Interim Framework Kanata North Retrofit Top-Up Local Program PY2022 Evaluation Results

Submitted to IESO

in partnership with NMR Group

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Principal authors:

Resource Innovations – Bashar Alhayek, Dylan Klomhaus

NMR Group – Joanne O'Donnell, Christine Smaglia, Michelle Zelenka

Resource Innovations

TD Canada Trust Tower

161 Bay Street, 27th Floor

M5J 2S1 Toronto, Canada

416.572.2433

resource-innovations.com

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Acronyms and Abbreviations

BAS	Building Automation System
CDM	Conservation and Demand Management
CDM-IS	Content data management information system
DCKV	Demand control kitchen ventilation
EM&V	Evaluation, measurement, and verification
EUL	Effective useful life
FR	Free-ridership
GW or GWh	Measurement of demand (GW) or energy (GWh) equivalent to 1,000,000,000 W or Whr
HVAC	Heating, ventilation, and air conditioning
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
RR	Realization Rate
SO	Spillover
VFD	Variable frequency drive

1. Executive Summary

Resource Innovations, Inc., (formerly Nexant, Inc.) and its partner, NMR Group, Inc., (noted throughout this report as 'the evaluation team'), were retained by the Independent Electric System Operator (IESO) for the evaluation of the 2020-2022 program years of the Interim Framework (IF) Kanata North Retrofit Top-Up Program (Kanata North Retrofit Program). This report presents the results of the impact and process evaluations, and a cost-effectiveness assessment.

1.1. Program Description

The Kanata North Retrofit Program is Hydro Ottawa's Local program, specifically targeting the Kanata North area of Ottawa. The program offered top-up incentives (standard retrofit program incentive tripled, offering up to $2,400/kW for non-lighting measures and $1,200/kW for lighting measures) for certain measures currently included in the provincial Retrofit program. Eligible measures produce summer peak demand savings greater than zero and include custom measures and prescriptive energy-efficient measures available under the provincial Retrofit Program's Prescriptive Worksheets.

In addition to the increased incentives, the program employed a targeted outreach strategy that embedded three full-time resources—one Energy Manager (EM), one Program Officer (PO), and a Sales Support Agent—to drive participation within the local program by identifying opportunities, developing business plans, submitting incentive applications, and supporting implementation of conservation measures. The EM primarily targeted large commercial buildings, manufacturing facilities, and data centers. The PO primarily targeted schools, hotels, food stores, box stores, and other small businesses in the area. The sales support agent primarily acted as the applicant representative for all submissions into the application platform.

This combined strategy created a compelling value proposition to motivate customers to implement conservation measures, participate in other IESO energy-efficiency programs, and drive more energy and summer peak demand savings in this critically grid-constrained area.

1.2. Evaluation Objectives

The IESO outlined the following objectives for the Kanata North Retrofit Program evaluation:

- Conduct audits of completed projects to evaluate, measure, and verify completion and operating parameters through desk reviews, site visits, and on-site inspections and metering.
- Verify gross energy and summer peak demand savings on a program level at a 90% level of confidence at 10% precision. Assess free-ridership and participant spillover to determine an appropriate net-to-gross (NTG) ratio.
- Perform a cost-effectiveness assessment and a greenhouse gas reduction estimate for the local program.

- Conduct a process evaluation by addressing research questions identified in coordination with the IESO.
- Deliver annual reports, memos, and impact results templates along with a final report that meet the IESO's requirements and deadlines.
- Provide thoughtful recommendations on program improvements based on feedback obtained through the evaluations.

1.3. Summary of Results

1.3.1. Impact Evaluation

This section summarizes savings and cost-effectiveness results verified through the impact evaluation. This evaluation analyzed the program's impact and quantified savings realized through implementing energy-efficiency Retrofit projects in the Kanata North Retrofit Program from PY2020 to PY2022.

Table 1-1 shows the Kanata North Retrofit Program's overall impact results. First-year net verified energy and summer peak demand savings were 5,689 MWh and 1,110 kW, respectively. For applicable lighting measures, gross verified savings include interactive effects.

Table 1-1: Energy and Summer Peak Demand Impacts

Savings Type	Gross Reported Savings	Gross Verified Savings	Net Verified Savings
First-year Energy (MWh)	9,875	9,279	5,689
First-year Summer Peak Demand (kW)	1,820	1,811	1,110

Table 1-2 presents energy and summer peak demand sample realization rates for the Kanata North Retrofit Program. The program achieved a 93.96% energy realization rate and a 99.47% summer peak demand realization rate. The evaluation sample achieved the targeted 10% precision at the 90% confidence level for energy and summer peak demand realization rates.

Table 1-2: Kanata North Retrofit Program Sample Realization Rates

Savings Type	Realization Rate	RR Relative Precision
Energy	93.96%	9.8%
Demand	99.47%	7.1%

Figure 1-1 and Figure 1-2 display net verified first-year energy and summer peak demand savings percentages for the Kanata North Retrofit Program, broken into lighting and non-lighting measures.

Non-lighting measures represented 64% of total net verified first-year energy savings achieved by the program, while lighting measures accounted for 36%. A similar trend appeared for summer peak demand savings, with non-lighting measures accounting for 62% of total program demand savings and lighting measures contributing the remaining 38%

Figure 1-1: First-Year Net Verified Energy Savings % by Track

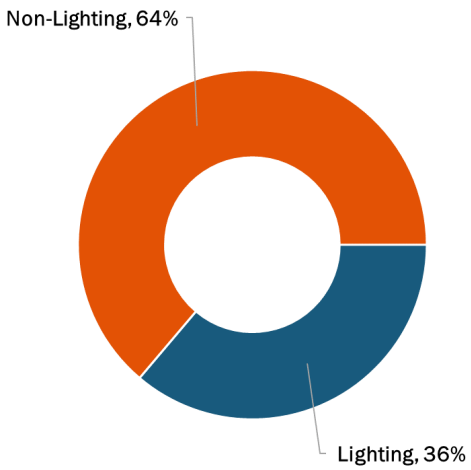


Figure 1-2: First-Year Net Verified Summer Peak Demand Savings % by Track & Type

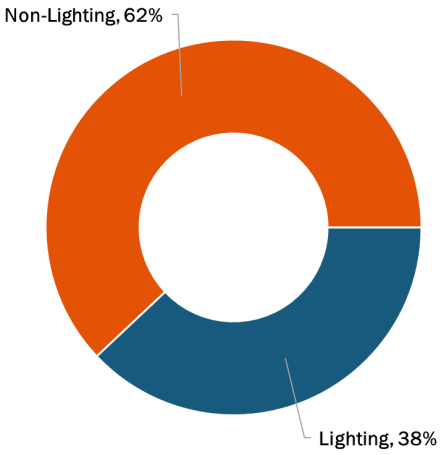
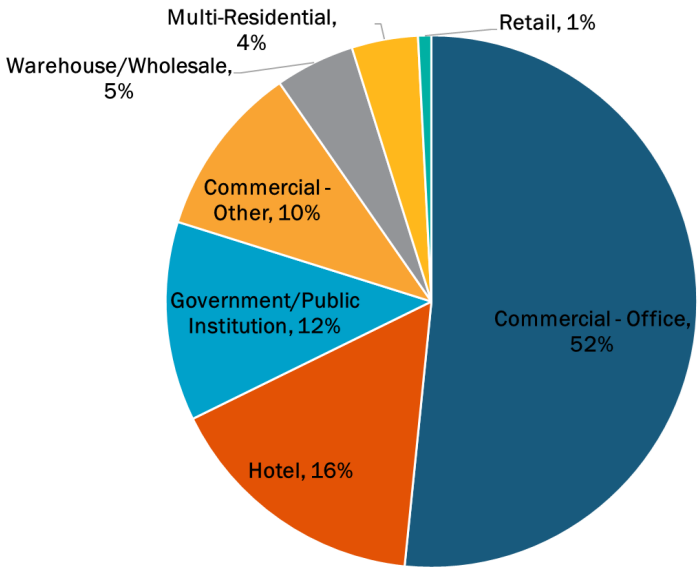


Figure 1-3 displays the measure count percentage of each facility type within the population. The Commercial—Office facility type represented 52% of total program measures. Alternatively, retail facilities accounted for only 1% of the projects.

Figure 1-3: Measure Count Percentage by Facility Type



1.3.2. Process Evaluation

The evaluation team performed a process evaluation to better understand the design and delivery for the Kanata North Retrofit Program. The team collected primary data to support this evaluation through interviews with local distribution company (LDC) staff and survey participants. This executive summary summarizes key insights drawn from the process evaluation, while section 7 presents these insights in greater detail.

Higher incentive amounts. The majority of participants reported that they would not have been likely to complete their project at the same scope (seven respondents), timeline (nine respondents), and energy-efficiency level (eight respondents) had the incentive been reduced by two-thirds. Most participants (seven out of ten) indicated that the higher incentive reduced the time required for their company to complete the project-approval process, and LDC staff reported that the higher incentive amount resulted in higher participation levels, noting that some projects probably would never have occurred without the increased amount.

Strong relationships and enhanced customer support. Pre-existing relationships that Hydro Ottawa Limited (HOL) built with many eligible customers and their trade allies over the years helped drive the program's success. This trust level, combined with the enhanced customer support level offered by the program (e.g., the "white glove" service level offered by the EM, PO, and sales support agent) proved instrumental in pushing some very large projects towards approval.

Marketing and outreach. The program's marketing and outreach strategy, which focused heavily on one-on-one interactions with customers, proved to be a program strength. The program employed two full-time staff responsible for reaching out to customers through a one-on-one approach, either by phone or through in-person interactions.

Equipment offerings. Most participants (nine out of twelve) could install all energy-efficient models or equipment types of interest to them. Participants most commonly recommended adding additional lighting and solar photovoltaic (PV) (each mentioned by two participants) to the program's measure mix.

1.4. Key Findings and Recommendations

This section includes a subset of the most important evaluation key findings and recommendations. Section 8 presents all the key findings and recommendations.

Finding 1: The increased incentive, coupled with the enhanced customer support level, allowed most participants to complete their projects of a scope, size, and timeline that they would have otherwise been unlikely to reach. LDC staff reported that one of the program's key strengths was its unique design and delivery approach. This approach included an incentive amount triple (up to $2,400/kW for non-lighting measures and up to $1,200/kW for lighting measures) that of the provincial Retrofit Program. The enhanced customer support level, provided by the EM, PO, and Sales Support Agent also contributed to the program's unique design and delivery approach. LDC staff also reported that the higher incentive amounts resulted in higher participation levels, noting that some projects would likely not have occurred without the higher incentives. Participants reported that, had the incentive been reduced by one-third, one-half, or two-thirds, they would have been increasingly less likely to have completed their projects on the same scope, timeline, or energy-efficiency level. Most participants indicated that the higher incentive reduced the time that their company required to complete the project approval process. LDC staff reported that, were they to offer the program again, they would consider reducing the incentive amount to twice rather than triple the provincial Retrofit Program incentive (up to $1,600/kW as compared to $2,400/kW for non-lighting measures and up to $800/kW as compared to $1,200/kW for lighting measures).

- **Recommendation 1a:** If offering similar future programs, there may be room to reduce the incentive amount of up to $2,400/kW for non-lighting measures and up to $1,200/kW for lighting measures (triple the provincial Retrofit Program incentive) to an incentive amount of up to $1,600/kW for non-lighting measures and up to $800/kW for lighting measures (double the provincial Retrofit Program incentive) while still maintaining or increasing participation levels.
- **Recommendation 1b:** If offering similar future programs, continue the same enhanced customer support levels as those provided by the EM, PO, and Sales Support Agent.

Finding 2: The program largely succeeded and quickly became fully subscribed with larger projects. LDC staff said, despite project and supply chain delays caused by the COVID-19 pandemic, the program quickly became fully subscribed through its original budget due to application submissions associated with larger projects. LDC staff reported that they successfully worked with the IESO to increase the program budget through a contractual amendment, and they subscribed to the majority of that additional budget prior to the Interim Framework's submission deadline. Staff reported that, if they offered the program again, they would consider extending it for a longer duration.

- **Recommendation 2a:** If offering similar programs, consider requesting a larger budget from the outset to avoid the necessity of a contractual amendment.
- **Recommendation 2b:** If offering similar programs, consider extending the program for a longer duration.

Finding 3: Relationships that HOL developed with customers and trade allies over the years contributed to the program's success. LDC staff stressed how HOL's pre-existing relationships built with many eligible customers and their trade allies served as a factor that helped drive the program's success. They explained that this trust level, in addition to the enhanced customer support (which was of the technical variety, especially for the larger and complex projects), and increased incentive levels (see **Recommendation 1a and 1b**), served as a major factor in pushing some very large projects towards approval.

- **Recommendation 3:** Continue developing existing relationships and looking for opportunities to create new relationships with customers and trade allies.

Finding 4: One-on-one marketing and outreach approaches effectively drove program participation. LDC staff reported that the program's strategy for marketing and outreach, which heavily focused on one-on-one interactions with customers, provided another program strength. Early activities included an e-mail campaign as well as a webinar inviting eligible customers' participation. Additionally, the program dedicated two full-time staff to program marketing and outreach activities. These staff reached out to customers using a one-on-one approach, either by phone or through in-person interactions (e.g., cold-calling customers, knocking on doors of small businesses, informing larger customers that they engaged on a more frequent basis as part of their typical business practices). One participant mentioned improving/increasing marketing to strengthen the program.

- **Recommendation 4a.** If offering similar programs, ensure that marketing and outreach strategies continue to rely heavily on one-on-one interactions to engage customers. The dedicated support provided by Energy Managers is an important part of the customer engagement process, especially for larger and more complex projects.
- **Recommendation 4b.** If offering similar programs that target higher participation, consider increasing the marketing and outreach level, depending on customer interest generated and overall budget availability. The Kanata North program quickly became fully subscribed, making prolonged outreach unnecessary, however, future programs may benefit from additional or more diverse marketing efforts.

Finding 5: The higher incentives that tripled the standard retrofit program incentives drove higher summer peak demand savings per project. The average Kanata North Retrofit program project delivered 19.1 kW in net verified, first-year summer peak demand savings, for a 59% increase in net verified, first-year summer peak demand savings compared to the PY2022 IF Retrofit program zone 4 results. Section 4.5.1 presents this finding with additional detail.

- **Recommendation 5:** Consider offering higher measure incentives for measures that target summer peak demand savings to drive more peak demand savings in targeted geographic areas or participant groups.

2. Introduction

This report summarizes the evaluation results for the PY2020 to PY2022 Kanata North Retrofit program; this includes projects completed and reported to the IESO between January 1, 2020, and December 31, 2022.

2.1. Program Description

The Kanata North Retrofit Program is Hydro Ottawa's local program, targeted specifically for the Kanata North area of Ottawa. The program offers top-up incentives (the standard retrofit program incentive tripled, offering up to $2400/kW for non-lighting measures and $1200/kW for lighting measures) for certain measures currently included in the Retrofit program. Eligible measures include those which produce summer peak demand savings greater than zero and include custom measures and prescriptive energy-efficient measures available under the provincial Retrofit Program's Prescriptive Worksheets. The Kanata North Retrofit Program is available only for commercial, industrial, institutional, and multi-residential buildings located in Kanata North.

In addition to the increased incentives, the program employs a targeted outreach strategy that embeds three full-time resources—one energy manager (EM), one program officer (PO), and a sales support agent—to drive participation within the local program by identifying opportunities, developing business plans, submitting incentive applications, and supporting implementation of conservation measures. The EM provides an enhanced level of technical support to the large commercial buildings, manufacturing facilities, and data centers it targets. The PO primarily targets schools, hotels, food stores, box stores, and other small businesses in the area. The sales support agent primarily serves as an applicant's representative for all application platform submissions.

This combined strategy creates a compelling value proposition for motivating customers to implement conservation measures, participate in other IESO energy-efficiency programs, and drive greater energy and summer peak demand savings in this critically grid-constrained area.

2.2. Evaluation Objectives

The Kanata North Retrofit Local Program evaluation sought to achieve the following objectives:

- Conduct audits of completed projects to evaluate, measure, and verify completion and operating parameters through desk reviews, site visits, and on-site inspections and metering.
- Verify gross energy and summer peak demand savings on a program level at a 90% level of confidence at 10% precision. Assess free-ridership and participant spillover to determine an appropriate net-to-gross (NTG) ratio.
- Perform a cost-effectiveness assessment, and greenhouse gas (GHG) reduction estimate for the local program.

