2015 Evaluation Report for the Home Assistance Program

FINAL

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<tbody>
<tr>
<td>AAPOR</td>
<td>American Association for Public Opinion Research</td>
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<tr>
<td>CFF</td>
<td>Conservation First Framework</td>
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<td>FAST</td>
<td>Field Audit Support Tool</td>
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<td>FR</td>
<td>Free-Ridership</td>
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<td>HAP</td>
<td>Home Assistance Program</td>
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<td>IESO</td>
<td>Independent Electricity System Operator</td>
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<td>ISR</td>
<td>In-Service Rate</td>
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<td>LDC</td>
<td>Local Distribution Company</td>
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<td>NTGR</td>
<td>Net-to-Gross Ratio</td>
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<td>OPA</td>
<td>Ontario Power Authority</td>
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<td>RR</td>
<td>Response Rate</td>
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<td>SO</td>
<td>Spillover</td>
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1. Executive Summary

The Independent Electricity System Operator (IESO) contracted Opinion Dynamics (the evaluation team) to conduct impact and process evaluations of the Low-Income Initiative, marketed as the Home Assistance Program (HAP). Previous evaluation reports submitted by the evaluation team covered the 2011/2012, 2013, and 2014 program periods. This report presents the impact and process evaluation results covering the period from January 1, 2015 to December 31, 2015 (2015 program year).

1.1 Summary of Evaluation Goals and Objectives

The 2015 evaluation had the following objectives:

- Determine gross and net energy savings and peak demand reductions achieved in 2015
- Complete a process evaluation that identifies opportunities for improvement of HAP and assess any gaps in the program’s design and delivery
- Assess potential behavioural savings impacts of energy education and materials provided by HAP identified during the 2014 program evaluation

1.2 Summary of Impact Evaluation Results

The evaluation team verified the gross energy and demand savings claimed in the HAP participant database for projects completed in 2015. Low-income direct install programs similar to HAP typically assume a net-to-gross ratio (NTGR) of 1.0, as free-ridership (FR) and spillover (SO) are characteristically low. As such, 2015 net verified savings are equal to gross verified savings.

Based on participant data records provided by the IESO, the evaluation team determined that HAP resulted in 2,438 kW and 16,052,556 kWh of net savings in 2015, as shown in Table 1-1. Realization rates for 2015 were 96% for demand and 88% for energy savings, which represented substantial increases from 49% and 78%, respectively, in 2014. Although overall participation decreased from 2014, per-project energy savings increased from 766 kWh to 971 kWh and per-project demand savings increased from 0.096 kW to 0.147 kW.

<table>
<thead>
<tr>
<th>Table 1-1. Summary of 2015 Impact Evaluation Results</th>
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<tbody>
<tr>
<td>Number of Participants</td>
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<tr>
<td>Net Verified Demand Savings (kW)</td>
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<td>Net Verified Annual Energy Savings (kWh)</td>
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<td>Demand Savings Realization Rate</td>
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For the 2015 HAP impact evaluation, the evaluation team conducted a comprehensive review of program deemed savings assumptions for non-weatherization measures. We reviewed each measure’s savings assumption and compared them to the latest relevant literature and research. Based on the modeling and

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1 In 2015, HAP used project-specific building energy models to determine weatherization savings and is transitioning to estimating weatherization savings using a simplified set of assumptions and algorithms in the future.
literature review, several measures required revisions to their assumptions, which applied to the 2015 verified savings results.

As part of the 2015 impact evaluation, the evaluation team researched and calculated measure-specific installation rates. The installation rate for each measure is the ratio of the quantity still installed at the time of the participant survey\(^2\) to the quantity reported by the program. Table 1-2 provides the impacts of deemed savings adjustments and in-service rates (ISRs) on program-wide savings, along with the NTGR, which is 1.0, or 100%.

