

## 2017 Business Programs EM&V Key Observations and Recommendations

The EM&V key observations and recommendations were categorized according to the degree of impact they have on the implementation of the Save on Energy programs and the program results. High impact recommendations (Table 1) which can be actioned within the current Conservation First Framework (CFF) were responded to by both representatives of the Independent Electricity System Operator (IESO) and the Joint Program Operations Committee (JPOC). JPOC helps inform key activities aimed at enhancing the performance of new and existing province-wide CDM programs. Medium and low impact recommendations (Table 2) were responded only by the IESO.

**Table 1 - High Impact Recommendations**

NO.	PROGRAM	KEY OBSERVATIONS	2017 EM&V RECOMMENDATIONS	IMPACT	IESO RESPONSE	JPOC RESPONSE
1.	Retrofit Full Cost Recovery (FCR) and Pay for Performance (P4P)	<p><b>Assumed Hours of Use</b></p> <ul style="list-style-type: none"> <li>Based on evaluated projects that are part of this year's rolling sample the assumed hours of use (HOU) for omni-directional A-shape lamps may be inconsistent with actual operation. Review of 10 evaluated prescriptive lighting projects containing omni-directional A-shape lamps provided a weighted average of 6,350 hours per year of lighting operation, which is much higher than the program assumed HOU of 3,911.</li> <li>Assumed hours of use (HOU) for LED tube re-lamping may be inconsistent with actual operation. Review of 9 evaluated prescriptive lighting projects containing LED tube re-lamping provided a weighted average of 3,325 hours per year of lighting operation, which is lower than the program assumed HOU of 4,594.</li> </ul>	<ul style="list-style-type: none"> <li>Review the HOU input assumptions applied to omni-directional A-shape lamps to determine if they are consistent with lamp operation in the field.</li> <li>Review the HOU input assumptions applied to LED tube re-lamping to determine if they are consistent with lamp operation in the field.</li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO recommends reviewing the assumed hours of use for these measures, in collaboration with LDCs, through the Prescriptive Task Committee.</li> </ul>	<ul style="list-style-type: none"> <li>Members agreed the Prescriptive Task Committee should review the sample of assumed hours of use for the identified measures.</li> </ul>
2.	Small Business Lighting	<p><b>SBL Savings Assumptions</b></p> <ul style="list-style-type: none"> <li>For certain SBL measures, a range of allowable wattages is allowed. These measures typically allow LED lamps to have up to a certain maximum wattage, less than or equal to 15W, for example. The prescriptive savings calculations for these measures assume the maximum wattage allowed as the new efficiency wattage. A discrepancy exists when the verified wattage of the actual lamp is found to be less than the maximum wattage values. This discrepancy leads to the reported savings to be less than the gross verified savings.</li> </ul>	<ul style="list-style-type: none"> <li>For the 2016 SBL evaluation, a recommendation was made to consider revising SBL measure baseline assumptions to be the average wattage of the range or increase the number of SBL measure codes so that representative baseline wattage can be selected.</li> <li>In response, the IESO, the Business Working Group and the SBL Working Group were considering this recommendation and the possibility of making a more sophisticated SBL assessment tool while weighing the risks associated with increasing the complexity of application inputs.</li> <li>As an alternative, the SBL assessment tool could provide an optional field for contractors to enter the wattage of the new efficient lamp or fixture in the SBL Assessment Tool. This would only be necessary for measures that only specify a maximum wattage. The wattage value could be made to be optional in that if a</li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO is developing a new province-wide SBL Assessment Tool that will be made available to LDCs and contractors. This recommendation will be taken into consideration through the development of the new tool.</li> </ul>	<ul style="list-style-type: none"> <li>Members support the development of the province-wide SBL Assessment Tool.</li> </ul>

