed projects

A.3 Project Audits

Subsequent to the sampling process, project audits representing the SBL population were completed. Sampled projects received Level 1 audits, which consist of desk reviews of project documentation available from the program delivery vendor. These documents include project applications, equipment specification sheets, notes on equipment installed, invoices for equipment, and any other documentation submitted to the program. Evaluation of the REP often includes Level 2 audits with on-site visits and extensive metering to estimate equipment hours of use and operational load. However, the PY20 evaluation cycle was disrupted by the COVID-19 pandemic with corresponding facility closures and social distancing requirements, leading to the suspension of on-site visits.

To maximize participant responses, we expanded the types of outreach conducted for the impact evaluation. In addition to verification phone calls, the evaluation added an option to complete virtual site visits through a software solution.

Virtual site visits permitted the EM&V staff to view through the phone, tablet, or computer camera with the approval of the participant. The software acts like a virtual meeting that allows screen sharing and can be moved around a facility to verify equipment installation, quantities, and operating parameters. However, we faced difficulty as many participants were still working from home, which limits the opportunity to complete a virtual site visit, or were uncomfortable sharing access through their mobile equipment.

A.4 Reported Savings

Gross reported savings are the energy and summer peak demand savings derived from information submitted on participant applications. They 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.

A.5 Verified Savings

Energy and demand savings are verified for all sampled projects and rely on data collected and verified during the project audit. This information is evaluated utilizing analytical tools to determine the savings attributable to each project. For a specific stratum, the verified savings are compared to the reported savings to define the stratum realization rate. This realization rate is then applied to all projects' gross reported savings in a stratum's population to estimate the stratum verified savings. Equation A-1 shows the formula for calculating a stratum's realization rate.

Equation A-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 for each project in the sample

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.

A.6 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, this 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 the changes in the operation of heating, ventilation and air-conditioning (HVAC) equipment due to lower heat loss from energy-efficient lighting equipment.

A.7 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, and other benefits continue to accrue each year the equipment is in service. The method of calculating lifetime energy savings of a measure level is presented in Equation A-2.

Equation A-2: Lifetime Energy Savings

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

Where:

EUL = Estimated useful life of the retrofitted equipment

Appendix B Detailed Net-to-Gross Methodology

This appendix provides detail on the sampling plans for collecting NTG data, the instruments used to assess FR and SO, the implementation of the data collection, and the analysis methods.

An effective questionnaire was developed to assess FR and SO. The approach has been used successfully in many previous evaluations. The NTG ratio presented in Equation B-3 is defined as follows:

Equation B-3: Net-to-gross Ratio

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

Where FR is free-ridership and SO is spillover.