<table>
<thead>
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<th>Table 1-2. Summary of 2015 HAP Savings Adjustment Factors</th>
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<tr>
<td>Deemed Energy Savings Adjustment</td>
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<tr>
<td>Deemed Demand Savings Adjustment</td>
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<tr>
<td>Installation Rate Energy and Demand Savings Adjustment</td>
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<td>HAP NTGR</td>
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Impact evaluation key findings:

- HAP verified energy savings decreased 18% from 2014 to 2015, dropping from 19.7 GWh to 16.1 GWh. Verified demand savings decreased by a smaller degree from 2.48 to 2.44 MW from 2014 to 2015. The decrease in savings is primarily due to a 36% decrease in program participation from 25,712 in 2014 to 16,526 in 2015.

- Average savings per project in 2015 were higher than in 2014. In 2015, on average, HAP projects saved 971 kWh and 0.15 kW of demand, compared with 766 kWh and 0.10 kW in 2014. This increase is due primarily to a larger share of participants receiving weatherization measures, such as insulation and draft proofing. Average savings per project are considerably higher for participants receiving weatherization measures (4,359 kWh and 1.5 kW).

- A comprehensive engineering review of deemed savings recommended by the 2014 evaluation resulted in updates to recommended values for 25 of the 30 non-weatherization measures offered in 2015.

1.3 Summary of Process Evaluation Results

The process evaluation involved the collection of both primary and secondary data. The evaluation team gathered primary data through interviews with program staff, local distribution companies (LDCs), delivery agencies, and program participants. In addition to these primary data collection efforts, the evaluation team reviewed a variety of program materials.

Process evaluation key findings:

- Program participation decreased by 36% from 2014 to 2015 (from 25,712 to 16,526). As in prior years, many participants originated from social housing, with some LDCs focusing exclusively on social housing, sometimes coordinating directly with social housing providers. However, untapped

\(^2\) Through a telephone survey, a sample of 2015 participants verified quantities of each measure received and installed through the program. Respondents were also asked to verify the number of each measure that remained installed at the time of the survey (April and May 2016).
social housing opportunities are becoming scarcer, which is likely a large source of the overall reduction in program participation in 2015. LDCs and delivery agencies have reported substantial barriers to identifying and marketing the program to eligible non-social housing residents. Some LDCs have seen some success working with trusted local aid agencies, such as the Salvation Army or Ontario Works, to identify and, in some cases, prequalify HAP participants not residing in social housing.

- Few participants reported engaging in energy-saving behaviours as a direct result of program participation, despite previous findings—from the 2014 participant survey—indicating that those who received the program’s educational component more often took certain energy-saving actions. The 2015 survey asked more explicitly about when these behaviours began and the extent to which the program influenced them. This more in-depth examination of participant motivations revealed that a large portion of respondents who took these actions began engaging in them prior to participating in the program.

1.4 Conclusion and Recommendations

The evaluation team provides several recommendations below, based on the evaluation results and findings discussed throughout this report. In addition, some recommendations made in prior HAP evaluations were still relevant to HAP in 2015. However, as the LDCs transition to the new Conservation First Framework (CFF) in 2015 and 2016, they are undertaking a number of critical program changes that will likely address many of the current and past evaluation findings and recommendations.

- **Emphasize identification of weatherization project opportunities.**

  Weatherization measures could become a larger source for program savings as the program enrolls more participants outside of social housing facilities. While only 6% of 2015 projects included weatherization measures, 58% of demand savings came from weatherization measures. Focusing on LDC awareness of the potential for weatherization savings in electrically heated homes and lowering administrative barriers will help facilitate an increase in weatherization projects.

- **To identify qualifying participants, HAP will need to further leverage existing social service delivery networks as the program transitions away from its social housing focus.**

  Many LDCs have had success identifying eligible participants outside of social housing communities by tapping into existing networks and groups that are already providing services to low-income customers. Building strong partnerships with these organizations adds credibility to HAP in the eyes of potential participants, and helps build trust within communities that HAP serves. To address the diminishing availability of social housing participants, the evaluation team recommends that program resources be focused on identifying and leveraging such opportunities.

- **Provide clear programming/installation instructions for measures that are programmable or not installed at time of delivery.**

  Several of the lowest ISRs resulted from measures never being installed or programmed. Participants installed and programmed only 46% of the block heater timers that they received in 2015 (72% of which they never installed and 28% of which were never programmed). Similarly, among recipients of programmable thermostats, 75% reported that the measure was actually installed, of which 22% were installed but never programmed.
Update deemed savings values in the Field Audit Support Tool (FAST) to be consistent with the latest evaluated values.