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			value was not entered then the default lookup value could be used.			
3.	Small Business Lighting	<p><b>Improved Baseline Photos</b></p> <ul style="list-style-type: none"> <li>In PY 2017 SBL implementers submitted photos of the pre-existing baseline fixtures and lamps. These photos are important and helpful when verifying the in-situ baseline wattages. In many cases the photos were close up images of the lamps and contained make, model and wattage information. There were a few instances where the photos did not capture enough detail of the lamps or fixtures to definitively determine the baseline wattages. Several pictures collected by contractors are of light fixtures or lamps turned on from a few feet away which does not provide useful information about the lamp wattage or lamp type.</li> </ul>	<ul style="list-style-type: none"> <li>Specify what information should be captured in the pre-retrofit and post-retrofit pictures that are collected by the SBL contractors. Specify that pictures of the replaced equipment should capture the wattage of the lamps and, if applicable, the type of ballast.</li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO, in collaboration with LDCs, will inform contractors of this observation and will provide guidance on the expected quality of photos to support the program moving forward through direct correspondence.</li> </ul>	<ul style="list-style-type: none"> <li>Members recommend leveraging the existing guidelines for baseline photos that were developed for the GreenON programs and updating them for Save on Energy programs in Q1 2019.</li> </ul>
4.	Business Refrigeration Incentive (BRI)	<p><b>Expand BRI Measure Definitions</b></p> <ul style="list-style-type: none"> <li>Measure descriptions, such as ECM fan horsepower and LED case lighting length were while captured in the program's tracking database; however, the measure savings were not reflective of differences within the broader measure type.</li> <li>In particular, the ECM fan motor measure has a very large influence on the program (77% of verified energy savings) yet only used a single deemed value for reported savings. Verified savings varied substantially per ECM fan motor measure depending on the motor's application and size.</li> </ul>	<ul style="list-style-type: none"> <li>The currently used broad measure types (e.g. ECM fan motor or LED case lighting) should be broken out into measure sub-types (e.g. 1/20 Horsepower ECM evaporator fan motor, 48 inch LED strip light) to appropriately capture unique savings estimates. By way of using more granular measure savings will allow for improved precision in savings estimates.</li> <li>It is recommended to prioritize disaggregating the single ECM fan motor measure to distinguish sub-measure type key characteristics, as these variations have a significant influence on the measure's savings. The most influential characteristics on the savings are the application of the motor (evaporator vs. condenser) and the size of the motor (Watts or HP).</li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO recommends activating Task Committee, in collaboration with LDCs, to review issues identified with the Business Refrigeration Incentive Program, specifically the granularity of the measure types.</li> </ul>	<ul style="list-style-type: none"> <li>Members will direct the BRI Task Committee to look into these findings and recommendations and put together a work plan for Q1 2019.</li> </ul>
5.	Business Refrigeration Incentive (BRI)	<p><b>Capture and Document Measure Baseline Data</b></p> <ul style="list-style-type: none"> <li>Assumed baseline types impact measure savings significantly, specifically for ECM fan motor and lighting measure types. However, baseline information was inconsistently captured in the BRI program's tracking database and project files. Some measures were listed in the program tracking database with no reference to a baseline type while other measures included a baseline description.</li> </ul>	<ul style="list-style-type: none"> <li>Standardizing a menu of measures for program implementers to select from when entering project data (such as Microsoft Excel's data validation feature) will help ensure baseline information is included in the program tracking data, as well as standardize measure names used across LDCs.</li> <li>Consider requiring equipment installers</li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO recommends activating a Task Committee, in collaboration with LDCs, to review issues identified with the Business Refrigeration Incentive Program, specifically standardizing baseline measure data</li> <li>Further, the IESO is developing a new province-wide BRI Tool that will be made available to LDCs and contractors. This</li> </ul>	<ul style="list-style-type: none"> <li>As above.</li> </ul>

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			submit proof (e.g. photos) of baseline equipment at the time it is removed from service for all equipment, and provide these files to IESO. This would ensure the baseline is accurate and consistent between reported and verified savings estimates.		recommendation will be taken into consideration through the development of the new tool.	
6.	Business Refrigeration Incentive (BRI)	<p><b>Standardize Project File Documentation</b></p> <ul style="list-style-type: none"> <li>Project file organization and available data supporting reported savings estimates was inconsistent between LDCs</li> </ul>	<ul style="list-style-type: none"> <li>Across all LDCs, standardize how project files are collected, stored, and provided to IESO. It is recommended to have one main file folder for each project, with all supporting documents for the project contained within that folder, such as work orders and photos. Similarly, standardizing file naming conventions for different file types (e.g. work orders, photos) may prove to help program staff and evaluators alike quickly navigate project files.</li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO recommends activating a Task Committee, in collaboration with LDCs, to review issues identified with the Business Refrigeration Incentive Program, specifically standardizing project data.</li> <li>Further, the IESO is developing a new province-wide BRI Tool that will be made available to LDCs and contractors. This recommendation will be taken into consideration through the development of the new tool.</li> </ul>	<ul style="list-style-type: none"> <li>As above.</li> </ul>
7.	Business Refrigeration Incentive (BRI)	<p><b>Identify Gaps in Coverage and Foster Communication between Program Delivery Partners</b></p> <ul style="list-style-type: none"> <li>The motor supplier and refrigeration technician appear to have contradictory perspectives on equipment availability. The motor supplier reported there was “no product or supply-related issues.” However, the refrigeration technician reported shortage of program qualifying ECM motors was growing into a “consistent issue.”</li> </ul>	<ul style="list-style-type: none"> <li>Clarify the program needs between the supplier and refrigeration technician and improve communication pathways to ensure adequate available supply of product. This could be made possible by creating more opportunities for program partners to discuss implementation constraints or by expanding the number of program suppliers that support the program to alleviate any bottlenecks in supply.</li> </ul>	High	<ul style="list-style-type: none"> <li>BRI was launched as a province-wide program in 2017. As the program continues to mature it is expected that the market will develop more robust supply chain networks.</li> <li>Task committee – to keep an eye and look at engaging</li> </ul>	<ul style="list-style-type: none"> <li>As above.</li> </ul>
8.	Audit Funding	<p><b>Promote Incentives in Audit Reports</b></p> <ul style="list-style-type: none"> <li>Of the 36 total measures implemented, it was estimated that 16 (44%) were likely eligible for incentives in 2017; this figure was 38% in 2016. It was not determined if the participants were aware these recommended measures would likely qualify for incentives. In order to further increase the number of measures implemented as a result of the Audit Funding program the audit reports should clearly state which recommended measures may qualify for incentives through other CDM programs.</li> </ul>	<ul style="list-style-type: none"> <li>Provide clear information on all available incentives for measures that are recommended in audit reports including contact information and instructions on how to apply.</li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO, in collaboration with LDCs, will investigate updating the minimum energy audit report requirements through the Program Rules, as a result of this recommendation.</li> </ul>	<ul style="list-style-type: none"> <li>Members agreed the updated minimum energy audit report requirements and the updated web site containing newsletters will be included in the Audit Funding webinar.</li> </ul>
9.	Audit Funding	<p><b>Make Resources Available for Customers and Auditors that Clarify Structure and Program Benefits</b></p> <ul style="list-style-type: none"> <li>According to some auditors, customers are unclear</li> </ul>	<ul style="list-style-type: none"> <li>Materials need to be available which would clarify incentives, timelines and deadlines, financing options, and case study and benchmark data that will help</li> </ul>	High	<ul style="list-style-type: none"> <li>Recently, the IESO updated the Save on Energy website and many of these recommendations have been addressed, as a result. The IESO will identify further</li> </ul>	<ul style="list-style-type: none"> <li>As above.</li> </ul>