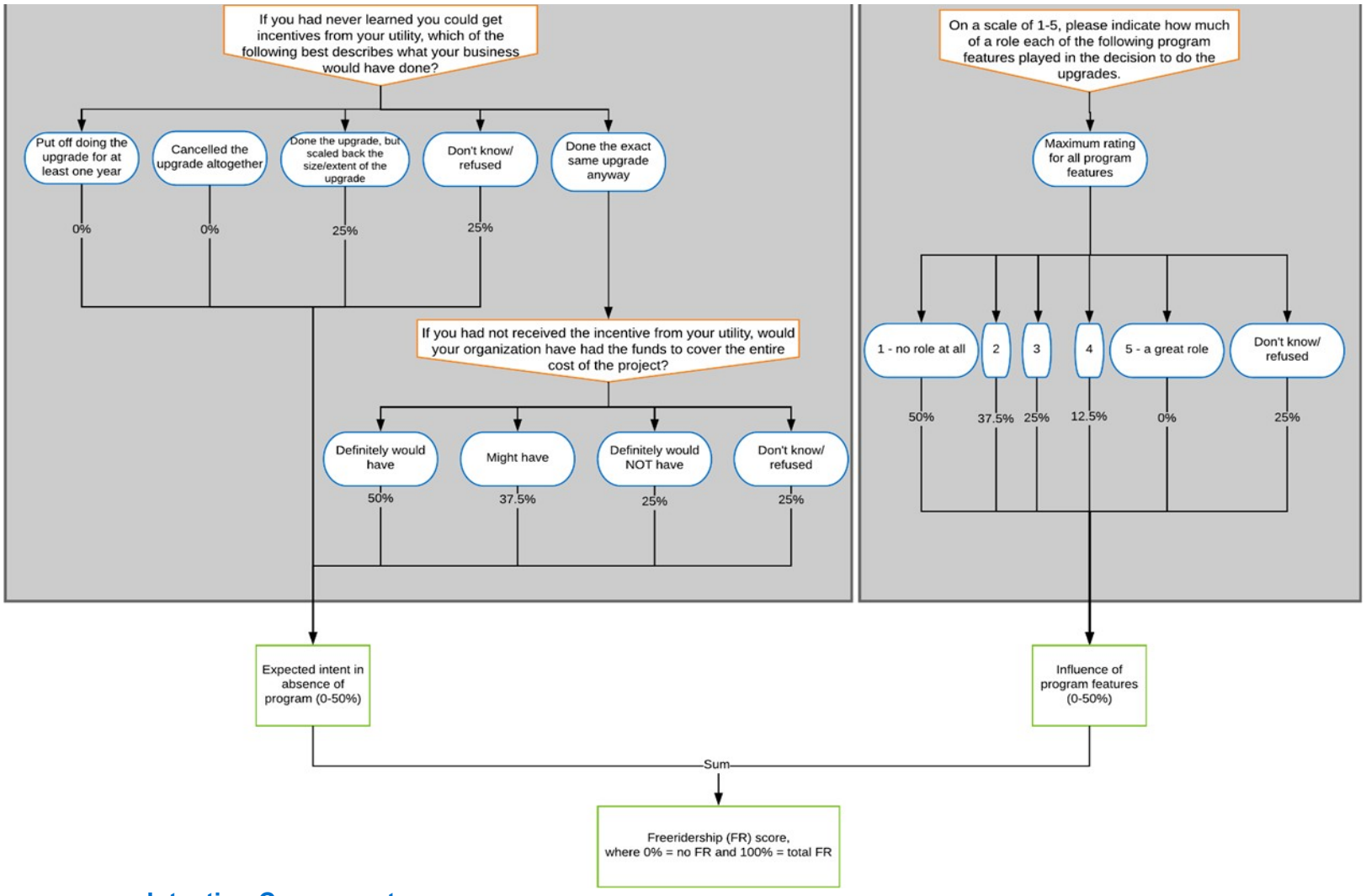
B.1 Free-ridership Methodology

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 program's absence
- 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 B-1 illustrates the FR methodology.

Figure B-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 B-10 indicates the possible intention scores a respondent could have received depending on their responses to these two questions.

Table B-10: 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)

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) 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).

The bullet points below display the same FR intention scoring approach in list form. As mentioned above, for each respondent, the evaluation team calculated an intention score, 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%
- 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 firm would have made funds available = 37.5%
- No change and respondent confirms firm would have made funds available = 50%

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 B-11 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 B-11: 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.

B.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:

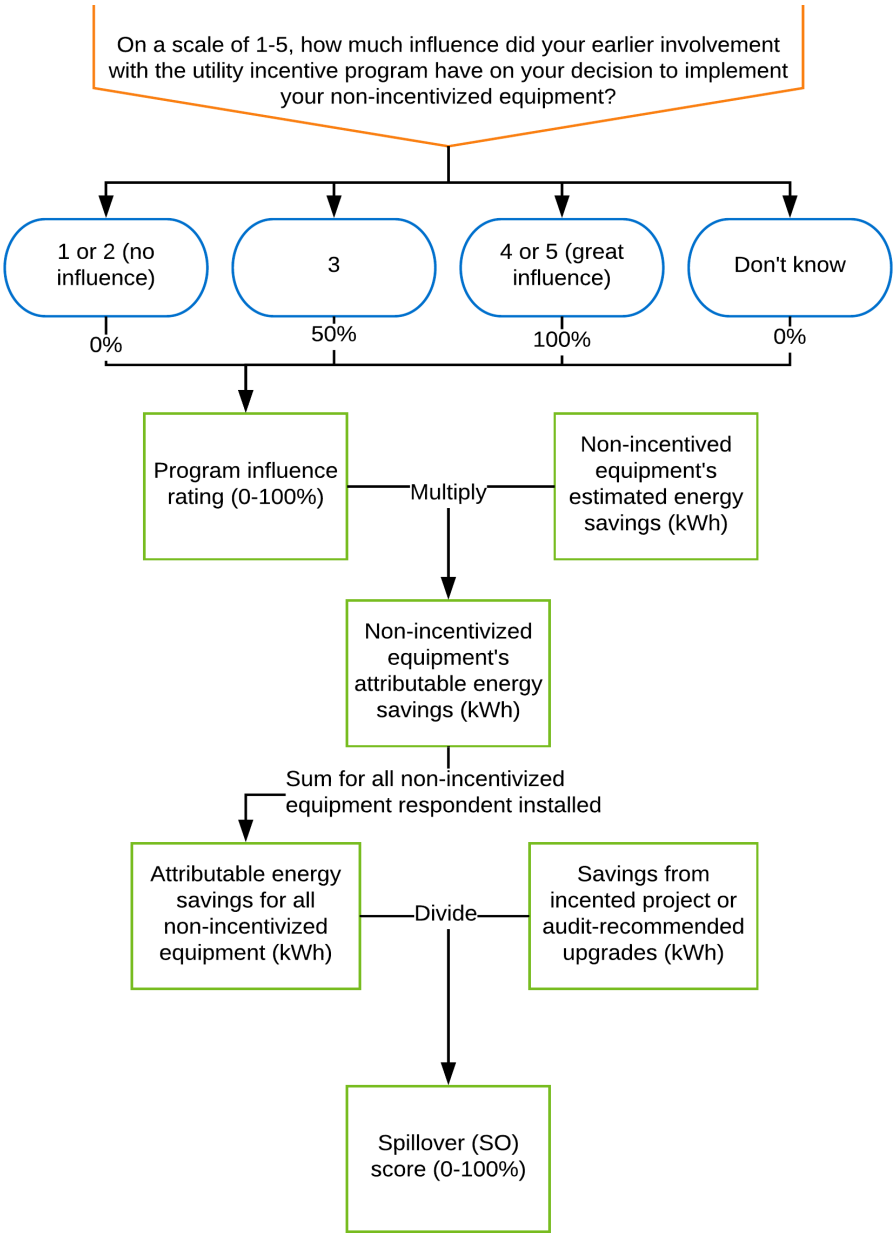
- Maximum rating of 1 or 2 (no influence) = 0%
- Maximum rating of 3 = 50%
- Maximum rating of 4 or 5 (great influence) = 100%
- Respondent does not know how much influence any factor had = 0%

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 B-2 illustrates the SO methodology.

Figure B-2: Spillover Methodology



B.3 Identification of Project or Upgrade for NTG Assessment

Participants were asked to consider all their completed projects in 2020 through the particular program in question. This approach allowed for the respondent's NTG value across all the projects they completed in 2020 to be applied rather than just one.

B.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 in the algorithms for calculating FR or SO but 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.

B.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 web link to the appropriate contact to fill it out if they were not the appropriate contact to do so.

Appendix C Detailed Process Evaluation Methodology

This appendix provides additional detail about the process evaluation methodology. A summary of the methodology was provided in Section 4.1. The process evaluation collected primary data from key program actors, including the IESO program staff, program delivery vendor staff, assessors, installers, and participants (Table C-12). Data were 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 C-12: 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 ID	1	1	0%
SBL Assessors and Installers	Web Survey	54	17	17.0%
SBL Participants	Web and Phone Survey	994	182[1]	5.5%

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

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

One in-depth interviews (IDI) was completed with one member of the IESO program staff and a second IDI was completed with two members of the program delivery vendor staff. (Table C-13). The purpose of the interviews was to better understand the perspectives of the IESO program staff and program delivery vendor staff 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

[1] The count of respondents associated with the process evaluation results (n=182) is one more than the count of respondents associated with the NTG evaluation results (n=181) due to the NTG results being finalized prior to the submission of one final response to the participant survey.

staff using in-house staff (rather than through a survey lab). The interviews were completed between May 4 and May 10 of 2021. Each interview took approximately one hour to complete.