A comprehensive engineering review of non-weatherization deemed savings assumptions resulted in recommended adjustments to per-unit deemed savings values for 25 of the 30 non-weatherization measures offered by HAP in 2015. Adopting these recommendations and incorporating them into the FAST for future program years will improve the accuracy of reported savings and make them more consistent with evaluated savings.

The program-tracking data should include savings estimates for all reported projects, with particular emphasis on weatherization projects.

In many cases, energy savings data were not included in the program-tracking data provided to evaluators. However, the IESO reportedly places emphasis on ensuring that these data are included when LDCs and delivery agents report their progress. It is unclear whether the data are not being transmitted properly to the IESO or are only not being relayed to program evaluators.

Provide consistent information and educational materials to all participants to maximize HAP’s behavioural impact.

Fewer 2015 participants reported receiving the full educational component (delivery of informational written material along with verbal explanation) than in 2014. While 2014 participant feedback suggested that the program could be promoting considerable behavioural change, the 2015 participant survey data showed a lesser degree of potential behavioural change attributable to the program. Consistent delivery of both written and verbal information to participants may increase the program’s influence on customer behaviour.

When conducting the extended weatherization audits, delivery agents should collect data on cooling systems present in each home.

Delivery agents installing weatherization measures should collect and incorporate data on the presence of central air conditioning to ensure that LDCs claim energy and demand savings for each project as accurately as possible. These data will also allow the evaluation team to more closely understand what percentage of customers in the program have air conditioning so that assumptions used for estimating energy and peak demand impacts can be appropriately updated.
2. Introduction

This report presents the results of the evaluation of the Ontario province-wide Low-Income Initiative, marketed as the Home Assistance Program (HAP). The remainder of this section presents the objectives of the 2015 evaluation, followed by an overview of the purpose of HAP, the program’s goals, and the structure and content of this evaluation report.

Note that in 2015, local distribution companies (LDCs) began to transition from the existing, or legacy, framework to the new Conservation First Framework (CFF). Under CFF, HAP is undergoing a number of important changes regarding program administration and implementation. The LDCs made this transition at different times throughout the year. This evaluation focuses on HAP participation during the calendar year regardless of when the LDCs transitioned to CFF.

2.1 Evaluation Objectives

The 2015 evaluation had the following objectives:

- Determine gross and net energy savings and peak demand reductions achieved in 2015
- Complete a process evaluation that identifies opportunities for improvement of HAP and assess any gaps in the program’s design and delivery
- Assess potential behavioural savings impacts of energy education and materials provided by HAP identified during the 2014 program evaluation

2.2 Program Purpose

HAP seeks to improve electric energy efficiency in the homes of income-qualifying Ontarians and to enable residents to manage their electricity use more effectively. In an effort to maximize customer participation and energy savings generated, HAP employs a “whole-home approach.” The program representative presents the consumer with energy efficiency opportunities for all energy end uses within the home, helping the consumer to understand how these systems interconnect through an in-home audit, and retrofits installs selected measures deemed applicable to each participant’s premise. An educational component, including energy management strategies presented in the form of both leave-behind materials and recommendations from the program representative, complements the measures installed through the program.

In gas-heated homes, HAP looks to achieve the whole-home approach by coordinating the delivery of existing gas utility-funded low-income programs alongside HAP. As such, the program administrator encourages the LDCs to engage gas utilities in the marketing and delivery of the program.