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		<p>regarding the structure, process, and deadlines of the program, and can be skeptical about the financial benefits of efficiency upgrades discovered during the audit process.</p>	<p>recruit customers into the program, but will also help those already enrolled successfully complete the program and continue on with retrofits and installations of recommended equipment. These resources should be available, and easily found, on the program website.</p>		<p>opportunities to develop materials to support auditors delivering the program.</p>	
10.	Cross-cutting	<p><b>Continue to Foster Understanding of NTG and Related Best Practices</b></p> <ul style="list-style-type: none"> <li>Both LDC staff and IESO staff provided constructive suggestions regarding educational opportunities surrounding NTG topics and best practices used to help improve NTG scores. Common suggestions included 1) more outreach regarding the NTG methodology over the course of the year (not just during the time of the evaluation), and 2) considering ways in which LDCs could be educated on this topic in a more interactive and familiar way, such as during road shows or as part of workshop-style sessions. Less than half of surveyed LDC staff (43%) indicated they have a very good understanding of the methods IESO program evaluators use to calculate NTG scores. Nearly one-quarter (20%) have a moderate understanding of these methods, and nearly one-third (30%) do not understand how the IESO program evaluators calculate NTG scores. However, the majority of LDCs (67%) indicated that they take proactive steps to help improve their NTG score such as educating customers (30%) and closely reviewing applications (20%). IESO staff suggested that more outreach over the course of the evaluation year regarding the NTG methodology used (not just during the time of the evaluation) could be helpful, particularly to smaller LDCs who may be more time and resource constrained. Additionally, IESO staff suggested considering ways in which LDCs could be educated on this topic in a more interactive and familiar way, such as during road shows or as part of workshop-style sessions.</li> </ul>	<ul style="list-style-type: none"> <li>Although the free-ridership results for most of the Business Programs were mostly positive, it will continue to be important to: <ul style="list-style-type: none"> <li>➤ For program marketing and outreach to target customers who would not make upgrades without the support of the program;</li> <li>➤ As part of the program application review process to effectively screen for eligible customers who have not begun work; and,</li> <li>➤ For program delivery partners to more readily identify projects that would not be completed without the support of the program; and</li> <li>➤ Continue to provide educational opportunities or materials to LDC staff and associated program delivery partners regarding NTG and related best practices as these educational opportunities or materials may be helpful when working to improve NTG scores.</li> </ul> </li> </ul>	High	<ul style="list-style-type: none"> <li>The IESO will continue to provide resources and identify educational opportunities to develop the understanding of the program evaluation process across the broader LDC community.</li> <li>It will continue to be the responsibility of LDCs to screen for eligible customers and free ridership. The IESO will assume these responsibilities in the LDC service territories where it is delivering the program.</li> </ul>	<ul style="list-style-type: none"> <li>Members agreed that LDC community could benefit from a refresher webinar on the programs' evaluation process.</li> </ul>

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Table 2 - Medium and Low Impact Recommendations