Table C-13: IESO Program Staff and Program Delivery Vendor Staff IDI Disposition

Disposition Report	IESO Program Staff	Program Delivery Vendor Staff	Total
Completes	1	1	2
No Response	0	0	0
Unsubscribed	0	0	0
Partial Complete	0	0	0
Bad Contact Info (No Replacement Found)	0	0	0
Total Invited to Participate	1	1	2

C.2 SBL Assessor and Installer Survey

A total of 17 SBL assessors and installers were surveyed from a sample of 54 unique companies (Table C-14). 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, barriers and suggestions for improvement, satisfaction, job impacts, and impacts of the COVID-19 crisis.

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 March 16 and April 12 of 2021. The survey took an average of 15 minutes to complete after removing outliers.[2] Weekly email reminders were sent to non-responsive contacts throughout web survey fielding.

Table C-14: Assessor and Installer Survey Disposition

Disposition Report	Count
Completes	17
Emails bounced	2
Bad Contact Info (No Replacement Found)	1
Unsubscribed	--
Partial Complete	21
Screened Out	--
No Response	13
Total Invited to Participate	54

[2] 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.

C.3 SBL Participant Survey

A total of 182 SBL participants were surveyed from a sample of 994 unique contacts (Table C-15). 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, and the overall installation process; FR and SO, additional lighting upgrades, control equipment, participation in other programs, job impacts, 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 was selected for inclusion in the survey sample that did not overlap with the impact evaluation sampling.

The survey was delivered over the phone and the web in partnership with the Nexant survey lab using Qualtrics survey software. Survey implementation was conducted between March 22 and April 26 of 2021. The survey took an average of 15 minutes to complete after removing outliers.[3] Weekly e-mail reminders were sent to non-responsive contacts throughout web survey fielding.

Table C-15: SBL Participant Survey Disposition

Disposition Report	Count
Completes	182
Emails bounced	51
Bad Contact Info (No Replacement Found)	--
Unsubscribed	--
Partial Complete	59
Screened Out	16
No Response	687
Total Invited to Participate	995

[3] 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.

Appendix D Additional NTG and Process Evaluation Results

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

D.1 Additional Net-to-Gross Results

Figure D-3: Influence of Program Features on Participation (n=181)