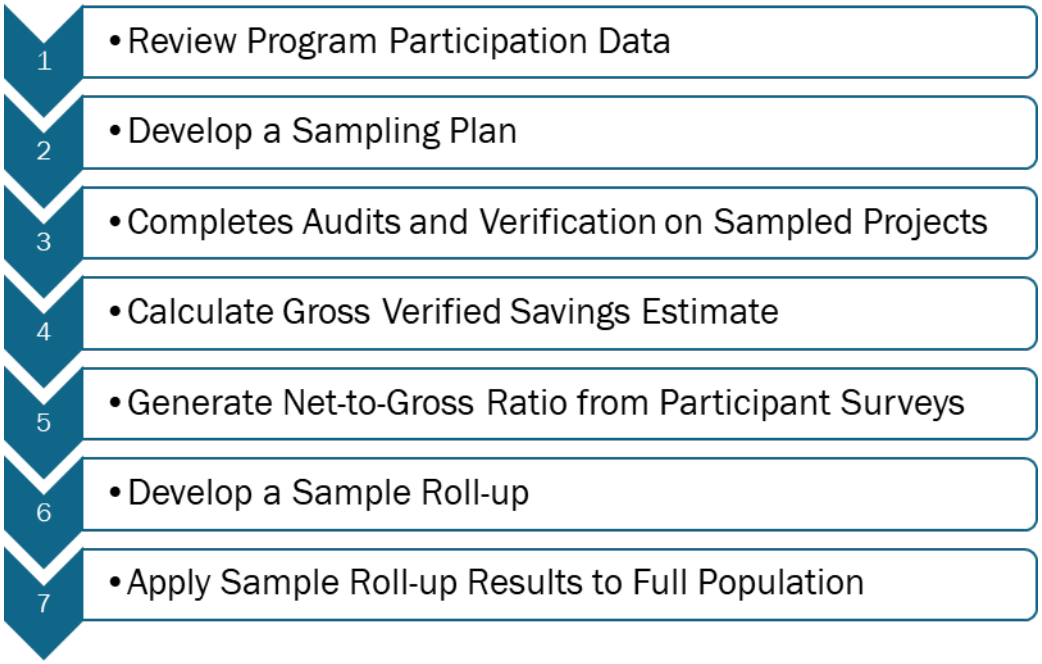
- Conduct a process evaluation by addressing research questions identified in concert with the IESO.
- Deliver annual reports, memos, and impact result templates along with a final report that meets the IESO's requirements and deadlines.
- Provide thoughtful recommendations regarding program improvements based on feedback obtained through the evaluations.

3. Methodology

3.1. Impact Evaluation Methodology

Figure 3-1 presents the impact evaluation methodology, comprised of distinct components.

Figure 3-1: Impact Evaluation Methodology



3.1.1. Project Participation and Sampling

The evaluation team drew the impact evaluation sample from Kanata North Retrofit Program projects completed and paid for between January 1, 2020, and December 31, 2022. The Kanata North Retrofit Program is a local program, available only to commercial buildings located in Kanata North. Specifically limiting program participants to this geographic location and property type results in relatively small program participation numbers compared to the provincial retrofit program. The Kanata North Retrofit program includes 58 total evaluation projects. The evaluation team ensured that the sample reflected the actual program population and savings contribution by track and technology type to the greatest extent possible, given the limited population of the measure and technology tracks.

The Kanata North Retrofit population sampling across PYs 2020-2022 considered the evaluation's goals and objectives as defined by the local distribution company (LDC), the IESO, the program population size, the relative distribution of reported energy savings in each track, and the expected amount of measure performance variation between projects. Selected project samples targeted results with a 90% level of confidence at a 10% precision level across the entire program population.

Considering the targeted confidence and precision levels and assuming a coefficient of variation (Cv) of 0.5, the PYs 2020-2022 sampling plan for the Kanata North Retrofit program resulted in a 28-projected target sample, with at least five non-lighting project types, as shown in Table 3-1. Table 3-2 shows the program population and sample, broken into project tracks (prescriptive or custom) and types (lighting or non-lighting).

Table 3-1: Impact Evaluation Sample by Project Type

Project Type	Sample Project Count	Population Project Count
Lighting	23	40
Non-Lighting	5	18
TOTAL	28	58

Table 3-2: Impact Evaluation Sample by Project Track & Type

Track & Type	Sample Project Count	Population Project Count
Prescriptive Lighting	12	17
Prescriptive Non-lighting	0	4
Custom Lighting	11	23
Custom Non-lighting	5	14
Total	28	58

Each sampled project received a desk review and an independent project analysis using equipment-specific data, collected from participants, to verify gross savings. Of sampled projects, 61% (17 of 28) received additional on-site verification and data collection during the impact evaluation. Using these individual sample project results, the evaluation team calculated the realization rates applied to savings from projects in the evaluation population. Appendix A and Appendix B provide additional detail on the impact and NTG methodologies, respectively.

3.1.2. Net-to-Gross Evaluation Methodology

The evaluation team utilized participant self-report survey results to estimate the NTG ratio. The team used the same survey sample design for the NTG and process evaluations as the participant self-report survey included both evaluation areas. The sample was developed at the provincial level. The survey results achieved a NTG at 85% confidence and 15% precision.

The evaluation team calculated net energy and summer peak demand savings attributable to the program by multiplying gross verified energy and summer peak demand savings by the NTG. This equation and general methodology provided estimated net energy and summer peak demand savings. The NTG ratio is based on measurement of free-ridership (FR) and spillover (SO) rates, as defined in Equation 1.

Equation 1: NTG Ratio

$$NTG = 1 - Free\ Ridership + Spillover$$

FR and SO are represented as percentages of the program's total reported savings and estimated for each survey respondent. The results are aggregated to develop total FR and SO estimates and are weighted by the percentage of savings associated with each respondent's completed energy-efficiency project. Therefore, respondents with comparatively larger projects influence the total estimates more than smaller projects, allowing for results that are reflective of the responding participants and their associated impact on the program.

Appendix B provides additional detail on the NTG methodology.

3.2. Process Evaluation Methodology

The process evaluation focused on program design and delivery. Using surveys with program participants and an interview with LDC staff, the evaluation team assessed program processes. For each respondent type, the team developed a customized interview guide or survey instrument to ensure that responses produced comparable data and allowed for inference of meaningful conclusions. Table 3-3 presents the survey methodology, the total population invited to participate in the surveys or interviews, the total number of completed surveys, the response rate, and the sampling error at the 90% confidence level for each respondent type.

Table 3-3: Process Evaluation Primary Data Sources

Respondent Type	Methodology	Population	Completed	Response Rate	90% CI Error Margin
LDC Staff	Phone In-depth Interview (IDI)	1	1	100%	0.0%
Participants	Web and Phone Survey	27	12	44%	N/A*

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

Section 7 provides the context regarding each surveyed group, and Appendix C provides additional detail regarding the process evaluation methodology.

4. Impact Evaluation Results

The evaluation team performed an impact evaluation to assess energy and summer peak demand savings attributable to the program and to quantify savings generated by implementing projects in the Kanata North Retrofit Program during the evaluation period.

4.1. Energy and Demand Savings

Overall impact savings results for the PY2020 through PY2022 Kanata North Retrofit Program indicate that total first-year net verified energy and summer peak demand savings were 5,689 MWh and 1,110 kW, respectively. Table 4-1 presents energy impact results for each program year during the evaluation period; and Table 4-2 presents summer peak demand results. Gross verified savings included interactive effects for applicable lighting measures. Sections 4.6 and Appendix D provide details on the Net-to-Gross evaluation results.

Table 4-1: Energy Impact Results

Program Year	Reported Savings (MWh)	Gross Verified Savings (MWh)	Net-to-Gross	Net Verified Savings (MWh)	Net Verified Savings at 2022 (MWh)
2020	157	148	61.3%	91	91
2021	3,000	2,819	61.3%	1,728	1,728
2022	6,718	6,312	61.3%	3,870	3,870
Total	**9,875**	**9,279**	**61.3%**	**5,689**	**5,689**

Table 4-2: Summer Peak Demand Impact Results

Program Year	Reported Savings (kW)	Gross Verified Savings (kW)	Net-to-Gross	Net Verified Savings (kW)	Net Verified Savings at 2022 (kW)
2020	49	48	61.3%	30	30
2021	674	670	61.3%	411	411
2022	1,098	1,092	61.3%	669	669
Total	**1,820**	**1,811**	**61.3%**	**1,110**	**1,110**

Table 4-3 provides energy and summer peak demand sample realization rates for the PY2020 through PY2022 Interim Framework Kanata North Retrofit Program sample. The program achieved a 93.96% energy realization rate and a 99.47% summer peak demand realization rate. Sample results achieved 9.8% precision at the 90% confidence level for energy realization rates and 7.1% precision at the 90% confidence level for summer peak demand savings.

Table 4-3: PY2020-2022 Kanata North Retrofit Program Sample Realization Rates

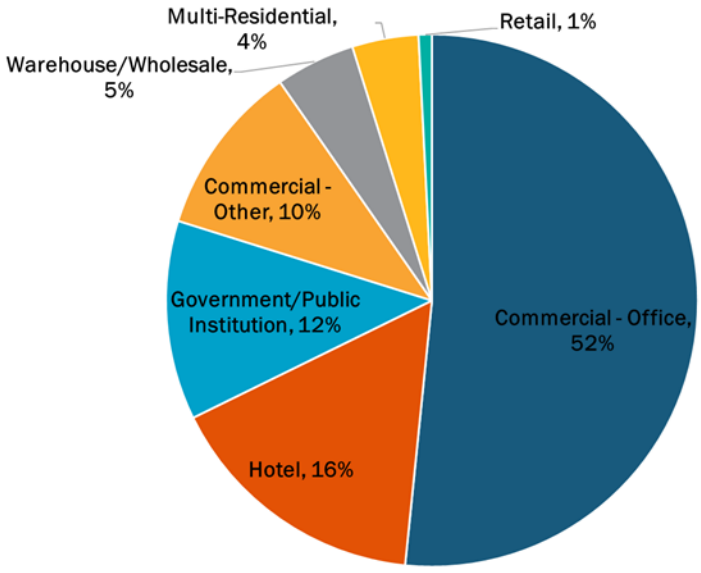
Energy Realization Rate	Energy RR Relative Precision at 90% Confidence	Summer Peak Demand Realization Rate	Demand RR Relative Precision at 90% Confidence
93.96%	9.8%	99.47%	7.1%

Verified energy and demand savings for prescriptive lighting projects were the main driver responsible for the energy and demand realization rates below 100%. Prescriptive lightings projects accounted for 19.5% and 20.4% of the reported energy savings in the program population and sample, respectively. The realization rate for the twelve sampled prescriptive lighting projects was 56% and 74% for energy and summer peak demand, respectively, mainly attributable to verified hours of operation less than reported and inaccurate baseline wattage assumptions for these prescriptive lighting measures.

4.2. Participation and Net Savings by Facility Type

During the evaluation period, the program completed 58 Kanata North Retrofit projects. This section describes the makeup of these projects in terms of measure counts and first-year net verified energy and summer peak demand savings by facility and measure types. Figure 4-1 displays the percentage of total measures by facility type within the population.

Figure 4-1: Measure Count Percentage by Facility Type



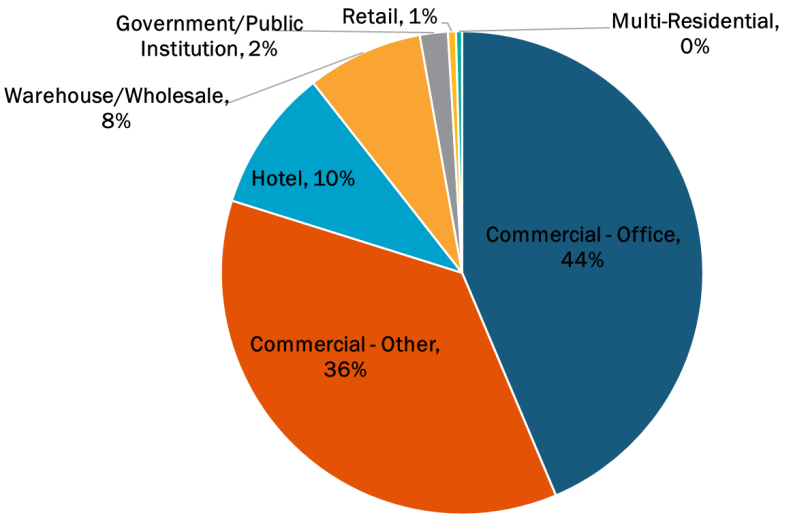
* Commercial (other) includes Entertainment/Sports facilities

By measure count, the Office facility type was the most common project, representing 52% of all installed measures. The next most common facility types were: Hotel (16%); Government/Public Institutions (12%); Commercial—Other (10%); Warehouse/Wholesale (5%);

Multi-Residential (4%); and Retail (1%). The Commercial—Other category contains facilities with a "Commercial—Other" building-type designation in the IESO dataset, plus Entertainment/Sport Facilities.

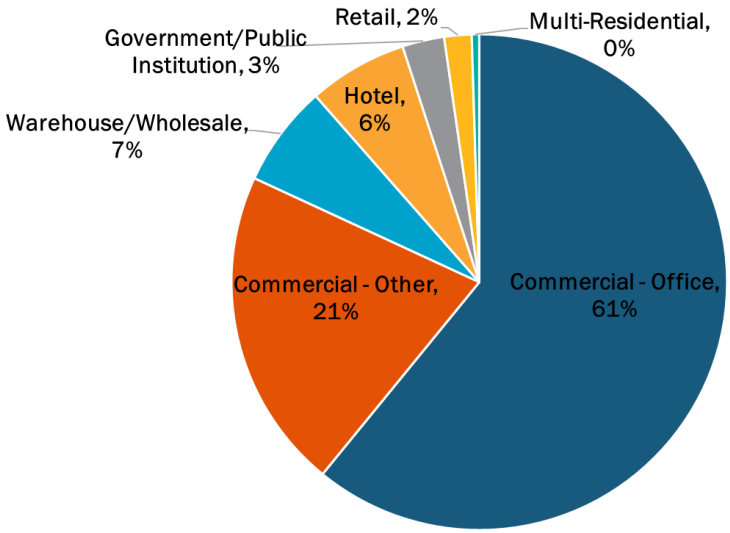
Though the Office facility type made up 52% of installed measures, it accounted for a lower contribution — only 44% of total net verified first-year energy savings for the program, as shown in Figure 4-2. This still remained the largest facility type contributor to net verified first-year energy savings, but the Commercial—Other facility type accounted for 36% of net verified first-year energy savings, though including only 10% of the total measure count. Other facility-type contributions to net verified first-year energy savings included the following: Hotel (10%); Warehouse/Wholesale (8%); Government/Public Institution (2%); Retail (1%); and Multi-Residential (0.4%).

Figure 4-2: Net Verified First-Year Energy Savings Percentage by Facility Type



While the Office facility type accounted for 44% of program energy savings, it posed a larger impact on net verified first-year summer peak demand savings, accounting for 61% of program demand savings, as shown in Figure 4-3. The next largest contributors to program demands savings were as follows: Commercial—Other (21%); Warehouse/Wholesale (7%); Hotel (6%); Government/Institution (3%); Retail (2%); and Multi-Residential (0.5%).

Figure 4-3: Net Verified First-year Summer Peak Demand Savings Percentage by Facility Type



4.3. Measure Categories

Kanata North Retrofit program projects can be split into two different types: lighting and non-lighting, and each type has a Custom and Prescriptive track. Table 4-4 presents energy savings for each program measure track and type in the Kanata North Retrofit population.

Table 4-4: Energy Savings by Measure Track

Measure Track & Type	Gross Reported Savings	Gross Verified Savings	Net Verified Savings	Net Verified Energy Savings % Program Contribution
Prescriptive Lighting (MWh)	1,921	1,805	1,107	19.5%
Prescriptive Non-Lighting (MWh)	5	5	3	0.1%
Custom Lighting (MWh)	1,652	1,552	952	16.7%
Custom Non-Lighting (MWh)	6,296	5,916	3,627	63.8%
TOTAL	9,875	9,279	5,689	100%

The Custom measure track represented 80.5% of total, net verified, first-year energy savings achieved by the program, with 16.7% from Custom Lighting and 63.8% from Custom Non-Lighting. Prescriptive Non-Lighting represented less than 1% of the total, net verified, first-year energy savings, and the Prescriptive Lighting measures accounted for the remainder of net verified, first-year energy savings, for 19.5% of program achievement.

Table 4-5 presents summer peak demand savings for each measure track and type in the Kanata North Retrofit population.