NO.	PROGRAM	KEY OBSERVATIONS	2017 EM&V RECOMMENDATIONS	IMPACT	IESO RESPONSE
1.	Retrofit FCR and P4P	<p><b>Consider Additional Measures as Suggested by Retrofit Contractors</b></p> <ul style="list-style-type: none"> <li>Contractor suggestions for additional prescriptive track measures to incentivize through the Retrofit Program included other types of controls, sensors, energy management systems, a broader range of LED lamps and fixtures (T5s, luminaires), and building envelope upgrades.</li> </ul>	<ul style="list-style-type: none"> <li>Since most of these measures can be included in the Retrofit Program through the custom track, this recommendation can help begin a conversation with LDCs, contractors, and participants about the feasibility of including these types of equipment in the prescriptive track.</li> <li>This can be a researchable question for future evaluation cycles and take into account program rules, market demand, savings potential, and cost-effectiveness to determine the best measures to add to the program.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>The IESO, in collaboration with LDCs, will investigate opportunities to include additional prescriptive track measures through the Prescriptive Measures Task Committee.</li> </ul>
2.	Retrofit FCR and P4P	<p><b>Identify Effective Ways to Engage Participants</b></p> <ul style="list-style-type: none"> <li>In 2017, a large majority of participants were satisfied with the program overall (82%) and were very likely to recommend it to others (91%). These results were very similar to the 2016 results for overall satisfaction (83%) and likelihood to recommend (91%). In 2017, participants were least satisfied with the time it took to receive the incentive (63%) and the dollar amount of the incentive (68%); in 2016, participants were least satisfied with interactions with IESO (54%) and technical studies (48%). The most frequently mentioned barrier to making future energy-efficient upgrades was costs outweighing the benefits from energy savings (31%).</li> <li>In both 2016 and 2017, 95% of participants mentioned saving energy and lowering energy bills as the primary motivator for their participation. This was followed by increasing comfort and/or productivity at their facilities (59% in 2017 and 60% in 2016) and being associated with “green” or “sustainable” actions (53% in 2017 and 54% in 2016). The majority of 2017 active nonparticipants also cited saving energy (86%) and keeping energy bills low (82%) as important motivators in addition to mentioning the importance of upgrading to more efficient equipment (87%).</li> </ul>	<ul style="list-style-type: none"> <li>Consider ways of fast tracking customer incentive payments.</li> <li>Continue to focus marketing and outreach strategies on the primary motivations and barriers identified by customers. Clearly describing the energy and monetary savings opportunities is critical, as is helping customers identify deeper energy savings to justify the work. Making the connection between equipment upgrades and sustainability will resonate with many customers. For customers who may be less concerned about energy or monetary savings, communicating the value of non-energy benefits may be a more effective engagement strategy.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>The IESO is implementing a new Retrofit application solution which is expected to improve the customer experience with the program.</li> <li>Save on Energy marketing will continue to focus on the primary motivations to implement energy efficiency projects and it is expected that greater emphasis will be placed on communicating non-energy benefits.</li> </ul>
3.	Small Business Lighting	<p><b>SBL Assessment Tool (Hours of Operation)</b></p> <ul style="list-style-type: none"> <li>The new SBL Assessment Tool for the updated program is an improvement from the previous version. It collects important parameters necessary to calculate energy and demand savings and is relatively easy to use for contractors and implementers. The evaluator understands that it is important the Assessment tool not be overly complicated but discrepancies between the operating schedules reported on the application and those verified in the field still contribute significantly to the realization rates being less than 100%.</li> </ul>	<ul style="list-style-type: none"> <li>For the 2016 SBL evaluation, a recommendation was made to allow SBL participants to enter multiple lighting schedules. In response, the IESO, the Business Working Group and the SBL Working Group were considering allowing for input of hours of operation at the measure level.</li> <li>The evaluator recommends that clear instructions be provided to SBL implementers and participants on what hours of operation should be entered in the SBL Assessment Tool. It should be clarified that the schedule entered in the Hours of Operation tab should be the hour the new efficient lamps are expected to operate and not the hours of operation of the business. Many times the hours the business is open to the public are entered into</li> </ul>	Medium	<ul style="list-style-type: none"> <li>The IESO is developing a new province-wide SBL Assessment Tool that will be made available to LDCs and contractors. This recommendation will be taken into consideration through the development of the new tool.</li> </ul>