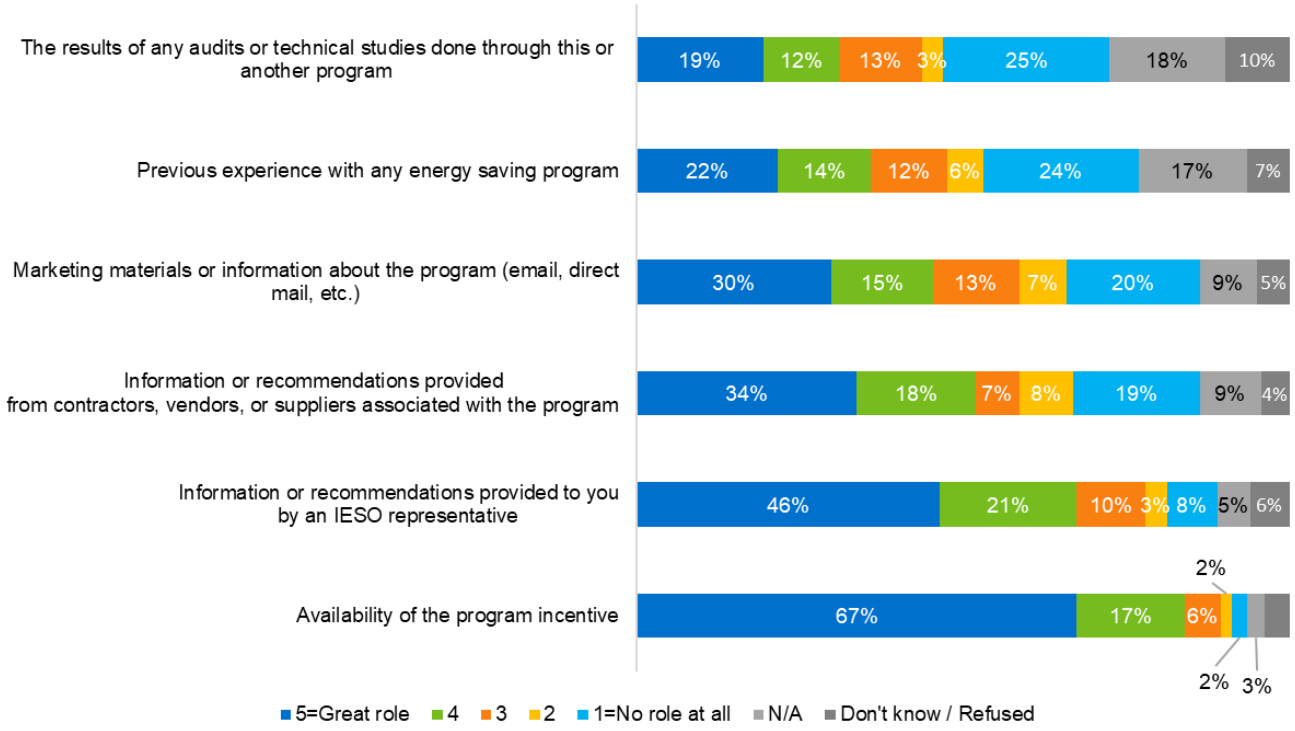


Figure D-4: Measures Installed Due to Spillover and Program Influence

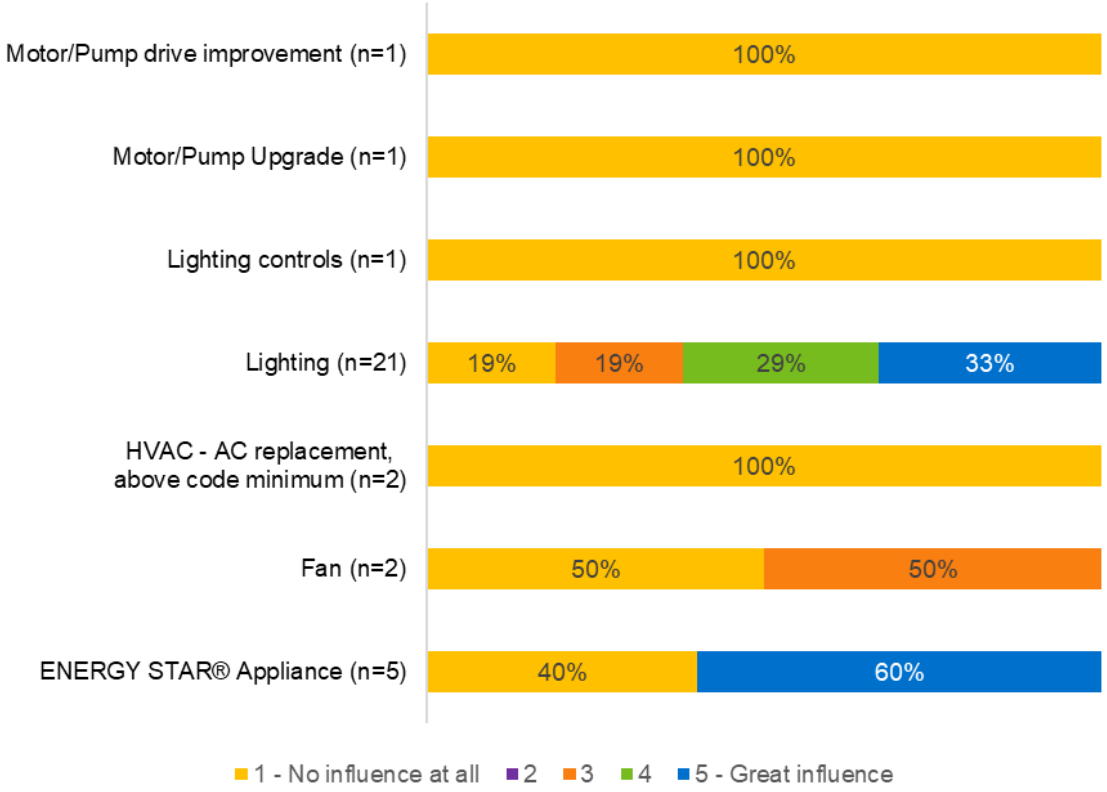


Table D-16: Spillover Measures – ENERGY STAR Appliances

ENERGY STAR Appliance	Number of Respondents	Number of Appliances
Dishwasher	2	2
Clothes Washer	2	3
Refrigerator	2	3

Table D-17: 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	48				
LED exterior	5	17			Pole mount (1); Against building (4)	
LED linear	9		347			