Table 4-5: Summer Peak Demand Savings by Measure Category

Measure Track & Type	Gross Reported Savings	Gross Verified Savings	Net Verified Savings	Net Verified Demand Savings % Program Contribution
Prescriptive Lighting (kW)	355	353	217	19.5%
Prescriptive Non-Lighting (kW)	8	8	5	0.5%
Custom Lighting (kW)	336	334	205	18.5%
Custom Non-Lighting (kW)	1,121	1,115	683	61.6%
TOTAL	1,820	1,811	1,110	100%

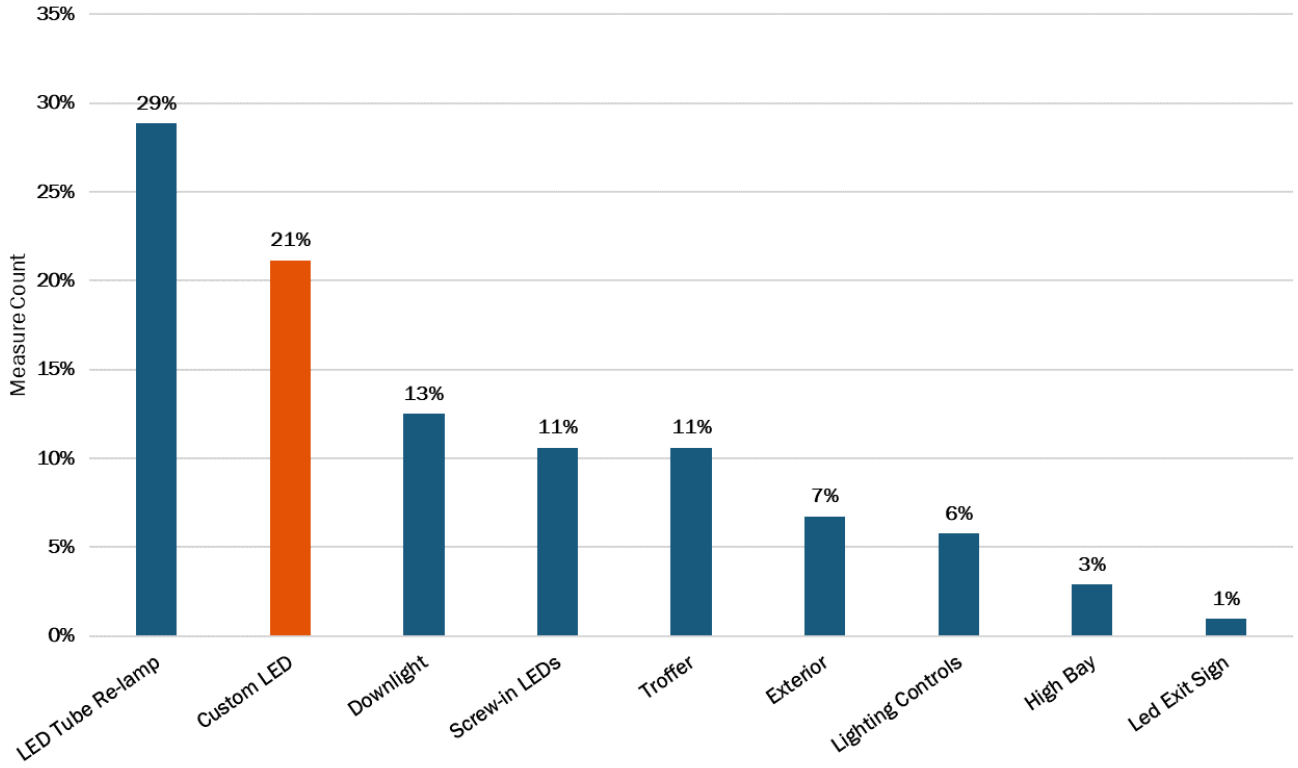
The Custom measure track represented 80% of total, net verified, first-year summer peak demand savings achieved by the program—18.5% from Custom Lighting and 61.6% from Custom Non-Lighting. Prescriptive Non-Lighting represents less than 1% of total, net verified, first-year demand savings, and the Prescriptive Lighting measures account for the remainder of net verified, first-year demand savings, representing 19.5% of the program's achievement.

4.3.1. Lighting Measures

Lighting measures contributed 36% and 38% of total net verified first-year energy and summer peak demand savings, respectively. This contrasted with the PY2022 IF Retrofit provincial program results, in which lighting measures contributed 43% and 65% of total net verified first-year energy and summer peak demand savings, respectively.

Figure 4-4 shows the measure count percentage of total lighting measures by category, with Prescriptive measures shown in blue and Custom measures shown in orange. LED Tube Re-lamps presented the most common lighting measure type (29%), followed by Custom LEDs (21%), Downlights (13%), Screw-in LEDs (11%), Troffer (11%), Exterior (7%), Lighting Controls (6%), High Bay (3%), and LED Exit Signs (1%).

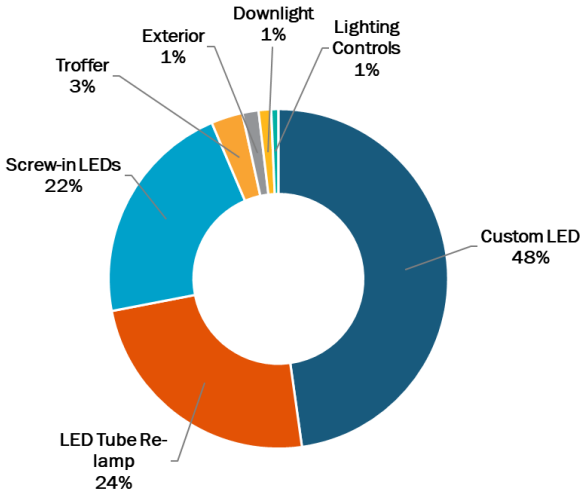
Figure 4-4: Lighting Measures Count and Percentages



* Does not sum to 100% due to rounding.

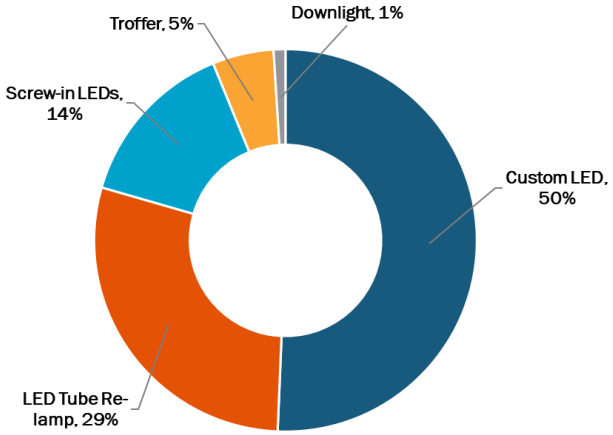
Figure 4-5 and Figure 4-6 display the percentage of net verified, first-year energy and summer peak demand savings by lighting measure category. Although LED Tube Re-lamps represented the program's most common lighting measure, Custom LEDs ranked first for energy (48%) and demand (50%) savings achieved. LED Tube Re-lamps ranked second for energy (24%) and demand savings (29%), followed by Troffer ranking third for energy (3%) and demand (5%). All other categories contributed 1% or less to net verified, first-year energy and demand savings.

Figure 4-5: Lighting Net Verified Energy Savings Percentages



* Measure categories that contribute less than 0.5% of total savings are not included.

Figure 4-6: Lighting Net Verified Summer Peak Demand Savings Percentages



* Does not sum to 100% due to rounding. Measure categories that contribute less than 0.5% of total savings are not included.

4.3.2. Non-Lighting Measures

Non-lighting measures contributed 64% and 62% of total, net verified, first-year energy and summer peak demand savings, respectively. This contrasted with the PY2022 IF Retrofit provincial program results, in which non-lighting measures contributed 57% and 35% of total, net verified, first-year energy and summer peak demand savings, respectively.

Figure 4-7 displays the measure count percentage of total, non-lighting measures by category, with Prescriptive measures shown in blue and Custom measures shown in orange. HVAC RTU represented the most common non-lighting measure type (35%), followed by BAS (25%), Unitary AC (20%), VFD (10%), HVAC (5%), and UPS (5%). The HVAC measure type consisted of a single project that addressed comprehensive HVAC upgrades, including RTUs, Chillers, Ice Storage demand shifting, and controls.

Figure 4-7: Non-Lighting Measures Count and Percentages

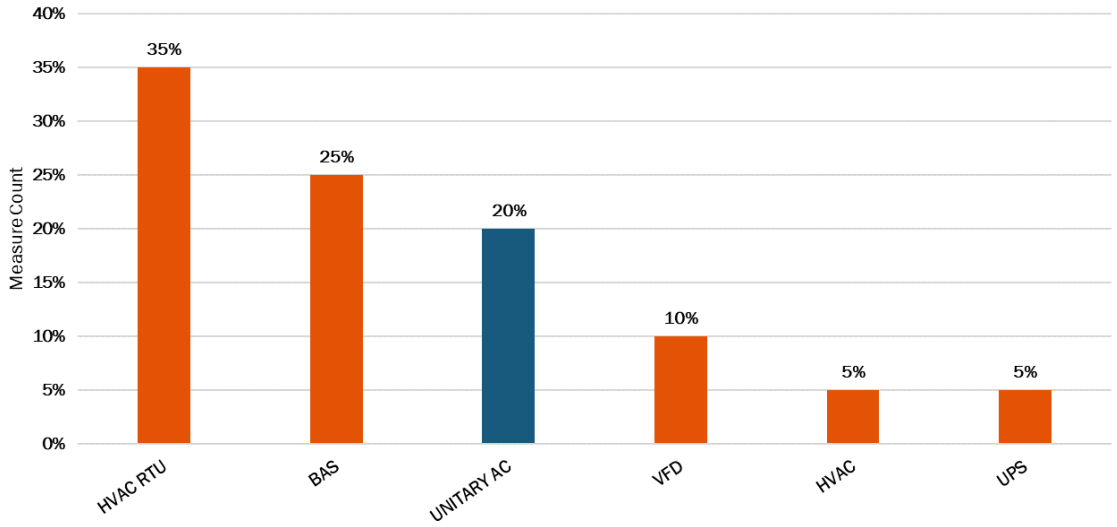
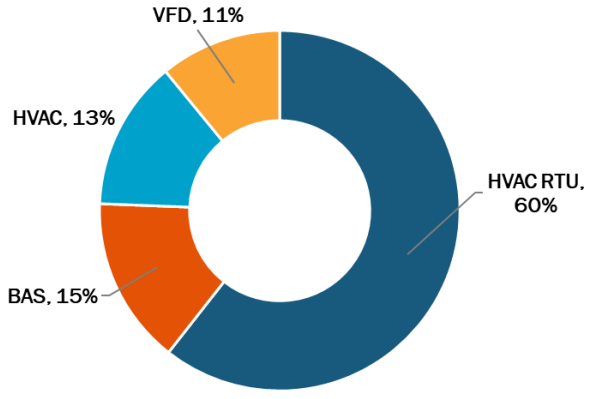


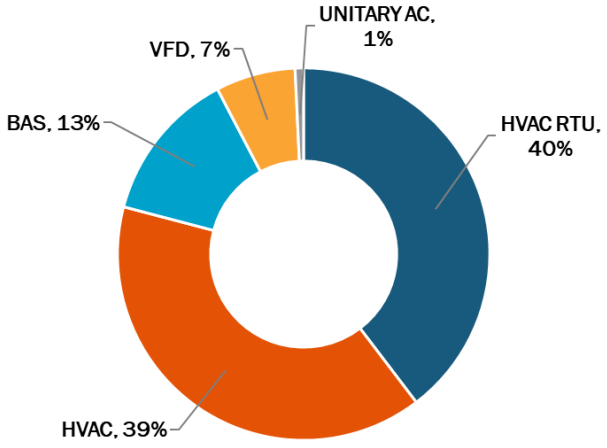
Figure 4-8 and Figure 4-9 display the percentage of net verified, first-year energy and summer peak demand savings by the non-lighting measure category. HVAC RTU proved to be the program's most common non-lighting measure of the program and contributed the largest energy percentage (60%) and demand (40%) savings achieved. BAS ranked second for energy (15%) but came in third for demand savings (13%), followed by HVAC ranked third for energy (13%) but coming in second for demand (39%). VFDs ranked fourth for energy (11%) and demand (7%). All other categories contributed 1% or less toward net verified, first-year energy and demand savings.

Figure 4-8: Non-Lighting Net Verified Energy Savings Percentages



*Does not sum to 100% due to rounding. Measure categories contributing less than 0.5% of total savings are not included.

Figure 4-9: Non-Lighting Net Verified Summer Peak Demand Savings Percentages



*Does not sum to 100% due to rounding. Measure categories contributing less than 0.5% of total savings are not included.

4.4. Savings Persistence

The PY2020 through PY2022 Kanata North Retrofit Program is expected to achieve 71,800 MWh of lifetime, net verified energy savings, based on installed measures and their respective effective useful lives (EULs). The program's lifetime savings depend on EULs of implemented measures, thus describing how long savings associated with each measure should persist. Figure 4-10 and Figure 4-11 show the persistence of total net energy and demand savings, respectively.

Figure 4-10: Net Energy Savings Persistence

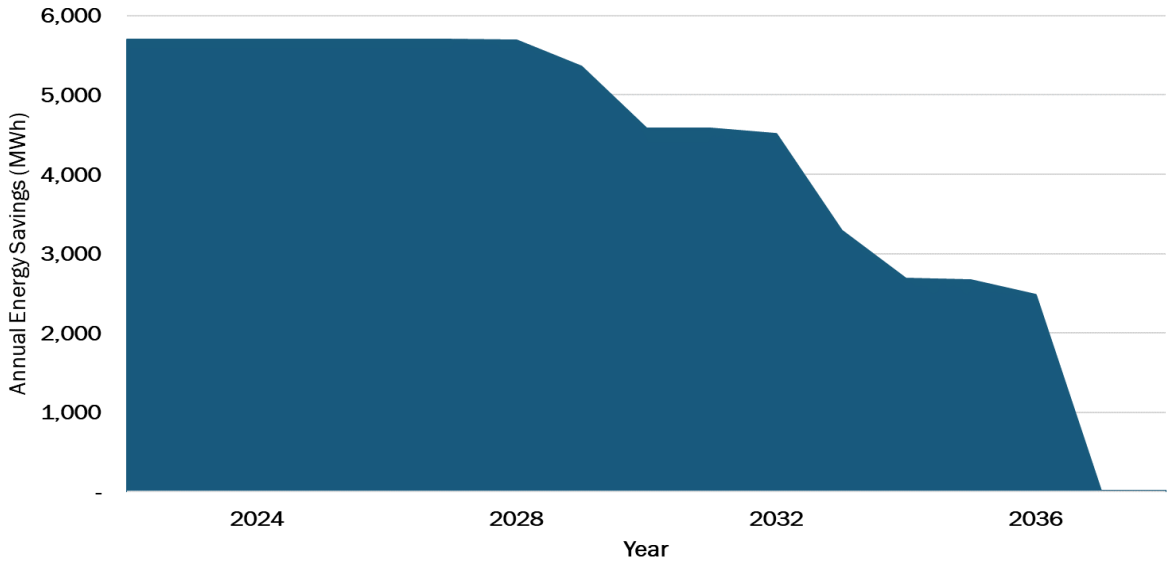
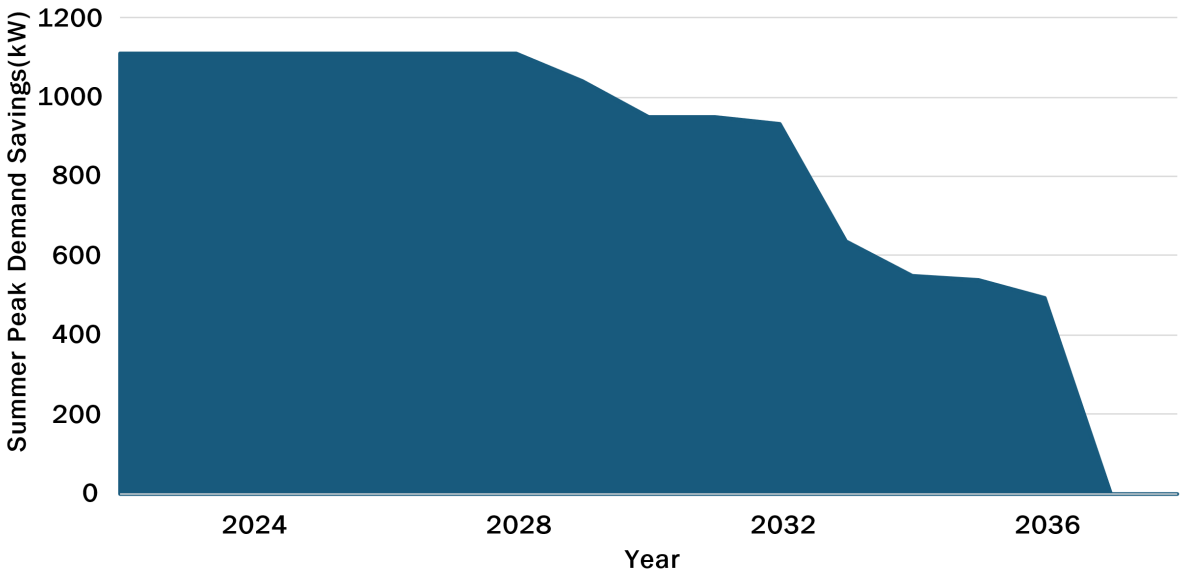


Figure 4-11: Net Summer Peak Demand Savings Persistence



Until the end of framework accounting period (2022), 100% of net energy and demand savings persisted, with 43% and 44% of net energy and demand savings persisting until 2036, respectively. The annual savings amount that persists past the first program year begins to fall when certain measures reach the end of their EULs. The shortest EUL for any measure in the program population is eight years for various lighting and HVAC controls projects. Less than one-half of initial first-year energy (47%) and demand savings (49%) will persist until 2034.