2.3 Program Goals

HAP expects to realize the following goals:

- Reductions in electricity consumption of the existing low-income housing stock in Ontario
- Electricity demand reductions and energy savings
Introduction

- Adoption of conservation behaviours by participating low-income households
- Improvements in the knowledge of low-income Ontarians on how to effectively manage electricity costs
- Support for utility service continuity
- Coordination of the delivery of electric and natural gas offerings to low-income customers

The IESO provides funding to the LDCs to deliver HAP, either through their own internal resources or through service providers. Low-income participants receive the following measures and their installation at no charge:

- Basic measures: screw-in CFL bulbs, block heater timers, smart power bars, efficient shower heads, faucet aerators, and hot water pipe wrap/tank insulation
- Extended measures: ENERGY STAR® refrigerators, freezers, window air conditioning units, dehumidifiers, and programmable thermostats
- Weatherization measures: draft proofing, attic insulation, wall insulation, and basement insulation

Eligibility for the program is based on individual or household income and whether or not household members are participants in certain social benefits programs in Ontario. Additionally, residents of social housing communities may prequalify for the program, and, as a result, may bypass portions of the application process.

2.4 Report Overview

The remainder of this report describes the impact and process evaluations of HAP. Each evaluation includes a methodology, results, and a recommendations subsection.

The 2015 impact evaluation contained the following components:

- Program-tracking data review: The evaluation team cross-referenced 2015 projects against those reported in previous years, confirmed project audit completion dates, and reconciled discrepancies between measure units and associated savings and costs.
- Updated in-service rates (ISRs): Through a survey of participants, the evaluation team quantified the percentage of each type of measure received through the program, the portion installed, and the portion still installed at the time of the survey.
- Revised deemed savings values: The evaluation team completed a comprehensive review of the underlying measure-specific savings recommended by the 2014 program evaluation, updating values where necessary to reflect latest available data.

The 2015 process evaluation of HAP included the following areas of research:

- In-depth interviews with program administration and delivery staff, including representatives from the Independent Electricity System Operator (IESO), LDCs, and delivery agents
- Review of program documents, such as the program’s schedule and implementation protocols
Introduction

- A telephone survey of 2015 HAP participants about their program participation, awareness, and satisfaction
- Program-tracking data review of participation and data quality and completeness
3. Impact Evaluation

In this section, the evaluation team presents the methods, results, and recommendations from the 2015 impact evaluation of HAP. This section includes a comparison of the program’s energy and demand savings determined through the evaluation (verified savings) to the savings listed in the program-tracking data (reported savings). The most detailed measure-level data available from program-tracking systems were used to estimate verified and measure-level savings.

3.1 Methodology

The evaluation team’s determination of 2015 verified savings involved several steps. First, the program-tracking database was reviewed, followed by removal of any erroneous records. Since a large portion of the program-tracking data was missing actual energy savings for each reported measure, we applied deemed savings values used by the current Field Audit Support Tool (FAST) to determine gross reported energy and demand savings. The evaluation team then reviewed, researched, and revised measure-specific deemed savings assumptions and ISRs. Finally, we applied these updated values to determine gross verified impact results. A net-to-gross ratio (NTGR) of 1.0 was applied at the program level.

3.1.1 Program-Tracking Data Review

The evaluation team reviewed the reported program participation database, checking listed projects against those reported in previous years, confirming project audit completion dates, and reconciling discrepancies between measure units and associated savings and costs.

Files provided by the program administrator, in Microsoft Excel format, contained 88,726 projects and were the basis of the program-tracking database review. After comparison with project lists from prior years and confirming missing project dates with individual LDCs, 60,854 were attributable to completion dates prior to 2014 and were excluded from the 2015 program analysis. After resubmitting the remaining 27,872 projects to individual LDCs for date verification, 27,185 unique projects were confirmed as completed in 2015 or 2014 and unaccounted for in previous evaluations. Of these, 16,526 were completed in 2015 as part of HAP (15,494 legacy and 1,032 CFF, based on the LDC-specific framework transition schedule).

Over the course of the data-cleaning process, the evaluation team identified and removed or combined duplicate records based on a number of criteria, including FAST file IDs, installed measures, savings values, measure costs, audit costs, audit completion dates, and participant contact information. Audit dates, LDC names, and other formatting conventions used in the HAP participant database were standardized.

Fewer than 30% of 2015 HAP projects reported energy and demand savings for the measures installed. The evaluation team therefore applied measure-specific per-unit deemed savings values used in the current FAST to represent reported savings for non-weatherization measures. Among projects with insulation or draft-proofing, for which savings are calculated using project-specific building energy models, only 65% reported energy and demand savings. Ex ante savings for the remaining 35% of weatherization projects were calculated based upon the average per-unit savings for the same measures provided for the projects that reported savings.