LED screw base	2	9		<10		
Linear Fluorescent	3	8	33	T5		<20 ft. (2), 20+ ft. (1)

Table D-18: Spillover Measures – Fans and Air Conditioners

Equipment Type	Number of Respondents	Number Installed	Size
Fan	1	2	<1-foot diameter

D.2 Additional Process Evaluation Results

Figure D-5: Assessor and Installer Satisfaction (n=17)

(Scale from 1 to 5)

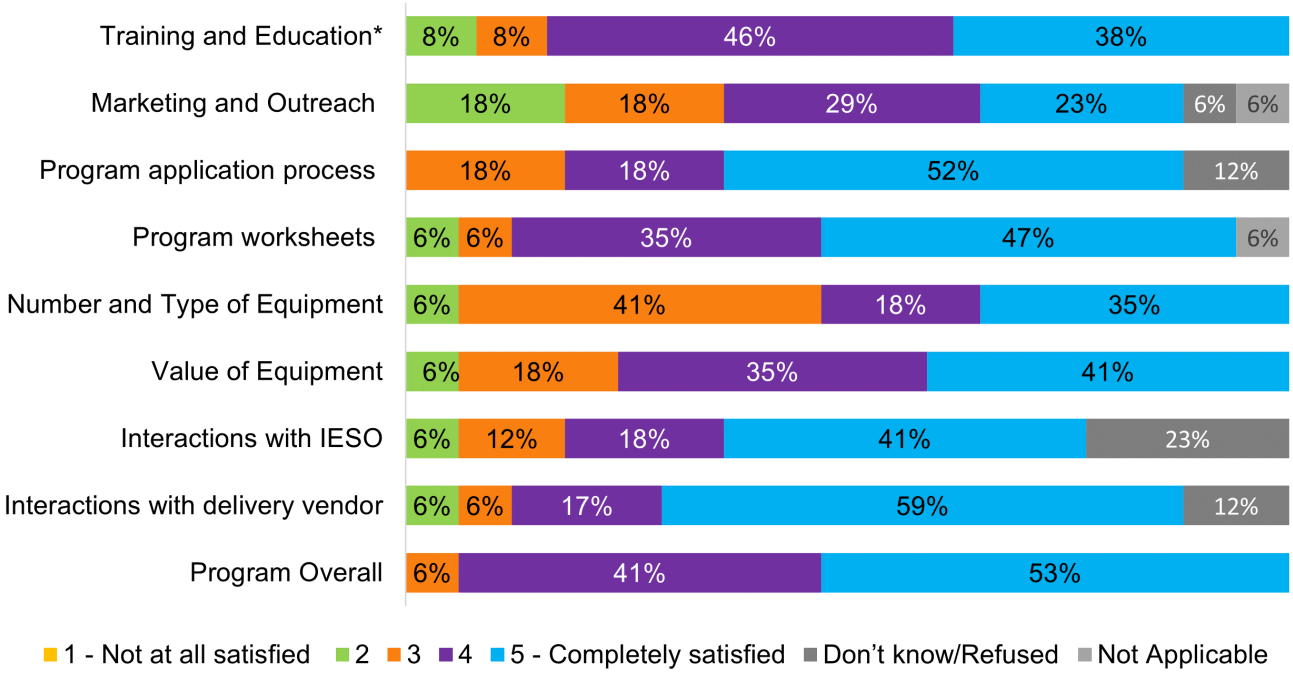


Table D-19: Assessor and Installer Suggestions for Additional Lighting Offerings (n=12)