4.5. Key Impact Evaluation Findings

The key impact findings follow.

4.5.1. Increased demand savings per project.

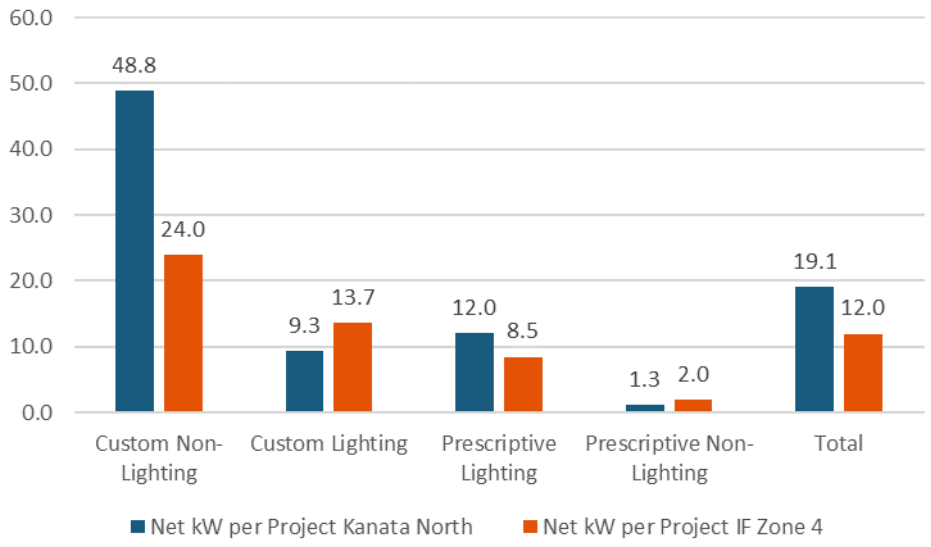
The local program's Custom portion offered incentives up to $1,200/kW for lighting and $2,400/kW for non-lighting—three times higher than those offered by the existing provincial IF Retrofit program.

These increased incentives resulted in higher summer peak demand savings per project when compared to results for the PY2022 IF Retrofit Program North-East zone (zone 4), which cover the Kanata region. Comparing results to zone 4 helps minimize regional differences between program participants that could impact demand savings per project, such as climate and facility types.

Figure 4-12 shows the Kanata North Retrofit program achieved an overall total of 19.1 kW per project of net verified summer peak demand savings compared to only 12.0 kW per project for the IF Retrofit program zone 4. The largest driver of this increased demand savings per project was the Custom Non-Lighting project track, which achieved 48.4 kW per project in the local program and 24.0 kW per project in the provincial program.

In addition to delivering the highest demand savings per project, the Custom Non-Lighting track contributed 61.6% of total program, net verified, summer peak demand savings for the local program, while the same category accounted for only 30% of the provincial program's total, net verified, summer peak demand savings for zone 4. These findings demonstrate that higher incentive levels, specifically the $2,400/kW for custom non-lighting projects, helped drive increased summer peak demand savings.

Figure 4-12: Net Summer Peak Demand Savings per Project



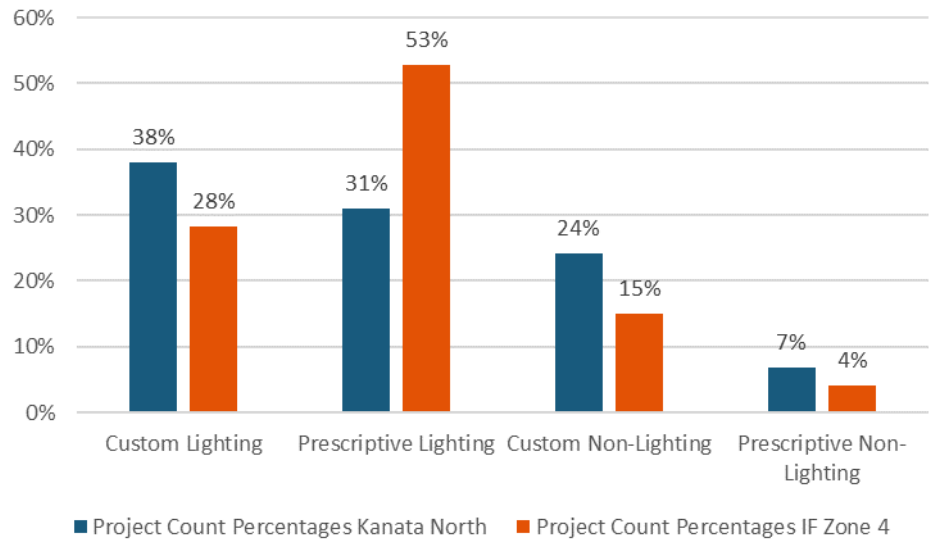
4.5.2. Project mix targeted top demand reducing project types.

The Kanata North Retrofit program employed a targeted outreach strategy with three full-time resources, seeking to motivate customers to implement conservation measures that drove more energy and summer peak demand savings in this critically grid-constrained area.

The impact evaluation results indicate that the actual mix of implemented projects in the Kanata North Retrofit program favored projects with historically delivered, higher-peak demand savings per project, compared to results for zone 4 of the provincial program.

Figure 4-13 indicates that, compared to the zone 4 results of the provincial program, the Kanata North Retrofit program drove increased participation in the Custom Non-Lighting and Custom Lighting Tracks, increasing these project count percentages from 15% to 24% and from 28% to 38%, respectively. As shown in Figure 4-12, the Custom Non-Lighting project category provided the highest demand savings per project for local and provincial programs. While the Custom Lighting project category underperformed in the Prescriptive Lighting project category on a demand savings per project basis for the Kanata North Retrofit program, Custom Lighting projects outperformed Prescriptive Lighting projects in demand savings per project in the provincial IF Retrofit program for both zone 4 and the provincial level.

Figure 4-13: Project Count Percentages by Track and Type



4.5.3. The goals and objectives of the program were broadly achieved.

Table 4-6 presents the Kanata North Retrofit program's high-level goals and overall success in achieving these goals, as described in the LDC Local Program Fund Approved Business Case. Kanata North Retrofit program goals included the following:

- Drive more energy and peak demand savings among commercial accounts in the Kanata North area.
- Increase participation among commercial accounts in the Kanata North area.
- Deliver the program with increased incentives and administrative costs while maintaining cost-effectiveness.

Table 4-6: Goals and Success of the Kanata North Retrofit Program

Goal	Mechanism	Target	Achieved?
Drive more energy and peak demand savings among commercial accounts in the Kanata North area.	Offer a triple incentive in concert with a targeted outreach strategy.	Higher summer peak demand savings per project compared to the regular retrofit program.	Yes

Goal	Mechanism	Target	Achieved?
Increase participation in conservation programs among commercial accounts in the Kanata North area, which historically underachieves participation metrics compared to the rest of Hydro Ottawa's service territory	Address barriers, including lack of capital, lack of technical knowledge, and limited staff availability to identify and manage projects and/or complete the necessary incentive application steps by offering triple incentives and technical and administrative project support.	135 or more total projects implemented through the program across all program years.	No
Achieve a minimum Total Resource Cost (TRC) Ratio and Program Administrator Cost (PAC) Ratio greater than 1	Achieve targeted energy and peak demand savings and participation numbers.	TRC ratio > 1.0 PAC ratio > 1.0	Partial

The Kanata North Retrofit program did not achieve its participation target of implementing 135 total projects. However, Section 7 of this report provides additional context on how project counts were impacted by COVID-19 and by larger-than-expected actual project sizes. Targeting increased summer peak demand savings per project succeeded as the average project achieved 60% higher summer peak demand savings than those implemented in zone 4 of the regular IF retrofit program during PY2022. The program's cost-effectiveness goals served as a partial success because the program achieved a 2.02 PAC ratio, though the TRC ratio did not reach this metric, achieving a 0.45 TRC ratio. The TRC ratio was less than 1.0 due to program measures having high incremental costs, which program administrators have little control over.

4.6. Net-to-Gross Evaluation

Table 4-7 presents the results of the PY2020 through PY2022 Kanata North Retrofit Program NTG evaluation. Though the evaluation team targeted 90% confidence and 10% precision levels in the savings results, these were not achieved due to low project volumes. Instead, 85% confidence and 15% precision levels were considered when calculating NTG; 85% confidence and 10.6% precision levels were achieved. Participant feedback indicates high free-ridership levels at 38.7%.

Table 4-7: Retrofit Net-to-Gross Results

Unique Participants	NTG Responses	Savings Weighted Free-ridership	Spillover – Energy	Spillover – Summer Demand	Weighted NTG – Energy	Weighted NTG – Summer Demand	Energy NTG Precision at 85% Confidence
27	12	38.7%	0.0%	0.0%	61.3%	61.3%	± 10.6%

Two participants stated they would have done the "exact same upgrade anyway" in the program's absence, which indicates higher free-ridership for these respondents. Five respondents showed no indication of free-ridership as they said they would have put off the upgrade for at least one year (four respondents) or cancelled their upgrade all together (one respondent). The evaluation team considered other respondents as partial free-riders if they reported that they would have scaled back on the size, efficiency, or scope of their project (three respondents) or if they did not know what they would have done in the program's absence (two respondents). Program participation did not result in spillover. Appendix D provides additional analyses performed to assist in interpretation of these values.

5. Cost-Effectiveness

The evaluation team determined cost-effectiveness for the IF Kanata North Retrofit program using the IESO's CE Tool V7.1. Table 5-1 presents cost-effectiveness results for each program year as well as a comparison to provincial PY2022 IF Retrofit program cost-effectiveness results. The Kanata North Retrofit program achieved a Program Administrator Cost (PAC) ratio of 2.02, with each program year 2020 through 2022 passing the PAC test with benefits exceeding their respective costs for the program year.

Table 5-1: Cost-Effectiveness Results

PAC Test	Kanata North Retrofit Program PY2020	Kanata North Retrofit Program PY2021	Kanata North Retrofit Program PY2022	Kanata North Retrofit Program Total	PY2022 IF Retrofit Program
PAC Costs ($)	$26,164	$752,267	$986,914	**$1,747,346**	$26,994,400
PAC Benefits ($)	$65,279	$1,039,310	$2,417,670	**$3,522,260**	$122,837,292
PAC Net Benefits ($)	$39,115	$287,043	$1,448,756	**$1,898,157**	$95,842,892
PAC Net Benefit (Ratio)	2.50	1.38	2.50	**2.02**	4.55
Levelized Unit Energy Cost (LUEC)	**Result**				
$/kWh	$0.03	$0.05	$0.02	**$0.04**	$0.01
$/kW	$96.24	$218.64	$138.57	**$178.02**	$133.31

The provincial IF Retrofit program achieved higher cost-effectiveness results in PY2022 than the Kanata North Retrofit program. This result was not unexpected due to the Kanata North program's design carrying additional incentive payment costs, given higher incentives (up to 300%) of those offered in the IF retrofit program.

Additionally, the three full time staff specifically working on the Kanata North Retrofit program's implementation (one EM, one PO, and a sales support agent) required additional administrative costs. Carrying these higher costs sought to motivate participants to implement conservation measures that drive increased peak demand savings while remaining cost-effective at the program level.

This goal appears to have succeeded from a PAC test perspective. While the PAC ratio was not as high as the provincial IF Retrofit program, it still passed the PAC test and was significantly higher than the minimum projected 1.06 PAC ratio from the LDC Local Program Fund Approved business case.

Additionally, the LUEC result of $178.02/kW was 34% in higher costs per kW saved than the provincial IF Retrofit program result of $133.31, while the LUEC of $0.04/kWh was 288%[1] higher in costs per kWh saved than the provincial IF Retrofit program result of $0.01. Consequently, the Kanata North retrofit program could focus resources on projects that resulted in higher peak demand savings compared to the provincial IF Retrofit program.

[1] The percentage increase in Kanata North Retrofit program LUEC $/kWh was calculated using unrounded results.

6. Avoided Greenhouse Gas Emissions

The evaluation team used the IESO's CE Tool V7.1 to calculate the avoided GHG emissions. First year and lifetime avoided GHG emissions were calculated for each program year and the overall program total. Table 6-1 below represents the results of the avoided GHG emissions calculations. First year avoided GHG emissions from electricity savings were reduced by the increase in GHG consumption resulting from the gas-heating penalty, resulting in 546 Tonnes of first year avoided emissions for the Kanata North Retrofit program. The majority of these first year avoided emissions (98%, or 534 Tonnes CO2 equivalent) are attributed to PY2022 projects. Kanata North Retrofit program projects are expected to achieve a total of 8,848 Tonnes of avoided GHG throughout the EUL of the installed measures. All GHG emissions shown are in Tonnes of CO_2 equivalent, unless otherwise noted.

Table 6-1: IF Retrofit Avoided Greenhouse Gas Emissions

Program Year	Electric First Year GHG Avoided	Gas* First Year GHG Avoided	Total First Year GHG Avoided	Electric Lifetime GHG Avoided	Gas* Lifetime GHG Avoided	Total Lifetime GHG Avoided
2020	10.87	(10.72)	0.15	179.25	(123.20)	56.05
2021	215.37	(203.54)	11.84	3,251.47	(2,374.17)	877.30
2022	630.29	(96.25)	534.04	9,038.98	(1,124.58)	7,914.40
Total	**856.53**	**(310.51)**	**546.02**	**12,469.70**	**(3,621.95)**	**8,847.74**

*Interactive gas penalty

7. Process Evaluation

The evaluation team performed a process evaluation to better understand the program's design and delivery. The effort included an interview with LDC staff as well as a participant survey to gather primary data in supporting the evaluation. The following discussion shows counts rather than percentages if a question received fewer than 20 respondents. In such cases, results should be considered directional, given the small number of respondents.

7.1. LDC Staff Perspectives

The following subsections highlight feedback received from the LDC staff in-depth interviews (IDI).

7.1.1. Key Findings

Key findings from LDC staff IDIs include the following:

- The program's unique design and delivery approach included an incentive of up to $2400/kW for non-lighting measures and $1200/kW for lighting measures, triple that of the provincial Retrofit Program.
- Additionally, the program provided enhanced customer support level provided by three full-time staff resources (an Energy Manager (EM), a Program Officer (PO), and a Sales Support Agent), dedicated to assisting customers navigate the process.
- Marketing and outreach activities included an e-mail campaign and a webinar, but the effort emphasized direct phone outreach and in-person interactions.
- LDC staff stated that the increased incentive, coupled with enhanced support levels provided by Hydro Ottawa Limited (HOL) served as a key program strength.
- LDC staff stressed the importance of pre-existing relationships that HOL built over the years in further driving the program's success.
- The COVID-19 pandemic caused some delays in completing projects related to technical expertise entering the country and supply chain issues.
- LDC staff reported that the higher incentive amount resulted in higher participation levels, with staff noting that some projects would likely not have occurred without the higher incentives.
- LDC staff said, if they were to offer the program again, they would consider offering it for a longer duration and potentially reducing the incentive amount to twice rather than triple the incentive offered under the provincial Retrofit Program (up to $1,600/kW as compared to $2,400/kW for non-lighting measures and up to $800/kW as compared to $1,200/kW for lighting measures).

7.1.2. Design and Delivery

LDC staff reported that the program's goal was to target Hydro Ottawa's grid-constraints in the Kanata-North area, where transformers are approaching capacity. To achieve these goals, and as indicated in Section 1.1, the program tripled the incentive (up to $2,400/kW for non-

lighting measures and up to $1200/kW for lighting measures) offered under the provincial Retrofit Program.

As indicated in Section 1.1, the program's targeted communication strategy, where three full-time resources, including an EM, a PO, and a sales support agent, assisted customers through the participation process. This combined strategy was intended to drive participation by offering a compelling value proposition to potential participants.

LDC staff reported that this approach allowed them to provide a "white glove" service and support level when working with customers in submitting their applications. The EM primarily targeted and assisted large commercial customers, while the PO primarily targeted and assisted small businesses and less complex commercial customers. The Sales Support Agent primarily took responsibility for the application submission process, administrative work, and standard customer communications related to the application.