Similar to previous years, there were select incidents where blocks of data were incorrectly labeled or placed under the wrong columns. These incidences were isolated and not necessarily associated with specific LDCs or similar projects. While these issues were identified and corrected for, they are a potential source of error for future attempts to assess savings.
3.1.2 Measure In-Service Rates

The evaluation team applied ISRs determined by participant survey responses. Each survey respondent was asked a battery of questions to verify the quantity of measures received, the number of received measures that were installed, and the number of those installed measures that were still installed at the time of the survey. ISRs represent the self-reported quantity of measures still installed relative to reported quantities in the program-tracking data.

To best identify differences in program implementation across LDCs, accounting for different types of measures, we stratified the participant survey sample by LDC and measure category. Ten measure categories and seven LDC strata were established to develop and apply ISRs, and quotas were set for each of the 57 strata based on the distribution of measures in the program-tracking database and the coefficient of variation found by the 2014 program evaluation. We applied stratum-specific ISR values in cases where the quota was met and used the measure category average across LDCs in cases where it was not.

For recipients of programmable measures (i.e., thermostats and block heater timers), the survey included an additional question asking whether the measure had been programmed. Measures reported never to have been programmed were treated as uninstalled. The survey verified the receipt but not the installation of refrigerators, freezers, hot water tank and pipe wrap, and weatherization measures.

3.1.3 Engineering Review of Savings Assumptions

We completed a comprehensive review of the assumptions behind measure-specific deemed savings values used in the program FAST. Based on review of available information, including technical resource manuals, previous program evaluations, and participant survey responses, we updated deemed savings values for 25 of the 30 non-weatherization measures offered during the 2015 program year.

3.1.4 Net-to-Gross Ratio

Typically, income-qualified direct-install programs like HAP do not apply a researched NTGR, given the assumption that free-ridership (FR) and spillover (SO) rates are very low for low-income programs. FR represents the percentage of savings that would have been achieved in the absence of the program. SO represents the percentage of the total savings achieved without program rebates that would not have occurred in the absence of the program.

To test these assumptions, in 2013, the evaluation team conducted NTGR research based on the participant survey for the edification of the Ontario Power Authority (OPA), the LDCs, and the delivery agents. As expected, FR and SO rates were low. For this reason, for the 2015 impact evaluation, we assume a NTGR of 1.0 when reporting net savings values. Details on the methods and results of the 2013 NTGR research are in the 2013 HAP Evaluation Report.

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3 Total number of strata is less than maximum possible of 70 because not all LDCs provided all measure types in 2015.
3.2 Results

Using the methods described above, the evaluation team calculated the net verified energy and demand savings from the 16,526 HAP participants in 2015. Verified savings are compared to the measure- and project-level reported savings to calculate realization rates at the project, LDC, and program level. Table 3-1 summarizes the program-level results.

| Table 3-1. HAP Verified Net Savings (2015) |
| kW | 2,552 | 2,438 | 96% |
| kWh | 18,253,228 | 16,052,556 | 88% |

* These values are based on the reported measures in the dataset cleaned by the evaluation team and application of deemed savings values from the FAST where savings were not in tracking data.

Realization rates for peak demand increased from 49%\(^4\) in 2014 to 96% in 2015. The realization rate for energy savings was 88% in 2015, which was higher than the 78% observed in 2014. These changes reflect a combination of changes to measure mix, deemed savings assumptions, ISRs, and the method for determining reported savings. While the 2014 realization rate reflected a comparison of verified savings to those savings provided in the tracking data, the 2015 realization rate predominately reflects a comparison of verified savings to savings imputed from program deemed values when savings were not provided in the tracking data.

Similar to prior years, in 2015, weatherization measures accounted for a substantial portion of demand savings, despite being included in only a small number of HAP projects. Also as in previous years, lighting measures accounted for the largest share of energy savings. Figure 3-1 and Figure 3-2 show the percent of overall kW and kWh savings represented by each measure group. Appendix A provides a complete list of HAP measures that fall into each group. In addition, Appendix B provides a complete list of kW and kWh savings by measure, including the count of unique participants who received the measure and the quantity of each.