Suggested Lighting Offerings	Number of Respondent Suggestions
Outdoor Wallpacks/Floodlights	4
8' T8 Lamps	3
Outdoor Signs	2
Outdoor Poles	2
8' T12 Lamps	1
U Shape Lamps	1
Advanced Lighting Controls	1

Appendix E SBL Building Types and Delivery Regions

Table E-20: 2020 SBL Program Reported Building Types

Building Type Reported in SBL Database	Nexant Designation
Cattle Farm	Agricultural
Agricultural Other	Agricultural
Swine Farm	Agricultural
Dairy Farm	Agricultural
Greenhouse	Agricultural
Convienience Stores	Convienience Stores
Convenience Stores	Convienience Stores
Hotels: Corridors	Hotels/Motels
Hotels/Motels: Public Spaces	Hotels/Motels
Hotels/Motels: Guest Rooms	Hotels/Motels
Office (small suite)	Office
Low Rise Office Bldgs - Core	Office
Industrial Plants: Offices	Office
Schools	Others
Nursing Homes	Others
Laboratories	Others
Computer Rooms	Others
Clubhouses	Others-Entertainment
Museums	Others-Entertainment
Beauty Parlors	Others-Service
Medical Centres & Clinic	Others-Service
Barber Shops	Others-Service
Dental Offices	Others-Service
Fire Stations	Others-Service
Funeral homes	Others-Service
Places of Worship	Others-Service
Municipal Bldgs - Town Halls	Others-Service
Places of Worship	Others-Service
Police Stations	Others-Service
Libraries	Others-Service
Banks	Others-Service
Full Service Restaurants	Restaurants
Fast Food Restaurant	Restaurants
Bars & Taverns	Restaurants
Small Retail Stores	Retail
Retailer Stores	Retail
Grocery Stores	Retail

Building Type Reported in SBL Database	Nexant Designation
Supermarkets	Retail
Department Stores	Retail
Retail Stores in Malls	Retail
Warehouses	Warehouses

Table E-21: 2020 SBL Geographic Regions

Postal Code First Character	Nexant Geographic Region	Project Count
Central	L	673
Eastern	K	429
Southwestern	N	429
Northern	P	381
Toronto	M	257

Appendix F Job Impacts Methodology

F.1 Developed Specific Research Questions

The first step in modeling the job impacts from the SBL program was to determine which specific research questions (RQs) the model would answer. In a scenario without the existence of the SBL program, 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 sectors of the economy. The four research questions below illustrate these shocks:

3) **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 equipment and appliances. 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 implementers collect funds from the IESO to cover a portion of the project cost, while the participant covers the remainder of the costs.
4) **What are the job impacts from business reinvestments?** Once energy-efficient equipment is installed, the customers realize annual energy savings for the useful life of the measures. 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 sectors of the economy.
5) **What are the job impacts from funding the EE program?** 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.
6) **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.

F.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:

7) **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 (see Section 5). 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. For the product categories, we used a representative sample of invoices 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).

8) **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 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 results from the impact evaluation, and already accounted for other calculation parameters (i.e. discount rate, measure EULs, and retail rate forecast).

Customers' intentions for whether to reinvest, save, or distribute to owners/shareholders the money saved on energy bills was obtained via a short section on the participant surveys, as follows:

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.

9) **SBL funding:** IESO EE programs are funded by a volumetric charge on electricity bills and, volumetrically, residential customers accounted for 35 percent of 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.

10) **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.

F.3 Run Model and Interpret Results

Determining the total job impacts from the SBL program 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:

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

12) 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.

13) Household Expenditure shock representing the portion of household funds that are 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 that is 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 first adding employees to install measures and handle administrative duties. For the business reinvestment shock, direct impacts could be internal jobs created by businesses reinvesting savings back into the company, or they could 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 new demands of the directly affected industries. These include jobs created up supply chains due to the demand created by the EE program – such as the manufacturing of 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 that are 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 5.

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