LDC staff noted that their team's comfort and understanding of program rules helped minimize work for the client and for the IESO's technical reviewer during the review and approval process. They also noted that customers and trade allies only communicated with HOL, which simplified the overall participation process.

7.1.3. Outreach and Marketing

LDC staff reported that, given the program's design, they targeted marketing and outreach efforts to address a specific list of program-eligible customers in the Kanata North area. HOL was responsible for all customer marketing and outreach. Early activities included an e-mail campaign as well as a webinar inviting eligible customers' participation.

Additionally, the program employed two full-time staff who were dedicated to program marketing and outreach activities. These staff reached out to customers through a one-on-one approach, either by phone or through in-person interactions (e.g., cold-calling customers, knocking on doors of small businesses, informing larger customers who they engaged with on a more frequent basis as part of their typical business practices). LDC staff noted that these two staff were HOL employees that had relationships with most key accounts.

7.1.4. Strengths, Barriers, and Opportunities

LDC staff said the program's enhanced customer support levels, combined with the increased incentive, served as a key strength. They thought that programs such as these, when offered to targeted customer groups, proved very effective when combined with LDC support.

Staff also reported that the program's approach to marketing and outreach, which heavily focused on one-on-one interactions with customers, also was a program strength. This allowed the program to provide an enhanced quality and service level to participants.

Additionally, LDC staff cited another key program strength: pre-existing relationships that HOL had built over the years with many eligible customers and their trade allies. They noted that this trust level, plus participation support and the increased incentive, played a major role in pushing some very large projects forward for approval.

LDC staff said the program quickly became fully subscribed through its original budget. Staff also reported they expected to receive a higher volume of applications associated with smaller projects; instead, they received a smaller number of applications associated with larger projects. This directly impacted how quickly the program became subscribed. Staff found they could successfully work with the IESO to increase the program budget via a contractual amendment, and they subscribed the majority of the additional budget before the Interim Framework's submission deadline.

LDC staff reported that the program faced some delays due to the pandemic affecting technical expertise entering the country and supply chains. Additionally, staff reported that the higher incentive amount resulted in higher participation levels, noting that some projects likely would not have occurred without the higher incentives.

Finally, LDC staff reported that, if they administered the program again, they would consider offering it for a longer duration. They also said they might consider reducing the incentive amount to double (up to $1,600/kW for non-lighting measures and up to $800/kW for lighting measures) rather than triple (up to $2,400/ per kW for non-lighting measures and up to $1,200/kW for lighting measures) the provincial Retrofit Program incentive amount) as the doubled incentive might prove similarly effective in driving participation.

7.2. Participant Perspectives

The following subsections highlight feedback received through the participant survey. Appendix D.2 provides additional results.

7.2.1. Key Findings

Key findings from participants' responses include the following:

- Most respondents (eight) learned about the Kanata North Retrofit Program from a contractor or equipment vendor.
- Most respondents indicated they would not have been likely to complete their project at the same scope (seven), timeline (nine), and energy-efficiency level (eight) had the incentive been reduced by two-thirds.
- Most respondents (nine) were able to install all energy-efficient models or equipment types of interest to them.
- Many respondents (seven out of ten) indicated that the higher incentive reduced the time required for their company to complete the project approval process.
- Three respondents indicated that their company applied to the other energy-efficiency programs before participating in the Kanata North Retrofit Program.

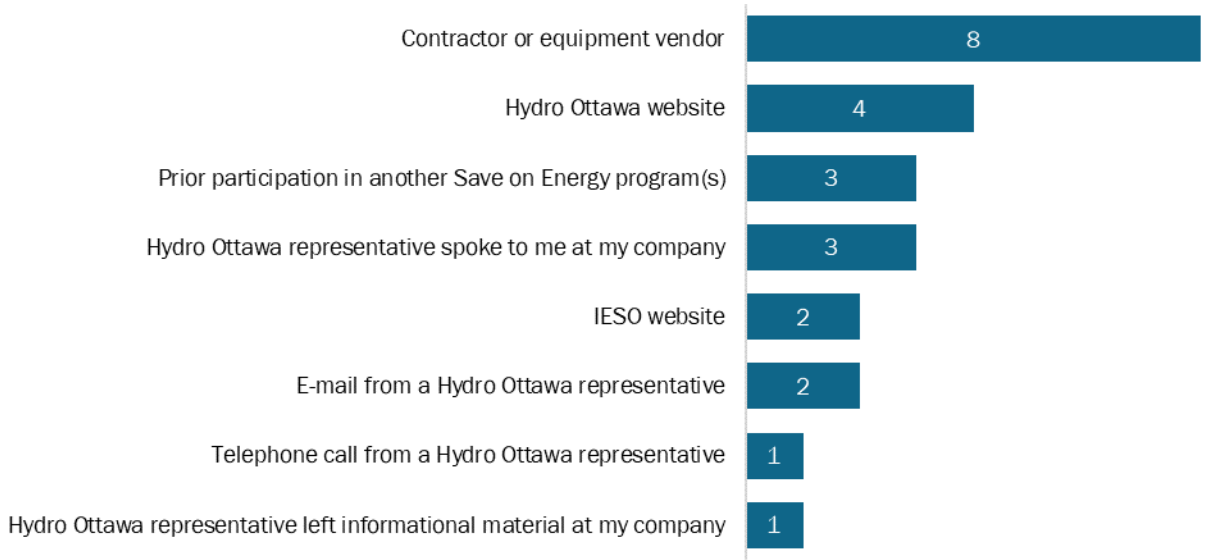
- Recommendations for program improvements varied widely and included improving/increasing marketing, providing more technical support, expanding the eligible geographic area, improving collaboration between stakeholders, simplifying the application process, and improving communication from the IESO.
- Less than one-half of respondents (five out of twelve) said their company plans to complete electrification projects in the next six months to three years.
- Respondents most commonly recommended that the program include additional lighting (two) and solar PV systems (two).

7.2.2. Awareness Sources

As shown in Figure 7-1, respondents first learned about the Kanata North Retrofit Program through a contractor or equipment vendor (eight). Respondents also learned about the program from the Hydro Ottawa website (four), prior participation in a Save on Energy Program (three), and a Hydro Ottawa representative who spoke to them at their company (three).

Figure 7-1: Sources of Awareness

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



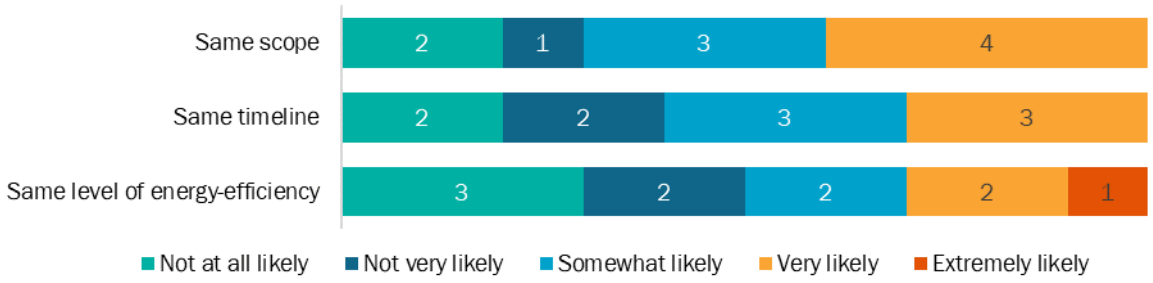
* Counts displayed rather than percentage due to small n.

7.2.3. Incentive Impact

The evaluation team asked participants to rate the likelihood of their company completing their projects at the same scope, timeline, and energy-efficiency level that they did if the incentive amount was reduced by one-third, one-half, or two-thirds. Respondents used a scale where one meant “not at all likely” and five meant “extremely likely” to have completed the project.

Figure 7-2 shows that, had the incentive been reduced by one-third, at least one-half of respondents would have been likely to complete their project at the same scope (seven of ten respondents with a 3, 4, or 5 rating), timeline (six of ten respondents with a 3, 4, or 5 rating), and energy-efficiency level (five of ten respondents with a 3, 4, or 5 rating).

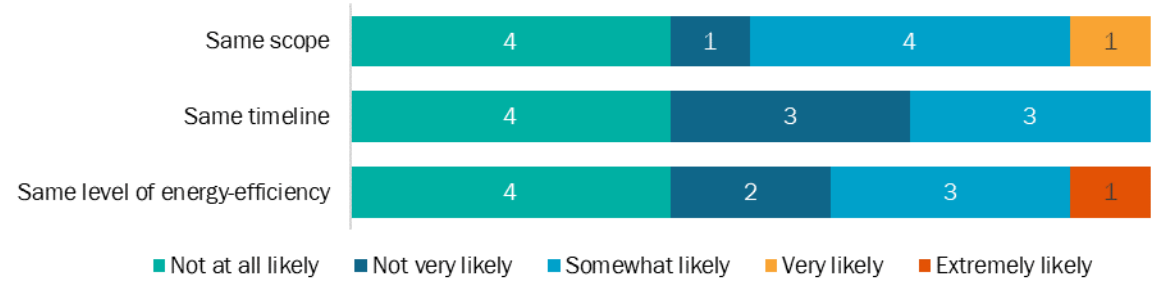
Figure 7-2: Incentive Reduction of One-Third (n=10)*



* Counts displayed rather than percentage due to small n.

Figure 7-3 shows that, upon reducing the incentive by one-half, fewer respondents would have been likely to complete their project at the same scope (five respondents with a 3, 4, or 5 rating), timeline (three respondents with a 3, 4, or 5 rating), or efficiency level (four respondents with a 3, 4, or 5 rating).

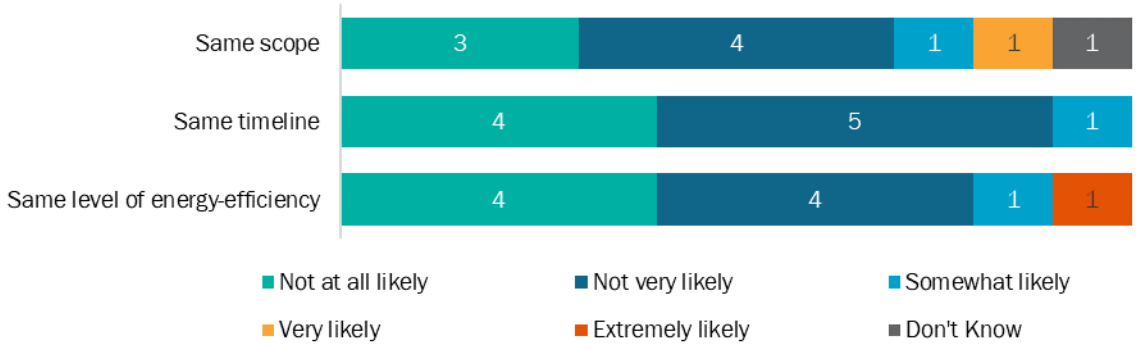
Figure 7-3: Incentive Reduction of One-Half (n=10)*



* Counts displayed rather than percentage due to small n.

Figure 7-4 shows that, had the incentive been reduced by two-thirds, respondents rarely indicated that they would have been likely to complete their project at the same scope (two respondents with a 3, 4, or 5 rating), timeline (one respondent with a 3, 4, or 5 rating), and efficiency level (two respondents with a 3, 4, or 5 rating).

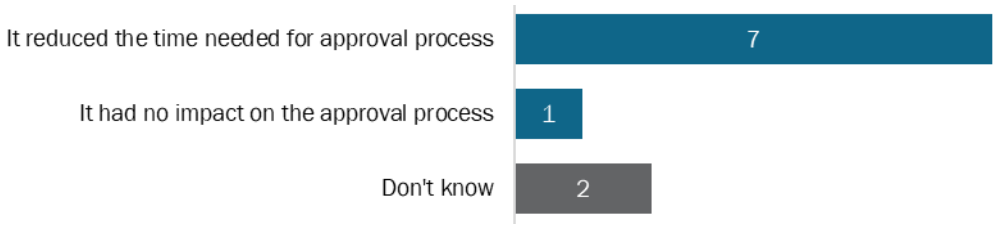
Figure 7-4: Incentive Reduction of Two-Thirds (n=10)*



* Counts displayed rather than percentage due to small n.

As shown in Figure 7-5, seven out of ten respondents indicated that the higher incentive reduced the time required to navigate their company's approval process.

Figure 7-5: Impact of Higher Incentive on Approval Process (n=10)*



* Counts displayed rather than percentage due to small n.

7.2.4. Availability of Equipment Types and Models

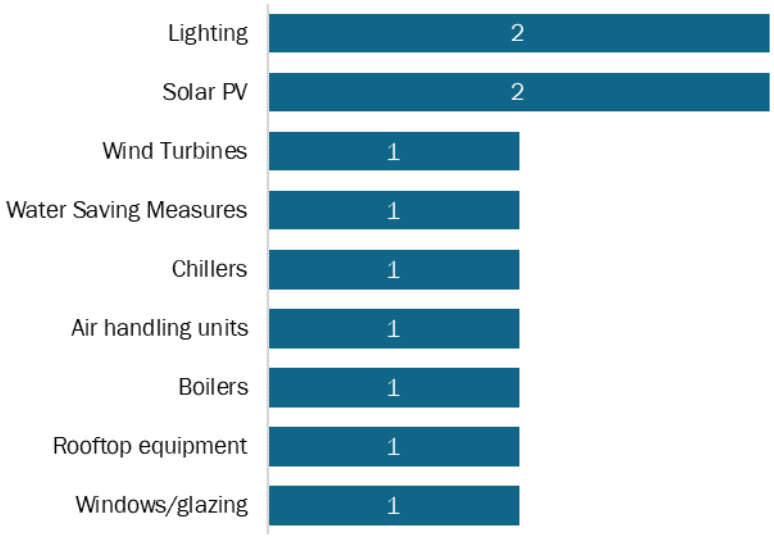
Nine out of twelve respondents indicated they were able to install all energy-efficient models or equipment that they were interested in through the Kanata North Retrofit Program. One respondent said they could not install all equipment they were interested in because they sought to install a rooftop unit. Two respondents did not know if they were able to install all equipment types and models that interested them.

7.2.5. Program Improvement Recommendations

As shown in Figure 7-6, six respondents offered recommendations for additional energy-efficient equipment or services to include in the Kanata North Retrofit Program. The most common recommendations included lighting (two respondents) and solar PV (two respondents).

Figure 7-6: Recommended Equipment or Services to Improve the Kanata North Retrofit Program

(Open-ended and multiple responses allowed; n=6)*



* Counts displayed rather than percentage due to small n. Does not sum to 6 due to multiple response.

The survey asked respondents for recommendations to improve the Kanata North Retrofit Program. Table 7-1 provides a full list of recommendations.

Table 7-1: Recommendations to Improve the Kanata North Retrofit Program

(Open-ended and multiple responses allowed; n=5)*

Recommendation	Respondents
Improve/Increase marketing	1
Provide more technical support	1
Expand eligible geographic area	1
Improve collaboration between stakeholders	1
Simplify application process	1
Improve communication from IESO	1

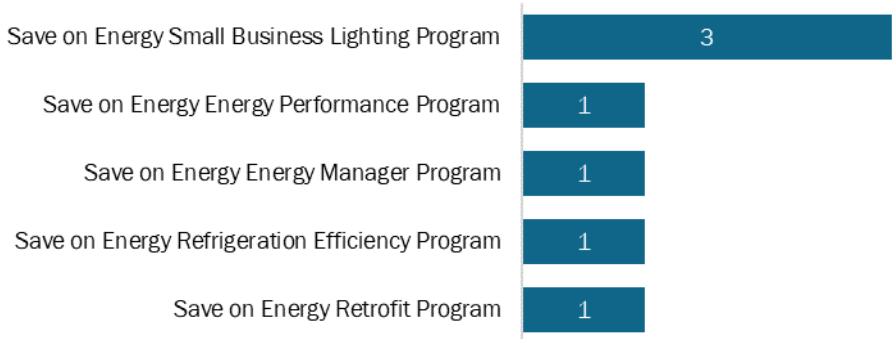
* Counts displayed rather than percentage due to small n. Does not sum to 5 due to multiple response.

7.2.6. Participation in Other Energy-Efficiency Programs

Five respondents indicated that their business applied to other energy-efficiency programs during the same year that they completed their project through the Kanata North Retrofit Program, as shown in Figure 7-7. Most commonly, respondents applied to the Small Business Lighting Program (three). Three of five respondents indicated that their company applied to other energy-efficiency programs before participating in the Kanata North Retrofit Program, and two respondents did not know when their company applied to other programs.