\(^4\) The low realization rate for demand savings in 2014 resulted from the use of an outdated version of the FAST that overestimated demand savings for weatherization measures in particular.
Figure 3.1. Percent of 2015 Verified kW and kWh Savings by Measure Group

* “Other” includes air conditioning units, block heater timers, power bars, and programmable thermostats.

3.2.1 Annual Trends

Total verified program energy savings decreased from 2014 to 2015, while total demand savings remained relatively consistent. Figure 3-2 shows evaluated energy and demand savings from 2011 to 2015. The decrease in energy savings is largely due to decreased participation (discussed in detail in Section 4.2.1).

Figure 3-2. HAP Verified Savings from 2011 to 2014

Note: HAP began in late 2011 and had very low program participation. As such, the 2011 and 2012 program years were evaluated together.
Counteracting the decrease in program participation, the per-project energy and demand savings on average increased significantly in 2015. Per-project energy savings increased 27% from 766 kWh in 2014 to 971 kWh in 2015. Concurrently, per-project demand savings increased 53% from 0.096 kW in 2014 to 0.147 kW in 2015. Figure 3-3 illustrates the differences in per-project verified savings from 2011 to 2015.

**Figure 3-3. HAP Per-Project Verified Savings from 2011 to 2015**

Much of the increase in per-project energy and demand savings results from changes in the measure mix. Figure 3-4 shows the share of energy savings associated with each of the measure groups from 2011 to 2015 on an annual basis. Lighting measures, for example, are responsible for a gradually decreasing share of energy savings each year, largely because of the increased baseline efficiency of bulbs due to Canada’s Energy Efficiency Regulations. Savings calculations for lighting measures assume greater baseline efficiency over time for 40-, 60-, 75-, and 100-watt equivalent CFLs installed by the program. Greater shares of energy savings coming from weatherization measures, refrigerators, and freezers counteracted decreases in the energy savings attributable to lighting measures.
Figure 3-4. Percent of kWh Savings by Measure Group Year over Year

* “Other” includes air conditioning units, block heater timers, power bars, and programmable thermostats.

Figure 3-5 illustrates the share of overall demand savings attributed to each measure group for each year of HAP. While lighting measures contributed a smaller share of demand savings each year, the proportion of demand savings coming from weatherization measures increased steadily. The portion of projects including weatherization measures increased from 3% (827 projects) in 2014 to 6% (960 projects) in 2015.

Figure 3-5. Percent of kW Savings by Measure Group Year over Year

* “Other” includes air conditioning units, block heater timers, power bars, and programmable thermostats.

Projects with weatherization measures showed a 26% increase in demand savings, from 1,114 kW in 2014 to 1,407 kW in 2015. This translates to 1.35 kW per project in 2014 and 1.47 kW per project in 2015. For
one LDC responsible for more than half of all HAP weatherization projects, 37% of its projects included
weatherization; these projects accounted for 81% of its energy savings and 95% of its peak demands
savings. Figure 3-6 shows the difference in average per-project savings for all projects and for those that
included weatherization measures.

![Figure 3-6. Per-Project Savings Comparisons](image)

### 3.2.2 Measure In-Service Rates

This section discusses the installation rates for each HAP measure category. To best represent any
differences in implementation practices across LDCs, the evaluation team stratified the participant survey
sample by measure category and by several of the largest LDCs in terms of program participation. We set
target response quotas for each measure group and LDC and used stratum-specific ISR values to adjust
savings only if the quota was met. We used the average ISR across all LDCs in cases where we were unable
to meet the target quota of respondents. This method is further explained in Section 3.1.2, and Table 3-2
illustrates the ISR values used for each stratum.
For the benefit of program administrators and implementers, Table 3-3 breaks the final installation rates into three different components: the rate of tracked equipment received by participants, the rate of received equipment installed, and the rate of installed equipment still installed at the time of the survey. The final installation rates are the product of these three preceding components (i.e., the portion of equipment in the tracking data still installed at the time of the survey). See Section 4.1.4 for more details on this methodology.