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			<p>the SBL Assessment Tool when in fact the lights are turned on before and after the business is open to the public. Another option is to clarify in the Assessment Tool instructions and in contractor trainings that in cases where multiple schedules exist, the schedule entered should be for the lights that are expected to generate most of the energy savings.</p>		
4.	Small Business Lighting	<p><b>Continue to Monitor Delivery Partner Satisfaction</b></p> <ul style="list-style-type: none"> <li>The evaluator is aware that the SBL Program is in the process of a re-design that will include several changes related to the measure list as well as dollar cost caps. The re-design is timely and justified as less than two-fifths (37%) of the surveyed SBL assessors and installers were satisfied with the 2017 program. These results contrast sharply with assessor and installer satisfaction in 2016 (73%). It is worth noting that the program was just ramping up in 2016, and therefore 2016 respondents may not have had a long enough experience with the program in comparison to 2017 survey timing.</li> <li>The lowest satisfaction levels in 2017 were associated with program marketing and outreach (33%), dollar cost caps associated with each upgrade (26%), number and types of equipment incentivized through the program (23%), and dollar amount of the incentives (22%). In 2016, installers and assessors were most dissatisfied with dollar amount of the incentives and number and types of equipment incentivized through the program (55% satisfied each).</li> <li>In 2017, installers and assessors who were dissatisfied with dollar cost caps associated with each upgrade (nine of 27 respondents) reported that certain bulb conversions were low due to low incentives (three respondents) and that cost caps associated with each upgrade were restricting the ability to upgrade an entire facility (three respondents). Installers and assessors who were dissatisfied with overall program cost caps of \$2,000 (nine of 27 respondents) most commonly mentioned that increasing overall cost cap would allow customers to take full advantage of the program (four respondents). Over four-fifths (81%) of installers and assessors said more program-qualifying lighting equipment would have been installed if the overall cost cap had not existed.</li> </ul>	<ul style="list-style-type: none"> <li>The evaluation team recommends that the program continue to closely monitor the effectiveness of the program changes through fostering dialogue with program delivery partners, whether it be through in-person events, quarterly check-in calls, or one-on-one communications. They key observations have revealed the following areas of delivery partner dissatisfaction: <ul style="list-style-type: none"> <li>Program marketing and outreach</li> <li>Dollar cost caps associated with upgrades</li> <li>Number and types of incentivized equipment</li> <li>Dollar amount of the incentives</li> <li>SBL program overall</li> <li>Understanding what areas of delivery partner dissatisfaction remain as the delivery partners begin interacting with the redesigned program will help ensure that the program runs smoothly</li> </ul> </li> </ul>	Low	<ul style="list-style-type: none"> <li>It is expected that the SBL Program changes implemented in August 2018 will result in improved delivery partner satisfaction. It will continue to be the responsibility of LDCs to have regular touch points with their delivery partners and to monitor their satisfaction. The IESO will assume these responsibilities in the LDC service territories where it is delivering the program.</li> </ul>
5.	Small Business Lighting	<p><b>Continue to Monitor Participant Satisfaction</b></p> <ul style="list-style-type: none"> <li>In both 2016 and 2017, the majority of SBL participants were satisfied with the overall program (83% in both years). In both 2016 and 2017, participants were most satisfied with the work done by the assessor and/or installer (89% and 84%, respectively). In both 2016 and 2017, participants were also very satisfied with the performance of the efficient equipment (85% in both years).</li> <li>In 2016, participants highly rated their satisfaction with the LDC representatives (87%) which contrasts with lower satisfaction ratings</li> </ul>	<ul style="list-style-type: none"> <li>The evaluation team recommends that the program continue to closely monitor the effectiveness of the program the program changes through engaging with customers at all phases of the participation process. Understanding what areas of participant dissatisfaction and barriers to entry remain will help ensure that the program runs smoothly.</li> </ul>	Low	<ul style="list-style-type: none"> <li>It is expected that the SBL Program changes implemented in August, 2018 will result in improved participant satisfaction. It will continue to be the responsibility of LDCs to have regular touch points with program participants and to monitor their satisfaction. The IESO will assume these responsibilities in the LDC service territories where it is delivering the program.</li> </ul>