Figure 7-7: Applications to Other Energy-Efficiency Programs

(Open-ended and multiple responses allowed; n=5)*

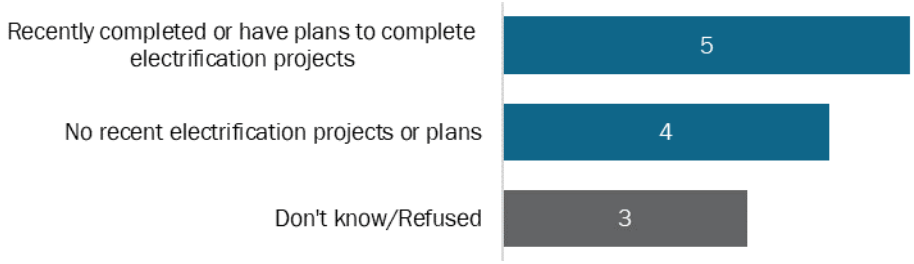


* Counts displayed rather than percentage due to small n.

7.2.7. Electrification Projects

Five respondents indicated that their organization recently completed or has plans to complete electrification projects at their facilities to address GHG emissions, as shown in Figure 7-8. Of the four respondents whose companies did not recently complete electrification projects, one indicated that their organization does not plan electrification projects as they rent their facilities.

Figure 7-8: Completion of Electrification Projects (n=12)*



* Counts displayed rather than percentage due to small n.

The evaluation team asked five respondents whose organizations recently completed or have plans to complete electrification projects about the timing of these projects. As shown in Figure 7-9, two respondents indicated their organization plans to complete the projects over the next two years. When asked what type of assistance their organization would find helpful in completing these electrification projects, three respondents noted more technical support, and two respondents wanted higher incentives.

Figure 7-9: Expected Timing of Electrification Projects (n=5)*

* Counts displayed rather than percentage due to small n.

8. Key Findings and Recommendations

Finding 1: The increased incentive, coupled with the enhanced customer support level, allowed most participants to complete their projects of a scope, size, and timeline that they would have otherwise been unlikely to reach. LDC staff reported that one of the program's key strengths was its unique design and delivery approach. This approach included an incentive amount triple (up to $2,400/kW for non-lighting measures and up to $1,200/kW for lighting measures) that of the provincial Retrofit Program. The enhanced customer support level, provided by the EM, PO, and Sales Support Agent also contributed to the program's unique design and delivery approach. LDC staff also reported that the higher incentive amounts resulted in higher participation levels, noting that some projects would likely not have occurred without the higher incentives. Participants reported that, had the incentive been reduced by one-third, one-half, or two-thirds, they would have been increasingly less likely to have completed their projects on the same scope, timeline, or energy-efficiency level. Most participants indicated that the higher incentive reduced the time that their company required to complete the project approval process. LDC staff reported that, were they to offer the program again, they would consider reducing the incentive amount to twice rather than triple the provincial Retrofit Program incentive (up to $1,600/kW as compared to $2,400/kW for non-lighting measures and up to $800/kW as compared to $1,200/kW for lighting measures).

- **Recommendation 1a:** If offering similar future programs, there may be room to reduce the incentive amount of up to $2,400/kW for non-lighting measures and up to $1,200/kW for lighting measures (triple the provincial Retrofit Program incentive) to an incentive amount of up to $1,600/kW for non-lighting measures and up to $800/kW for lighting measures (double the provincial Retrofit Program incentive) while still maintaining or increasing participation levels.
- **Recommendation 1b:** If offering similar future programs, continue the same enhanced customer support levels as those provided by the EM, PO, and Sales Support Agent.

Finding 2: The program largely succeeded and quickly became fully subscribed with larger projects. LDC staff said, despite project and supply chain delays caused by the COVID-19 pandemic, the program quickly became fully subscribed through its original budget due to application submissions associated with larger projects. LDC staff reported that they successfully worked with the IESO to increase the program budget through a contractual amendment, and they subscribed to the majority of that additional budget prior to the Interim Framework's submission deadline. Staff reported that, if they offered the program again, they would consider extending it for a longer duration.

- **Recommendation 2a:** If offering similar programs, consider requesting a larger budget from the outset to avoid the necessity of a contractual amendment.
- **Recommendation 2b:** If offering similar programs, consider extending the program for a longer duration.

Finding 3: Relationships that HOL developed with customers and trade allies over the years contributed to the program's success. LDC staff stressed how HOL's pre-existing relationships

built with many eligible customers and their trade allies served as a factor that helped drive the program's success. They explained that this trust level, in addition to the enhanced customer support (which was of the technical variety, especially for the larger and complex projects), and increased incentive levels (see **Recommendation 1a and 1b**), served as a major factor in pushing some very large projects towards approval.

- **Recommendation 3:** Continue developing existing relationships and looking for opportunities to create new relationships with customers and trade allies.

Finding 4: One-on-one marketing and outreach approaches effectively drove program participation. LDC staff reported that the program's strategy for marketing and outreach, which heavily focused on one-on-one interactions with customers, provided another program strength. Early activities included an e-mail campaign as well as a webinar inviting eligible customers' participation. Additionally, the program dedicated two full-time staff to program marketing and outreach activities. These staff reached out to customers using a one-on-one approach, either by phone or through in-person interactions (e.g., cold-calling customers, knocking on doors of small businesses, informing larger customers that they engaged on a more frequent basis as part of their typical business practices). One participant mentioned improving/increasing marketing to strengthen the program.

- **Recommendation 4a.** If offering similar programs, ensure that marketing and outreach strategies continue to rely heavily on one-on-one interactions to engage customers. The dedicated support provided by Energy Managers is an important part of the customer engagement process, especially for larger and more complex projects.
- **Recommendation 4b.** If offering similar programs that target higher participation, consider increasing the marketing and outreach level, depending on customer interest generated and overall budget availability. The Kanata North program quickly became fully subscribed, making prolonged outreach unnecessary, however, future programs may benefit from additional or more diverse marketing efforts.

Finding 5: The higher incentives that tripled the standard retrofit program incentives drove higher summer peak demand savings per project. The average Kanata North Retrofit program project delivered 19.1 kW in net verified, first-year summer peak demand savings, for a 59% increase in net verified, first-year summer peak demand savings compared to the PY2022 IF Retrofit program zone 4 results. Section 4.5.1 presented this finding with additional detail.

- **Recommendation 5:** Consider offering higher measure incentives for measures that target summer peak demand savings to drive more peak demand savings in targeted geographic areas or participant groups.

Finding 6: Participants could install most energy-efficient models and equipment of interest. Most participants (nine out of twelve) could install all energy-efficient models or equipment types that interested them. When participants made recommendations for additional energy-efficient equipment or services for inclusion in the program, they most commonly cited additional lighting and solar PV (each raised by two participants). One participant suggested providing more technical support to improve the program.

- **Recommendation 6a**: If offering similar programs, consider expanding measure energy-efficient choice that include equipment of interest to customers (e.g., additional lighting, solar PV).
- **Recommendation 6b:** If offering similar programs, include additional technical support to eligible customers.

Finding 7: Opportunities remain to encourage customer participation in additional Save on Energy programs. Less than one-half of participants (five) participated in Save on Energy programs during the same year that they completed their project through the Kanata North Retrofit Program. Most of these participants (three) participated in additional programs before completing their Kanata North Retrofit project; two participants did not know when they participated in another program.

- **Recommendation 7:** If offering similar programs, train EMs, POs, and Sales Support Agents on the Save on Energy Programs and the best ways to promote them to customers.

Finding 8. Some customers expressed interest in receiving guidance and financial support to further electrify their facilities. Nearly one-half of participants (five) said their company planned to complete electrification projects in the next six months to three years. When asked what type of assistance their organization would find helpful in completing these electrification projects; three participants requested more technical support; and two participants preferred higher incentives.

- **Recommendation 8a:** Encourage the EM, PO, and Sales Support Agent to inquire about companies' intentions to electrify and promote electric measures more readily.
- **Recommendation 8b:** Train the EM, PO, and Sales Support Agent on cost-benefit analyses of electrification; so, they can more fully explain the benefits of electric energy-efficiency equipment upgrades to customers.

Finding 9. The Custom project track contributed a greater percentage of net verified, first-year demand savings in comparison to the PY2022 IF Retrofit program zone 4 results. The Custom track accounted for slightly over 80% of total program, net verified, first-year demand saving. During PY2022, Custom track projects in the IF Retrofit program's zone 4 contributed a lower amount, 62% of total program, net verified, first-year demand savings.

- **Recommendation 9:** Custom track measures can be more difficult to identify and develop than Prescriptive track measures. Consider replicating the Kanata North Retrofit program's targeted outreach strategy to other programs, thus increasing participation in desired subsectors with the greatest technical potential for peak demand reduction. Offering these additional resources can help overcome participation barriers such as project identification, business plan development, application submittals, and project implementation.

Finding 10. The Kanata North Retrofit program maintained PAC cost-effectiveness while providing participants with higher incentives and dedicated project support. The program achieved a 2.17 PAC ratio while still offering participants incentives up to $2400/kW and

300% of the standard retrofit program. Detailed cost-effectiveness results were provided in section 5.

- **Recommendation 10:** When designing or updating other IESO CDM programs, consider providing higher-than-historical incentive levels to increase program participation. The Kanata North Retrofit program's PAC cost-effectiveness results demonstrate that PAC cost-effectiveness can still be maintained, even at higher incentive levels.

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 representing 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 broad range of measures incentivized through the Kanata North Retrofit Program, several variables are considered when defining a unique project, and include:

- Application identification (ID)
- Track (prescriptive/custom)
- Measure type (lighting/non-lighting)

As a result, a number of IESO-defined projects were split into various evaluation projects, often due to measure types within the same application. This sorting process resulted in a greater count of evaluation projects, thus exceeding the count of projects reported by the IESO.

A.3 Project Audits

Subsequent to the sampling process, project audits representing the entire program population were completed. Sampled projects received Level 1 audits, consisting of desk reviews of project documentation 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 Retrofit program often includes Level 2 audits with on-site visits and metering to estimate equipment hours of use and operational load. A subset of sampled projects received Level 2 audits, where a Resource Innovations engineer visited the facility to confirm equipment installation, gathered metering/trend data, and interviewed participants to confirm key details of the project, operating patterns, and schedules.

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 the sampled projects, the verified savings are compared to the reported savings to define the sample realization rate. This realization rate is then applied to all projects' gross reported savings in the program population to estimate the verified savings. Equation 2 displays the formula for calculating the program realization rate.

Equation 2: Realization Rate

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

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 program's operations' direct energy and demand impact. 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 Kanata North Retrofit Program incentivizes installing lighting equipment with 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 savings over the retrofitted equipment's lifetime. 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 the lifetime energy savings of a measure level is presented in Equation 3.

Equation 3: Lifetime Energy Savings

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

Where:

EUL = Estimated useful life of the retrofitted equipment

Appendix B: Net-to-Gross Methodology

This appendix provides details 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, an approach used successfully in many previous evaluations. The NTG ratio presented in Equation 4 is defined as follows:

Equation 4: Net-to-gross Ratio

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

Where FR is free-ridership, and SO is spillover.

The evaluation team implemented attribution surveys to calculate FR and SO. Both FR and SO are represented as percentages of the program's total reported savings and estimated for each survey respondent. The results are aggregated to develop total FR and SO estimates and are weighted by the percentage of savings associated with each respondent's completed energy-efficiency project. Therefore, respondents with comparatively larger projects influence the total estimates more than smaller projects, allowing for results that are reflective of the responding participants and their associated impact on the program.

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

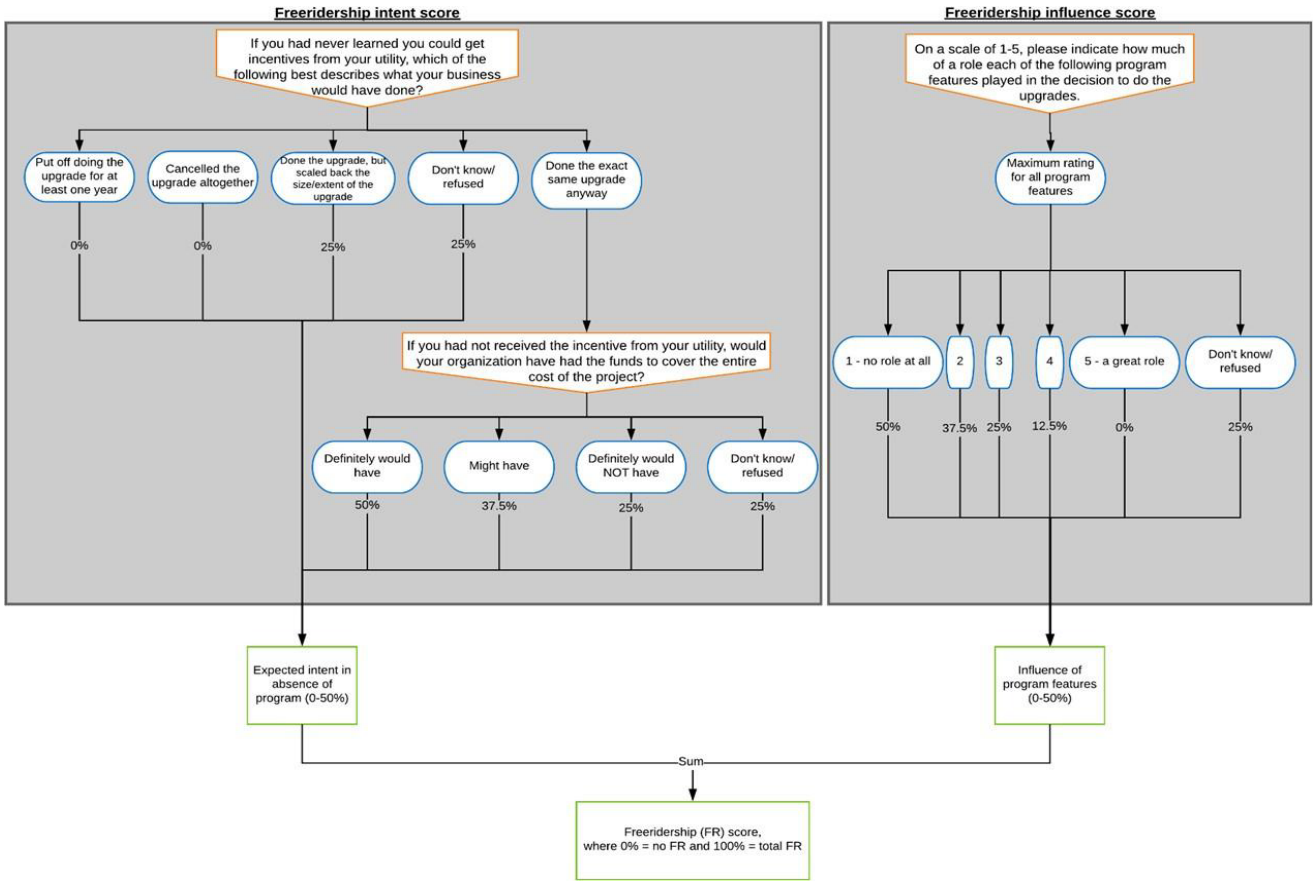
B.1 Free-ridership Methodology

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; and
- Influence of various program features, such as the incentive, program marketing and outreach, and any technical assistance received.

Each component produced scores ranging from 0 to 50. The two components were summed to produce a total FR score, ranging from 0 (not a free-rider) to 100 (complete free-rider). The total score was 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 asked participants how the evaluated project would have differed in the program's absence. The two key questions determined the intention score:

> 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-1 indicates possible intention scores a respondent could have received, depending on their responses to these two questions.

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

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

If a respondent provided an answer of 1 or 2 (would postpone or cancel the upgrade) to the first question, 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 were asked the second question before an FR intention score could be assigned.

The second question asked participants who stated that 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 received a score of 50% (associated with high FR). If the respondent answered 2 (might have had the funds), they received 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 a list form. As discussed 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%
- 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%

Influence Component

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

- Availability of the incentives
- Information or recommendations provided to you by an IESO representative (if applicable)
- The results of any audits or technical studies done through this or another program provided by the IESO (if applicable)
- Information or recommendations provided from contractors, vendors, or suppliers associated with the program
- Information from Enbridge Gas
- Information from another government entity
- Marketing materials or information provided by the IESO about the program (e.g., email, direct mail)
- Information or resources from the IESO's website
- Information or resources from social media
- Previous experience with any energy-saving program
- Others (identified by the respondent)

Table B-2 indicates the possible influence scores a respondent could receive, depending on how they rated the influence factors above. For each respondent, the program influence was set equal to the maximum influence rating 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. In that case, the program was considered to have had a great role in their decision to do the upgrade, and the influence component of FR was set to 0% (not a free-rider).

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

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

The bullet points below display the same FR Influence scoring approach in a list form. As noted, 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 a FR score ranging from 0 to 100. These scores were interpreted as % FR: a score of 0 indicated 0% FR (the participant was not at all a free-rider), a score of 100 indicated 100% FR (the participant was a complete free-rider), and a score between 0 and 100 indicated the participant was a partial free-rider.