The final installation rates researched in 2015 were similar to those in 2014, with a few notable exceptions. Block heater timers had a substantially lower ISR in 2015 (34%) than in 2014 (89%), and programmable thermostats had a much higher ISR in 2015 (75%) than in 2014 (53%).

* These measures were defaulted to 100%, as many participants were not able to verify installation, particularly for those cases where a property manager may be responsible for these areas.

Table 3-3. HAP Measure ISRs by Measure Group

<table>
<thead>
<tr>
<th>Simplified Measure Name</th>
<th>Rate Received</th>
<th>Rate Installed</th>
<th>Rate Still Installed</th>
<th>Final ISR</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFL</td>
<td>97%</td>
<td>89%</td>
<td>95%</td>
<td>82%</td>
</tr>
<tr>
<td>Faucet Aerator and Shower Head</td>
<td>85%</td>
<td>87%</td>
<td>88%</td>
<td>65%</td>
</tr>
<tr>
<td>Dehumidifier</td>
<td>94%</td>
<td>96%</td>
<td>100%</td>
<td>90%</td>
</tr>
<tr>
<td>Programmable Thermostat</td>
<td>100%</td>
<td>75%</td>
<td>100%</td>
<td>75%</td>
</tr>
<tr>
<td>Power Bar</td>
<td>89%</td>
<td>76%</td>
<td>94%</td>
<td>63%</td>
</tr>
<tr>
<td>Block Heater Timer</td>
<td>74%</td>
<td>46%</td>
<td>100%</td>
<td>34%</td>
</tr>
<tr>
<td>Window Air Conditioner</td>
<td>98%</td>
<td>89%</td>
<td>100%</td>
<td>88%</td>
</tr>
<tr>
<td>Refrigerator and Freezer</td>
<td>99%</td>
<td>100%</td>
<td>100%</td>
<td>99%</td>
</tr>
<tr>
<td>Hot Water Tank/Pipe Insulation*</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Weatherization Measures*</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

* These measures were defaulted to 100%, as many participants were not able to verify installation, particularly for those cases where a property manager may be responsible for these areas.
Additionally, ISRs for lighting measures were higher in 2015 (82%) than in 2014 (70%). Participants reported receiving almost all (97%) of the CFLs recorded in the program-tracking database. About 89% of these were actually installed by the program representative or the participant, and the program participant later removed 5% of these. When asked why bulbs were not installed, participants said that they did not need any more bulbs. When asked why bulbs were removed, participants cited reasons including bulbs burning out or simply not liking the CFLs installed. Some participants also mentioned that they removed the CFLs and replaced them with other types of bulbs, including LEDs. We defaulted ISR to 100% for weatherization and hot water tank and pipe insulation due to possible lack of participant understanding and awareness of these measures.

3.2.3 Engineering Review of Savings Assumptions

Based on a review of technical resource manuals, other program evaluations, and participant survey responses, we updated deemed savings values for 25 of the 30 non-weatherization measures offered during the 2015 program year. These revisions are outlined below and are expanded on and explained in Appendix G.

Per-unit energy and demand savings dropped most substantially for block heater timers, dehumidifiers, shower heads, and faucet aerators. However, a moderate increase in per-unit savings for refrigerators, which make up a large portion of overall savings, helped offset the combined effect of the deemed savings adjustment. Deemed savings values remained relatively consistent across lighting measures, which made up the largest portion of the program’s energy savings in both 2014 and 2015. The adjustments to deemed savings values had very little effect on overall program savings in 2015 given the overall measure mix and relative savings across measures.

3.3 Recommendations

Based on the impact evaluation findings discussed above, the evaluation team suggests the following:

- **Update deemed savings values in the FAST to be consistent with latest evaluated values.**

  A comprehensive engineering review of non-weatherization deemed savings assumptions resulted in recommended adjustments to per-unit deemed savings values for 25 of the 30 non-weatherization measures offered by HAP in 2015. Adopting these recommendations and incorporating them into the FAST for future program years will improve the accuracy of reported savings and make them more consistent with evaluated savings.