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		<p>achieved in 2017 (69%). Results between years are statistically significant.</p> <ul style="list-style-type: none"> <li>The most common suggestions for improvement in 2017 were to improve the quality of the upgrades (mentioned by 22% of participants), increase the number of equipment types covered (20%), and improve performance of the dimmable LEDs (14%). The most common improvement suggestions in 2016 were to speed up the overall process and to improve customer service (mentioned by 3 respondents each).</li> <li>More than four-fifths of 2017 participants (85%) agreed that program materials provided by their LDC were sufficient, while only about two-thirds (68%) agreed that the program application was easy to complete.</li> </ul>			
6.	Business Refrigeration Incentive (BRI)	<p><b>Further Educate Customers on Energy Savings Potential of Program Upgrades</b></p> <ul style="list-style-type: none"> <li>Most surveyed participants (79%) were very satisfied with the program overall, and 84% would likely recommend the program to others. Participants were less satisfied with the energy savings achieved by the equipment upgrade (48% satisfied). Program delivery agents indicated the program needs to reach past the “low hanging fruit” to the harder-to-reach customers. A lack of proper education on potential savings and the challenges with providing long-term savings were the main barriers mentioned by program delivery agents, the refrigeration technician, and the motor supplier.</li> <li>The refrigeration technician and motor supplier stressed the importance of ensuring that the program delivery agents are able to clearly describe the savings and payback periods of equipment to customers when conducting audits to ensure the acceptance of new technologies and products (such as ECM motors). Given that the program delivery agents are tasked with assessing and then deciding the energy-saving opportunities to recommend to the customer, it is critical that they have the education, guidance, and resources necessary to communicate the benefits of the program to the customer.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that program delivery agents are well-versed in articulating the merits of the program to customers as well as the savings opportunities and payback periods when conducting audits. Program staff can coordinate with program delivery agents to ensure that their staff who perform the audits are well trained in how communicate with customers.</li> <li>Customer education and outreach opportunities should be explored to provide information on the energy savings potential of program-incentivized measures. The program could consider direct measurement of energy savings to develop additional case studies that could be used as “testimonials” of verified energy savings. Program materials and market outreach should also be refined to clearly describe the savings opportunities and payback periods to customers.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>The IESO recommends activating a Task Committee, in collaboration with LDCs, to review issues identified with the Business Refrigeration Incentive Program. This committee can work in collaboration with the Marketing Campaigns committee and the IESO to develop additional communication materials for the program.</li> </ul>
7.	Business Refrigeration Incentive (BRI)	<p><b>Improve Customer Experience and Further Streamline Program</b></p> <ul style="list-style-type: none"> <li>Ten of 66 surveyed participants said that they were not satisfied with the level of the incentive. Three participants indicated frustrations with the refrigeration technician and/or equipment options offered by the technician, and two participants suggested expanding the equipment options covered by the program.</li> <li>One program delivery agent suggested streamlining the assessment and installation process by implementing a more “turn-key” type service, whereby the program delivery agents could be made responsible for all lead generation (rather than the LDC), and, in some instances, installations. Lead generation is done primarily by the LDC; however, delivery agents suggest more efficiencies may be experienced if they were primarily responsible for generating leads. Additionally, under the current delivery model, only the refrigeration technician can perform</li> </ul>	<ul style="list-style-type: none"> <li>Consider reviewing incentive types and levels as well as equipment options for alignment with customer needs, if feasible.</li> <li>Consider implementing and promoting a BRI refrigeration technician network as a means of recommending quality technicians to program participants. This may become increasingly important as more LDCs begin to offer the BRI Program in future program years.</li> <li>Improve customer experience by further streamlining the process. This could involve implementing more of a “turn-key” service where possible to simplify the process for participants. Examples of how this could be implemented include:</li> </ul>	Medium	<ul style="list-style-type: none"> <li>The IESO recommends activating a Task Committee, in collaboration with LDCs, to review issues identified with the Business Refrigeration Incentive Program, specifically how to streamline the program and improve the customer experience.</li> </ul>

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		installations; special training is needed to install most program-supported equipment. However, there may be an opportunity for program delivery agents to install at least some of the equipment that does not require special training during the initial audit. This could, in turn, minimize the number of visits experienced by some customers, minimizing the amount of time they need to dedicate to participating in the program.	<ul style="list-style-type: none"> <li>Allow program delivery agents the option to be primarily responsible for lead generation.</li> <li>Allow program delivery agents to install equipment during initial audit that does not require special certification to install.</li> </ul>		
8.	Audit Funding	<p><b>Build in Additional Flexibility to Audit Applications, Report Requirements, and Program Incentive Structure</b></p> <ul style="list-style-type: none"> <li>Both auditors and participants reported high levels of satisfaction with the program. The review process, however, was a common focus of critique. For the most part, auditors were responsible for submitting program paperwork but there were some participants who submitted applications and audit invoices for incentive reimbursement. Across both groups, participants cited a complicated and rigid application and reporting structure. Specifically, they described: the 10% discrepancy limit for reimbursement of savings between pre and post audit savings reports, the inability to include supplementary information with required reports, highly technical report requirements and professional jargon that are not understood by participants, and report reviews being done by non-engineers who may request unnecessary information from auditors as problems that can cause significant reporting delays. Some auditors thought that this increased report turnaround time, and the general complexity of the application and reporting processes, slows down projects significantly or prevents participation altogether.</li> </ul>	<ul style="list-style-type: none"> <li>Re-visit the program rules and documents for application and reporting, paying special attention to the aforementioned auditor and participant concerns.</li> </ul>	Medium	<ul style="list-style-type: none"> <li>The IESO, in collaboration with LDCs, will investigate updating the minimum energy audit report requirements through the Program Rules, as a result of this recommendation.</li> </ul>
9.	High Performance New Construction (HPNC)	<p><b>Lighting Power Density Baseline (LPD)</b></p> <ul style="list-style-type: none"> <li>The 2015 National Energy Code of Canada for Buildings provides LPD allowances per building and space type. An LPD allowance specifies the maximum amount of wattage of lighting a particular building can utilize per square foot. Code-based LPD values are set based on how much light (in lumens) is needed at the work-space level for different building types (e.g., for safety reasons a manufacturing facility is allotted a greater LPD allowance than an office).</li> <li>In order to calculate savings for a measure where the baseline is theoretical (as is the case in new construction), program administrators and evaluators are forced to make educated estimates as to what equipment the customer might have installed.</li> <li>Reported lighting savings within the HPNC Program are currently calculated as retrofit measures where the consumption of the installed piece of equipment is compared to a hypothetical baseline fixture of an alternate type and wattage in a one-for-one replacement strategy.</li> <li>Lighting measures had an overall energy realization rate of 125% and a demand realization rate of 124% across the 41 projects within the sample. The main reason the lighting realization rates are above 100% is</li> </ul>	<ul style="list-style-type: none"> <li>Switch to a Lighting Power Density methodology when calculating new construction lighting measures.</li> <li>In the case of new construction the baseline equipment should at least be assumed to be code-compliant as a non-compliant piece of equipment is not a realistic alternative. As the code specifies lighting compliance in terms of LPD calculations, it follows that energy savings should also be calculated via this method. Nexant recommends IESO to update the prescriptive worksheet assumptions and make the allowable lighting baseline for engineered worksheets be based on LDP requirements of the code for the space or building type.</li> </ul>	Low	<ul style="list-style-type: none"> <li>Given that the HPNC Program underwent significant changes in 2017, and given the evaluator's observation is that the program assumptions are conservative, the IESO recommends taking no action until other high impact changes need to be made to the program.</li> </ul>