B.2 Spillover Methodology

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

- 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 reported installing without a program incentive. The survey instrument asked about the extent of influence that earlier involvement in the program had on the decision to carry out the upgrades. Influence was reported using a scale from one (1) to five (5), where one indicated "it played no role at all" and five indicated "it played a great role." Suppose the influence score fell between 3 and 5 for a particular equipment type. In that case, the survey instrument solicited 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:

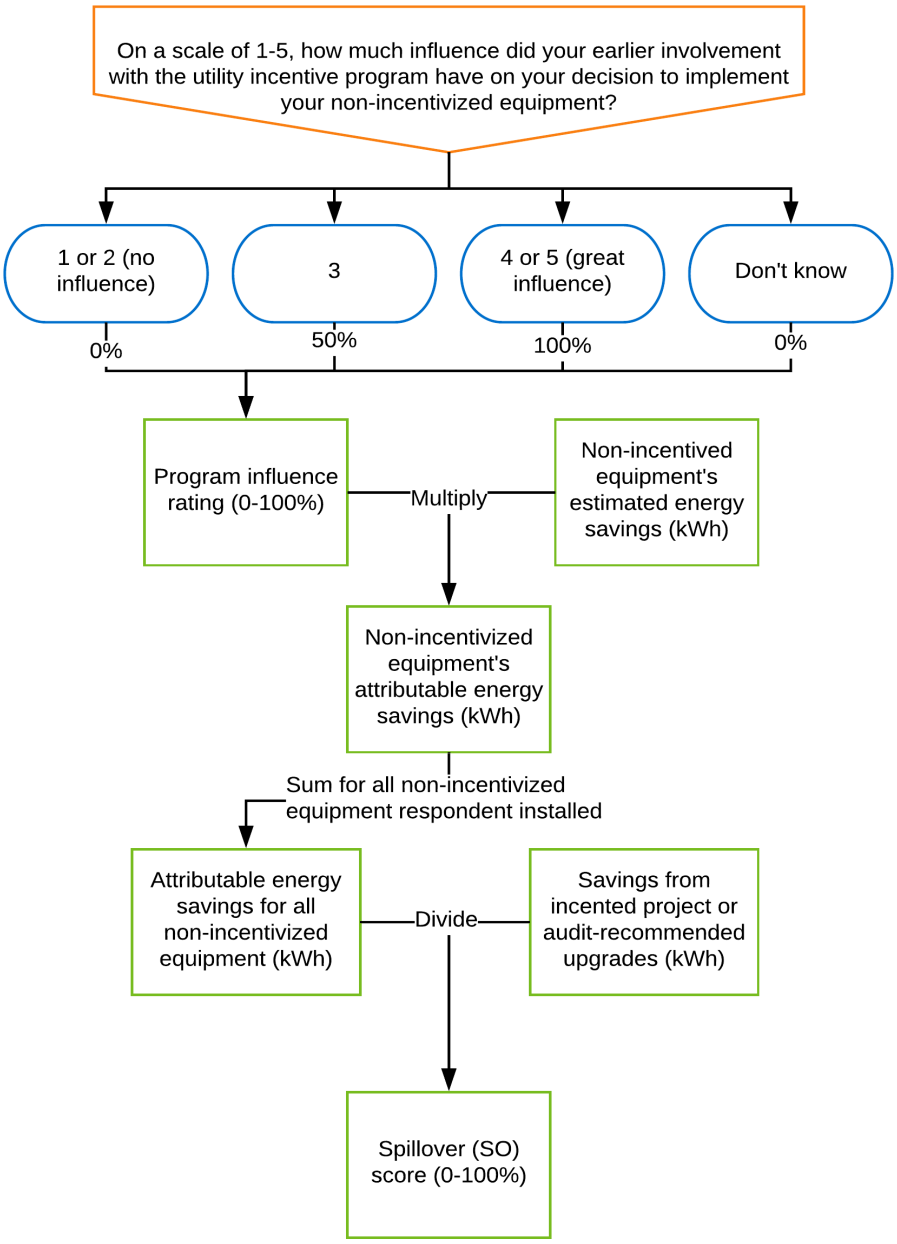
- Maximum rating of 1 or 2 (no influence) = 0%
- Maximum rating of 3 = 50%
- Maximum rating of 4 or 5 (great influence) = 100%
- Respondent does not know how much influence any factor had = 0%

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 during the program year through the particular program in question. This approach allowed for the respondent's NTG value across all projects they completed in the program year to be applied rather than solely 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 was the person primarily involved in decisions about upgrading equipment at their company. Suppose the respondent was not the appropriate contact. In that case, they were 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 web link would 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 job 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 were not included in the algorithms for calculating FR or SO, but they provided additional context. The first question ensured 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 occurred.

B.5 Net-to-Gross Survey Implementation

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

For each phone survey, 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 respondents to forward the survey web link to the appropriate contact to fill 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 3.2.

C.1 Research Question Development

Table C-1 provides a list of the key research questions and the data sources used to investigate each question. These research questions were developed at the beginning of the PY2022 evaluation period in January and February of 2023. They were written in consultation with the IESO program and the IESO EM&V staff, and they were finalized after reviewing the timing of the related survey instruments to ensure respondent fatigue would be minimized. After the research questions were finalized, they were adapted for inclusion in the interview guides and survey instruments, which were, in turn, reviewed and approved by the IESO EM&V and program staff (see Appendix C.2 for more information on the interview and survey methodology).

Table C-1: Kanata North Retrofit Program Process Evaluation Research Objectives and Data Sources

Research Questions	Document and Program Records Review	IESO & Delivery Vendor Staff Interviews	Participant Surveys
Are sufficient data being captured to effectively verify recommendations and savings?	✓		
What are the goals and objectives of the program, and how well is the program doing in terms of meeting them?		✓	
What program processes are followed by the IESO and LDC? What areas of process improvement may exist?		✓	
What program marketing and outreach occurred in support of the program? How did participants become aware of the program?		✓	✓
What are the program strengths, barriers, and areas of improvement?		✓	✓
Do the current range of program equipment/services meet customer needs? Were participants able to install all equipment models of interest to them? What suggestions exist for additional equipment/services?		✓	✓

Research Questions	Document and Program Records Review	IESO & Delivery Vendor Staff Interviews	Participant Surveys
The Custom portion of this program offered up to $1,200/kW for lighting and $2,400/kW for non-lighting measures. Compared with the existing Custom track incentives, how much additional demand savings per project were achieved (i.e., were the higher rates successful at generating more demand savings)?	✓		
What was the impact of these higher rates on cost-effectiveness?	✓		
What impact did the top-up incentive have on customer projects? How did it impact the scope, size, timing, and approval process of those projects?		✓	✓
To what extent did the top-up incentive motivate customers to participate in other IESO energy-efficiency programs?		✓	✓
To what extent did the demand profile of the measures coincide with local peaks at Kanata TS and Marchwood TS?	✓		
How did the actual measure mix compare to the targeted measures (list of Top Commercial and Industrial Demand Reducing Measures, ranked by their potential to reduce peak demand in the Ottawa transmission zone)?	✓		

C.2 In-Depth Interview and Survey Methodology

The process evaluation collected primary data from key program actors, including the LDC staff and participants (Table C-2). Data were collected using different methods, including web surveys, telephone surveys, or telephone-based IDIs, depending on the method most suitable for a particular respondent group. When collected and synthesized, these data provide a comprehensive understanding of the program.

All process evaluation data collection activities were carried out or managed by the evaluators. The evaluators developed all survey instruments, interview guides, and sample files for interviews and surveys. The IESO EM&V staff approved the survey instruments and interview guides. The data used

to develop the sample files were gathered from program records, supplied either by the IESO EM&V staff or the program delivery vendor.

Table C-2: Process Evaluation Primary Data Sources

Respondent Type	Methodology	Population	Completed	Response Rate	90% CI Error Margin
LDC Staff	Phone In-depth Interviews (IDIs)	1	1	100%	0%
Participants	Web and Phone Survey	27	12[2]	44%	N/A*

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

The following subsections provide additional details about the process evaluation methodology.

Local Distribution Company Staff Interviews

One IDI was completed with a member of the LDC staff (Table C-3). The interview's purpose was to better understand the perspective of the LDC staff related to program design and delivery.

Table C-3: LDC Staff IDI Disposition

Disposition Report	IESO Program Staff	Program Delivery Vendor Staff	Total
Completes	1	1	1
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	1

[2] The NTG evaluation included 13 more respondents (n=166) than the process evaluation (n=153) as 13 respondents did not fully answer the process evaluation survey questions.

The interview topics included program roles and responsibilities, program design and delivery, marketing and outreach, applicant representative and contractor engagement, program strengths and weaknesses, COVID-19 impacts, and suggestions for improvement.

The appropriate staff for interviews were identified in consultation with the IESO EM&V staff. The telephone IDI was conducted with the LDC staff using in-house staff (rather than a survey lab). The interview was completed on December 9, 2022, and took approximately one hour to complete.

Participant Survey

A total of 12 participants were surveyed from a sample of 27 unique contacts (Table C-4). The purpose of the survey was to better understand the participants' perspectives related to the program experience.

Table C-4: Participant Survey Disposition

Disposition Report	Web	Phone
Completes	9	3
Emails bounced	1	-
Partial Complete	4	
Soft Refusal	-	1
Hard Refusal	-	1
Non-working #	3	-
Voicemail	-	5
Agreed to Complete Online	-	2
Wrong Number	-	1
No longer with company	-	3
No Response	13	3
Total Invited to Participate	27	22

The survey topics included firmographics, how participants heard about the program, whether participants could install equipment of interest, additional equipment and services suggestions, program improvement suggestions, other program participation, incentive impact, electrification projects, FR, and SO.

The sample was developed from program records provided by the IESO EM&V staff and LDC 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 both over the phone and the web in partnership with the Resource Innovations' survey lab, using Qualtrics survey software. NMR staff worked closely with the Resource

Innovations' survey lab to test the survey's programming and perform quality checks on all data collected.

The survey implementation was conducted between March 28 and May 8, 2023. The survey took an average of 14 minutes to complete after removing outliers.[3] Weekly e-mail reminders were sent to non-responsive contacts through web survey fielding.

[3] Note that the survey was designed to allow the respondent to come back to complete it at a later time if they preferred. The average survey time was calculated with this in mind, assuming 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 Net-to-Gross and Process Evaluation Results

This appendix provides additional results in support of the NTG and process evaluations.

D.1 Additional Participant Net-to-Gross Results

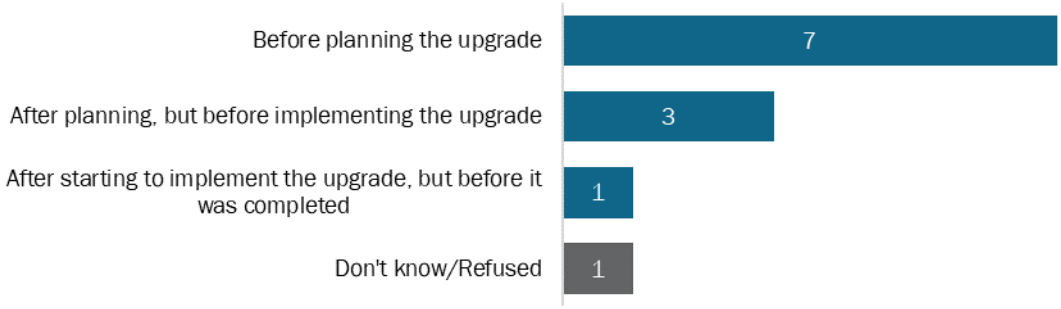
This section includes detailed FR and SO results associated with the NTGR for Retrofit participants.

Free-ridership (FR)

The extent of FR within the program was assessed by surveying Kanata North Retrofit program 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.

Seven respondents reported learning that they could receive energy-efficiency incentives through the Kanata North Retrofit Program before starting to plan their upgrades, as shown in Figure D-1. This may suggest the program influenced many of these respondents' decisions to begin the project. Three respondents learned about the program after planning started but before implementing the upgrade, and one respondent learned about the program after starting to implement the upgrade, but before it was complete. While responses to this question did not directly impact the FR score, they provided additional context for understanding the participants' decision-making processes.

Figure D-1: When Participants First Learned About the Program (n=12)*

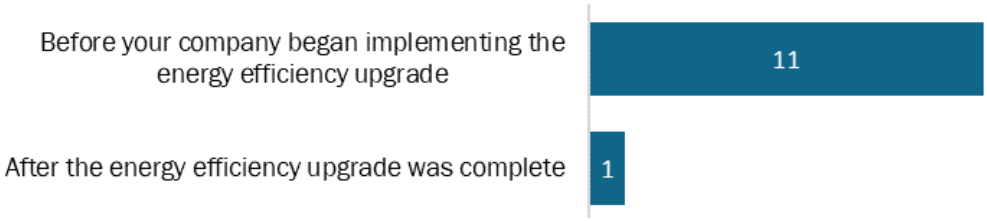


* Counts displayed rather than percentage due to small n.

The survey then asked participants about the timing of their program application in relation to the start of their energy-efficient upgrades, as shown in Figure D-2. Nearly all respondents (eleven) indicated they applied before their company began implementing the energy-efficiency upgrade, suggesting that most participants applied to the program as intended. One respondent did so after

the energy-efficiency upgrade was complete.[4] Similarly to the previous question, this question was not used to calculate the FR score, yet it provided additional context regarding participant intentions.

Figure D-2: Timing of Program Application (n=12)*



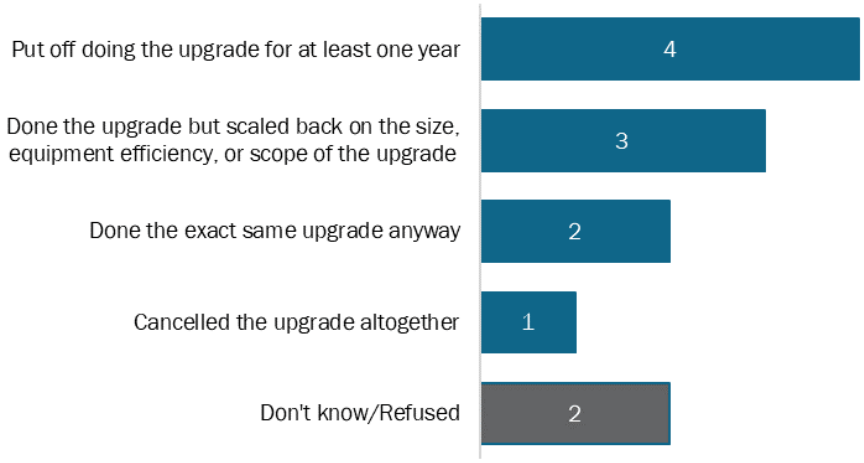
* Counts displayed rather than percentage due to small n.

Respondents were asked what they would have done in the program's absence, as shown in Figure D-3. Of these respondents, two indicated they would have done the "exact same upgrade" anyway, indicative of higher FR for these respondents. Five respondents showed no indication of FR as they stated they would have put off the upgrade for at least one year (four respondents) or cancelled their upgrade altogether (one respondent) if the program had not been available to them. Other respondents were considered partial free-riders if they reported that they would have scaled back on the size, efficiency, or scope of their project (three respondents) or if they did not know or refused to answer what they would have done in the absence of the program (two respondents). The evaluation team factored responses from this participant intent question into the FR analysis.

Respondents indicating they would have scaled back on size, equipment efficiency, or scope of the upgrade were then asked to describe the size of this reduction. All three respondents indicated they would have reduced the size, scope, or equipment efficiency by a moderate amount.

[4] This respondent said they submitted their program application "at some other time" and wrote in an open-end response. As a result, this respondent was not asked why they completed their upgrade before submitting their application.

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



* Counts displayed rather than percentage due to small n.