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		the difference in LPD-based calculations versus retrofit-style calculations.			
10.	High Performance New Construction (HPNC)	<p><b>Support Builders, Developers, Architects, and Engineers in Delivering the Program to Customers</b></p> <ul style="list-style-type: none"> <li>In 2017, builders and developers were moderately satisfied with the program as were architects and engineers. In 2016, builders and developers indicated somewhat higher satisfaction. However, given the small number of respondents (6 in 2016 and 5 in 2017), it is not possible to determine if this difference is statistically significant.</li> <li>Builders reported that most of their 2017 sales were from projects that did not participate in the HPNC program. One builder reported that 35% of 2017 sales went through the HPNC Program, while no other builder reported more than 5% of their total sales going through the program. Given that most of the builders' sales fell outside the program, and given that in 2016, 5 out of 6 builders made at least half of their sales through the program, there exists an opportunity to better inform builders about how to upsell the program to their customers.</li> <li>Many 2017 participants learned about the program through builders, developers, or contractors. However, from the evaluation team's interviews with builders, developers, architects, and engineers, it appears that, these program partners are largely unaware of the influence that their recommendations had on customers. This suggests that there may exist an opportunity for program staff to communicate with builders, developers, architects, and engineers the important role they can have when it comes to informing customers about the program's energy-efficiency opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>Provide training and education to a wider pool of builders, developers, architects, and engineers to ensure they 1) are aware of the program, 2) are aware of the important role they can play when it comes to informing customers of the program's energy-efficiency program opportunities, and 3) effective sales tactics that demonstrate the benefits of the program to convert more of their customers into program participants.</li> </ul>	Low	<ul style="list-style-type: none"> <li>Given the 2020 time constraint of the Conservation First Framework and the average lifecycle of HPNC projects, it may be challenging to increase program participation at this time. However, the IESO will continue to work with LDCs to improve the quality of marketing materials in resources through the Marketing Campaigns Task Committee.</li> </ul>
11.	High Performance New Construction (HPNC)	<p><b>Identify Effective Ways to Engage Participants</b></p> <ul style="list-style-type: none"> <li>In 2017, participants were very satisfied with the HPNC Program (94%). This is a statistically significant improvement from 2016 where only about one-half (53%) were satisfied or very satisfied with the program.</li> <li>There is some room to improve the clarity of program materials and the program application. Participants in 2017 gave moderate satisfaction ratings of between 3.1 and 3.4 on a five-point scale to both these elements. Participants recommended making both the materials and application more user-friendly.</li> <li>In both 2016 and 2017, almost all the surveyed participants stated that they were motivated to participate in the program due to a desire to save energy or lower energy bills (95% in 2016; 94% in 2017). Increased comfort and/or productivity were the next greatest motivator for participation in 2017, reported by 72% of participants; this factor was less of an important motivator in 2016, mentioned by only 47% of participants.</li> <li>2017 participants stated it could be difficult to make future energy</li> </ul>	<ul style="list-style-type: none"> <li>Improve on the clarity of the program materials and the program application process by making them more user friendly for customers.</li> <li>Focus marketing and outreach strategies on the primary motivations and barriers identified by customers. Clearly describing the energy and monetary savings opportunities is critical, as is helping customers identify deeper energy savings to help justify the work. Making the connection between efficient equipment and sustainability will speak to many customers. For customers who may be less concerned about energy or monetary savings, communicating the value of non-energy benefits may be a more effective engagement strategy.</li> </ul>	Low	<ul style="list-style-type: none"> <li>The IESO will continue to work with LDCs to improve the quality of marketing materials in resources through the Marketing Campaigns Task Committee.</li> </ul>