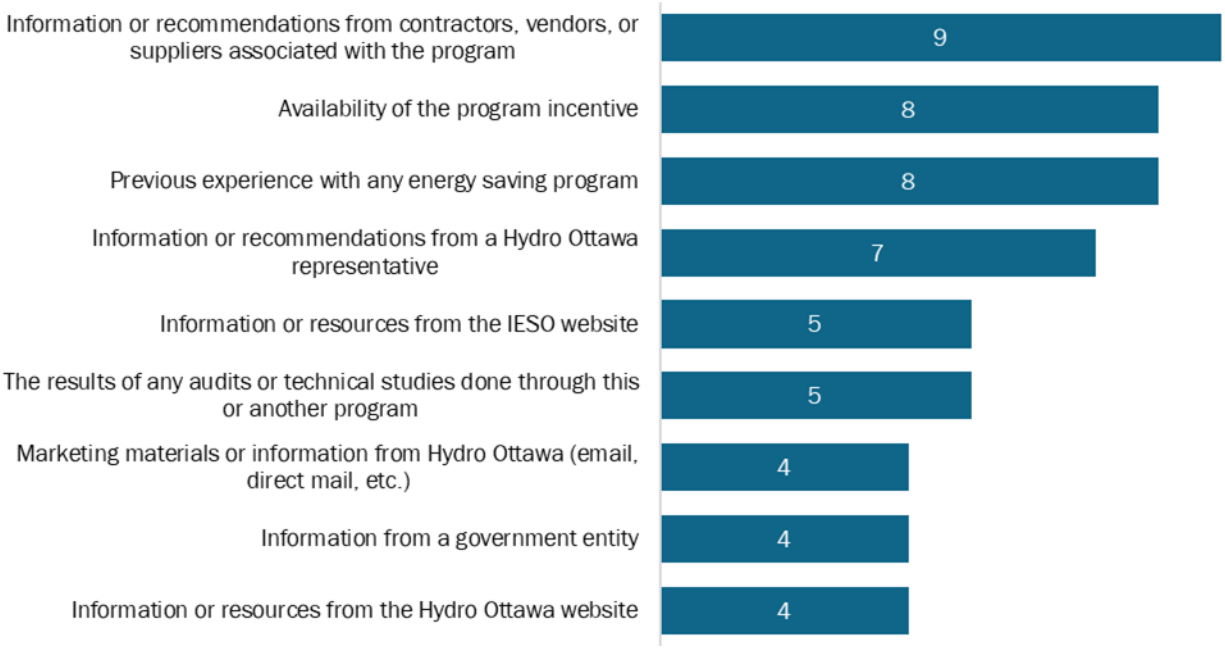
The two respondents who stated they would have done the "exact same upgrade" in the program's absence were asked whether their company would have had the funds to cover the project's entire cost without program funding. One respondent said they "definitely would have" had funds, and one respondent said they "might have" had funds to cover the project's entire cost. This feedback indicates some degree of FR, and it suggests the program may have helped some participants complete projects they might not have been able to do independently. This participant intent question was factored into the FR analysis.

Respondents were asked how influential various program features were on their decisions to install energy-efficient equipment, as shown in Figure D-4. They rated each feature's influence on a scale from one to five, where one indicates it was "not at all influential" and five indicates it was "extremely influential." The highest-rated responses were information and recommendations from contractors, vendors, or suppliers associated with the program (nine out of twelve with a rating of 4 or 5), availability of the program incentive, and previous experience with any energy-saving program (each having eight out of twelve with rating of 4 or 5). The least influential program features were marketing materials or information from Hydro Ottawa, information from a government entity, and information or resources from the Hydro Ottawa website (each having four out of twelve with a rating of 4 or 5). This question, which focused on the program's influence and prior questions about customer intentions, was used to estimate the FR score.

The findings from this question emphasize the contractor, vendor, and supplier networks' strength in driving Kanata North Retrofit Program engagement. Their interactions with customers were valuable on their own, but, more generally, they helped familiarize customers with energy-saving programs and influenced future participation beyond the Kanata North Retrofit Program.

Figure D-4: Influence of Program Features on Participation (n=12)

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

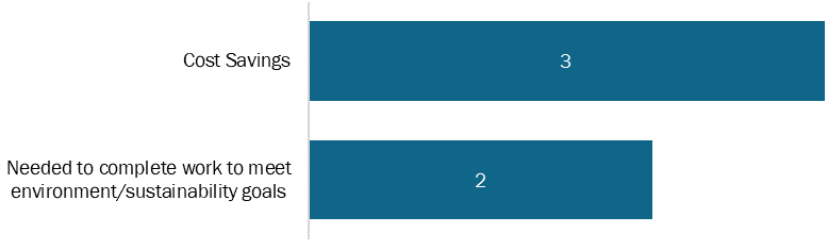


* Counts displayed rather than percentage due to small n. Does not sum to 12 due to multiple responses.

Respondents were asked whether any other factors played "a great role" in influencing their company's decision to install energy-efficient equipment upgrades, as shown in Figure D-5. The most common responses included cost savings (three respondents) and needing to complete work to meet environment/sustainability goals (two respondents).

Figure D-5: Other Influential Factors on Upgrade Decision

(Open-ended and multiple responses allowed; n=5)*



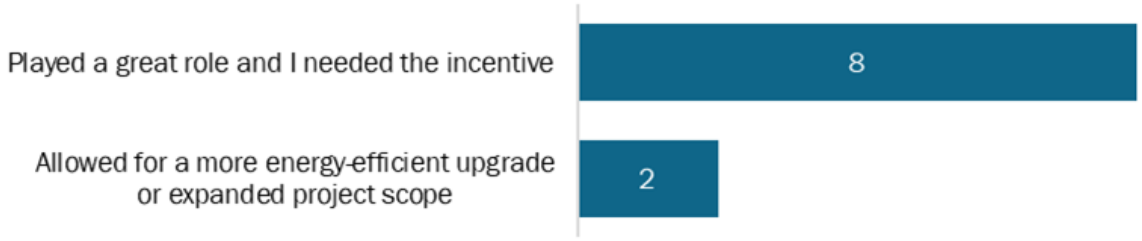
* Counts displayed rather than percentage due to small n.

The evaluation team asked respondents 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, as shown in Figure D-6. The

most common response related to the program playing a great role and needing the incentive (eight). Respondents also indicated the financial support and technical assistance allowed for a more energy-efficient upgrade or expanded project scope (two).

Figure D-6: Program Impact on Decision to Install Equipment

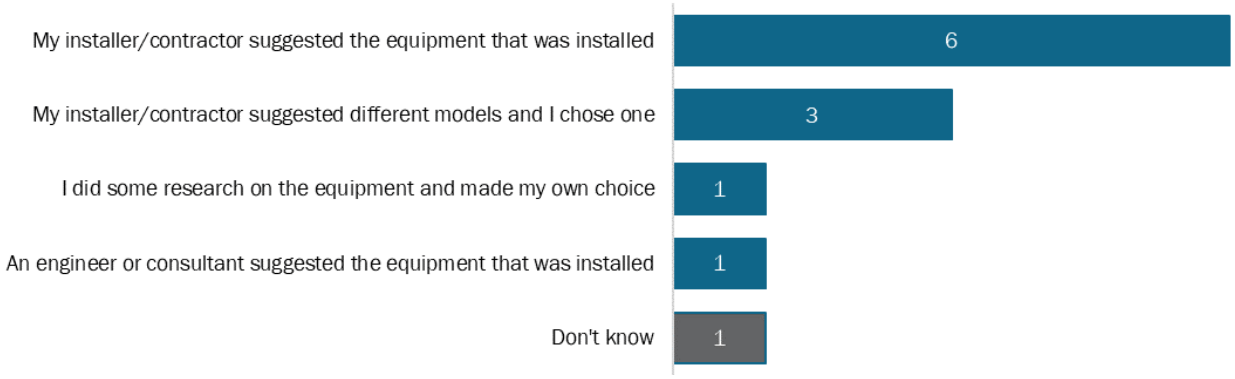
(Open-ended and multiple responses allowed; n=8)*



* Counts displayed rather than percentage due to small n. Does not sum to 8 due to multiple responses.

As shown in Figure D-7, six respondents selected equipment based on their installer's or contractor's suggestions, a number twice that of participants who chose from a shortlist of equipment models provided by their installer or contractor (three respondents). This reinforced the importance of contractors' role in helping drive customers to efficient equipment decisions.

Figure D-7: Equipment Selection Process (n=12)*



* Counts displayed rather than percentage due to small n.

Spillover (SO)

To estimate the SO rate, the evaluation team asked participants if they installed any energy-efficient equipment for which they did not receive an incentive following their participation in the Kanata North Retrofit program. Three respondents reported installing new equipment.

The team asked respondents how much influence their participation in the Kanata North Retrofit program had on their decisions to install the additional energy-efficient equipment. Participants rated

the program's influence on a scale from one to five, where one indicates the program was "not at all influential" and five indicates the program was "extremely influential." Of the three respondents, one who indicated ENERGY STAR appliances found the program influential in their decision to install additional energy-efficient equipment (average influence score of 3.0 or above), as shown in Table D-1. Those who installed an HVAC air conditioner replacement and lighting indicated that their participation in the program was not influential in their decision to install additional equipment (influence scores of 1.0).

Table D-1: Types of Upgrades Installed after Program Participation

(Open-ended and multiple responses allowed; n=3)*

Spillover Equipment	Respondents	Average Influence Score(s)
HVAC - Air conditioner replacement, above code minimum	2	1
Lighting	1	1
ENERGY STAR Appliance	1	3

*Does not sum to 3 due to multiple responses

The participant who indicated that they installed the program-influenced, non-incentivized equipment was then asked a series of follow-up questions about equipment details. This information is displayed in Table D-2 and was used within the NTG algorithm to attribute SO savings to each equipment installation. SO savings were entirely driven by the installation of six refrigerators and six dishwashers.

Table D-2: Type of ENEGY STAR Equipment Installed (n=1)

Spillover Appliance	Quantity
Refrigerator	6
Dishwasher	6

D.2 Additional Participant Process Results

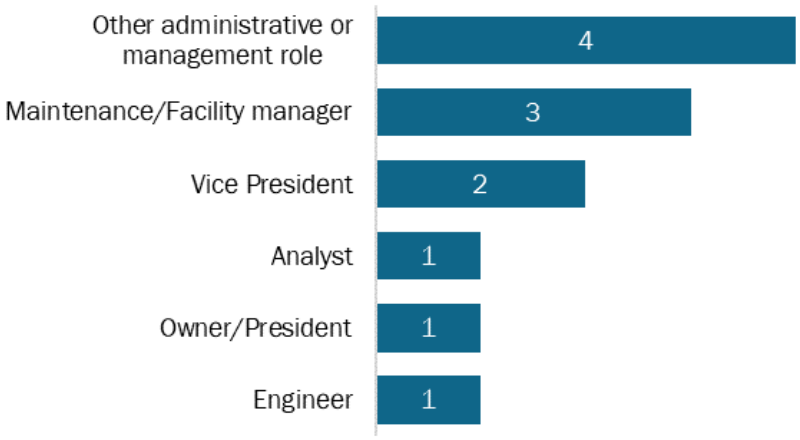
Firmographics

Respondents were asked various questions to collect information such as their job title, ownership status, responsibilities in relation to the program, and training received. Details on respondents' companies were also gathered during the survey.

As presented in Figure D-8, nearly all respondents indicated they held an administrative or managerial role. Four respondents specified such a role other than those listed in the survey. Three respondents indicated they were maintenance or facility managers and two respondents were Vice Presidents.

Figure D-8: Titles of Respondent

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



* Counts displayed rather than percentage due to small n. Does not sum to 12 due to multiple response.

Respondents specified whether they held primary or shared responsibility for the budget and/or expenditures related to the Kanata North Retrofit Program project. Six respondents had primary responsibility for the budget and/or expenditures, three respondents had shared responsibility, and three had no responsibility at all (Figure D-9). Eleven out of twelve respondents had not participated in IESO-subsidized training, and one respondent did not know.

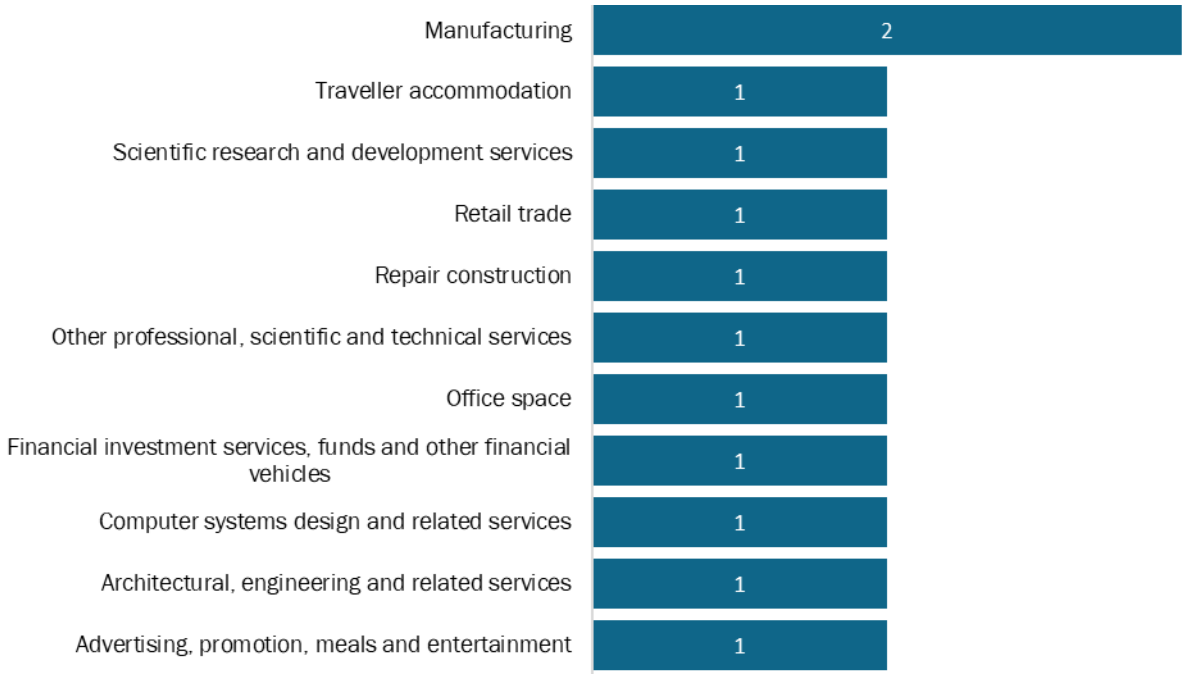
Figure D-9: Responsibility for Budget and Expenditures (n=12)*

* Counts displayed rather than percentage due to small n.

Respondent business categories varied widely, as presented in Figure D-10. Manufacturing represented the most common business category, with two respondents.

Figure D-10: Respondents' Business Category

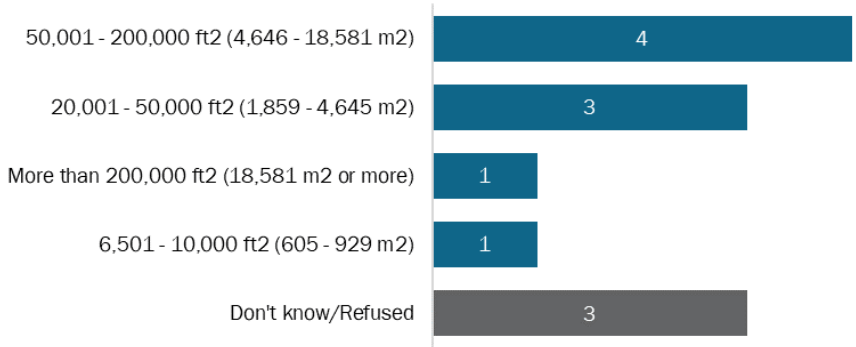
(Open-ended and multiple responses allowed; n=12)*



* Counts displayed rather than percentage due to small n.

Participants were asked to provide their facilities' total area. Most frequently, facility sizes ranged between 50,001 to 200,000 sq. ft. (four respondents) and 20,001 to 50,000 sq. ft. (three respondents, as shown in Figure D-11.

Figure D-11: Total Square Footage for All Buildings (n=12)*

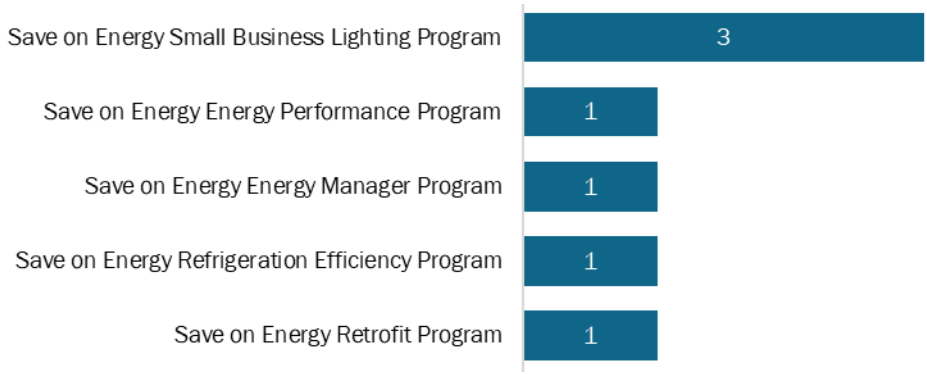


* Counts displayed rather than percentage due to small n.

Five respondents indicated that they had previously participated in other energy-efficiency program. As shown in Figure D-12, respondents most commonly had participated in the Save on Energy Small Business Lighting Program (three respondents).

Figure D-12: Participation in Additional Energy Efficiency Programs

(Open-ended and multiple responses allowed; n=5)*



* Counts displayed rather than percentage due to small n. Does not sum to 5 due to multiple responses.