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		<p>efficient upgrades due to a lack of time to research equipment upgrades and the benefits not outweighing the costs (six respondents each). Other challenges included the electric costs not being a concern, not being able to afford the upgrades, and being unaware of where to get the necessary help (5 respondents each).</p> <ul style="list-style-type: none"> <li>Architects and engineers reported that they find building owners to be most driven by the payback period and the energy savings available when they choose to complete a project up to the HPNC program standards. They considered the amount and complexity of paperwork the biggest challenge facing potential applicants.</li> </ul>			
12.	Existing Building Commissioning (EBCx)	<p><b>Decrease Project Completion Time</b></p> <ul style="list-style-type: none"> <li>Overall, the participants, as they did in 2016, and the commissioning agent were satisfied with the EBCx program. The commissioning agent thought that the length of project completion time was too long, and is a significant problem. Project delays can potentially result in a number of unfavorable outcomes: <ul style="list-style-type: none"> <li>An inability for customers to realize monetary savings from efficient equipment installs</li> <li>An inability for IESO to realize energy savings from said installs until completion</li> <li>Program customer and project attrition</li> <li>Potentially decreased customer satisfaction levels</li> </ul> </li> <li>In general, project length may be explained in part by what the commissioning agent described as “onerous” data gathering and reporting requirements, corporate budget re-evaluation when projects are extended into subsequent fiscal years, the attrition of energy managers incentivized through the program in these cases, and in delays by some LDCs in completing reviews of required reports.</li> </ul>	<ul style="list-style-type: none"> <li>Consider reducing the number of reports, specifically those required at each of the four stages of the program. The commissioning agent suggested reducing this number to two. This would reduce monetary expenditures on data gathering and reporting by participants and incentivized by IESO, would reduce the potential for delays in the reporting and review processes, and ultimately shorten project completion time.</li> <li>Formalizing a project management role and an implementation schedule within the program would help ensure the meeting of deadlines and accountability in doing so. This addresses the need in the program for a group familiar with the program deadlines, pressures, and requirements, and the issues faced by corporate customers.</li> </ul>	Low	<ul style="list-style-type: none"> <li>The IESO, in collaboration with LDCs, intends to review the effectiveness of the Existing Building Commissioning Program in the Conservation First Framework portfolio.</li> </ul>
13.	Cross-cutting	<p><b>Continue to Improve IESO Responsiveness</b></p> <ul style="list-style-type: none"> <li>In 2017, LDC staff thought communications from the IESO were excellent or good; relatively similar levels of responsiveness were seen in 2017 as in 2016, though comparisons should only be considered directly as results are not statistically significant across years. IESO communications were assessed in three areas: overall communications (83% rated as excellent/good in 2017; 78% in 2016), adequacy or completeness of responses to inquiries or requests for clarification (73% rated as excellent/good in 2017; 81% in 2016), and timeliness of responses (77% rated as excellent/good in 2017; 78% in 2016).</li> </ul>	<ul style="list-style-type: none"> <li>Continue to improve IESO responsiveness both in terms of quality of responsiveness and timeliness of response to LDC inquiries or requests for clarification.</li> </ul>	Low	<ul style="list-style-type: none"> <li>The IESO’s has three resources who are dedicated to supporting LDCs with gathering information and resolving issues. The broader Alliances team also manages a weekly E-Blast which includes articles with updates across the Conservation industry along with regular webinars to provide in-depth information on relevant topics. For program specific inquiries, the IESO has developed a repository of questions and answers to improve the timeliness and consistency of responses to LDCs.</li> </ul>
14.	Cross-cutting	<p><b>Continue to Improve Marketing Materials and Resources</b></p> <ul style="list-style-type: none"> <li>In 2017, the evaluation team performed a review of a subset of the</li> </ul>	<ul style="list-style-type: none"> <li>Continue to look for opportunities to improve upon existing—and develop additional—marketing materials</li> </ul>	Low	<ul style="list-style-type: none"> <li>The IESO recently launched an updated Save on Energy website with a focus on providing information that is relevant to</li> </ul>

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		<p>most common types of marketing materials and resources that the IESO and a subset of LDC staff have developed in support of the Save on Energy Business Programs. Common marketing materials included brochures, bill inserts, web pages, case studies, and sell sheets. The analysis has indicated that the marketing materials and resources reviewed were generally clear and effective for customers and vendors to utilize. While most materials reviewed were of good quality and clarity, there were some materials that the team determined to be lower quality, typically due to a lack of information to facilitate participation. This included missing phone and/or email addresses, and/or no information regarding eligibility. Brochures and Case Studies most often lacked this information.</p> <ul style="list-style-type: none"> <li>Some participants who responded to the process and NTG surveys indicated a desire for more clarity or more effective materials; participants often suggested making the materials more user friendly and straightforward, ensuring that information on materials do not conflict with information from LDCs or vendors, and ensure delivery of all materials. Some vendors indicated additional marketing support from the LDCs or the IESO would better support them in their efforts to engage customers. Given this feedback, further opportunities may exist to engage customers or support vendors with additional or updated marketing materials and resources in future program years.</li> </ul>	<p>and resources to engage customers and support vendors.</p>		<p>customers. The revamped website is intended to be more user-friendly and includes a greater focus on case study content.</p> <ul style="list-style-type: none"> <li>The IESO will continue to work with LDCs to improve the quality of marketing materials in resources through the Marketing Campaigns Task Committee.</li> </ul>