- **The program-tracking data should include savings estimates for all reported projects, with particular emphasis on weatherization projects.**

  In many cases, energy savings data were not included in the program-tracking data provided to evaluators. However, the IESO reportedly places emphasis on ensuring that these data are included when LDCs and delivery agents report their progress. It is unclear whether the data are not being transmitted properly to the IESO or are only not being relayed to program evaluators.

- **When conducting the extended weatherization audits, delivery agents should collect data on cooling systems present in each home.**

  Delivery agents installing weatherization measures should collect and incorporate data on the presence of central air conditioning to ensure that LDCs claim energy and demand savings for each project as accurately as possible. This data will also allow the evaluation team to more closely
understand what percentage of customers in the program have air conditioning so that assumptions used for estimating energy and peak demand impacts can be appropriately updated.
4. **Process Evaluation**

4.1 **Methodology**

The process evaluation involved the collection of both primary and secondary data. Primary data was gathered through interviews with program staff, LDCs, implementing agencies, and program participants, as summarized in Table 4-1. In addition to these primary data collection efforts, this section also describes the review of a variety of program materials.

<table>
<thead>
<tr>
<th>Table 4-1. 2014 Primary Data Collection Efforts</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="#" alt="Table 4-1" /></td>
</tr>
</tbody>
</table>

### 4.1.1 Program Administrator Staff, LDC, and Delivery Agent Interviews

The evaluation team conducted interviews with program administration staff, the IESO HAP program Lead, as well as HAP program administrators representing three LDCs and two HAP delivery agents. The interviews touched on program design, delivery, and participation, and served four primary purposes:

1. To develop an understanding of all goals and delivery strategies used to gain participation, especially with respect to weatherization projects, and the staff’s and stakeholders’ perspective on the effectiveness of each strategy

2. To better understand participant outreach and education, and potential impacts of program education on energy-saving behaviour

3. To better understand the tracking systems, quality assurance procedures, and audit process and documentation

The evaluation team conducted interviews with program staff from January to July 2015. Five interviews were completed with program administrators at three LDCs and two delivery agencies. LDCs were selected to capture diversity based on several criteria, including: geographic areas, participation levels and engagement in projects with weatherization, to better understand the barriers, benefits, and best practices associated with these projects.

### 4.1.2 Review of Program Materials and Data

The evaluation team conducted a review of program materials, including program databases, materials provided to participating customers, and customer outreach and marketing materials. These activities informed various components of the process assessment. The program materials reviewed included:

- FAST Version 5.5
- Eligibility Intake and Service Guidelines
- Audit and Retrofit Protocols
Process Evaluation

- Conservation First EM&V Protocols 2015-2020
- Framework Transition Schedule

4.1.3 Initiative Database Analysis

Examining the HAP participation data tracked by the program provided us with an understanding of participation and measure uptake, basic participant characteristics, and reported savings. In addition, this analysis characterized data quality and completeness by identifying duplicate records, missing data, and outliers. The findings from this analysis also contributed to the survey sample design parameters and sample design strata. More specifically, the initiative database analysis allowed us to:

- **Characterize Participation:** The evaluation team used the results of the database analysis to help characterize HAP participation and savings and to identify annual trends. This review documented participant and measure counts, measure uptake, reported savings, and where the savings came from in terms of measures and LDCs.

- **Document Data Inconsistencies and Provide Recommendations for Future Tracking:** Through this effort, the evaluation team assessed the integrity of the program-tracking data, identifying and reconciling duplicative, missing, and erroneous data. This was a necessary first step in determining gross savings prior to verification efforts (i.e., analyzing a sample of projects and verifying measure installations through participant surveys described in subsequent tasks).

- **Build Sample Frames:** In developing the participant survey sample, the evaluation team assessed participant characteristics, measure counts, and other factors to determine the most appropriate sampling approach and to take inventory of the availability and completeness of customer contact information. As part of the gross impacts calculations, the evaluation team conducted a basic inventory and analysis of available participant data, which included the removal of duplicates and identification of missing data. The corrected data set was used to build sample frames for the surveys.

The database analysis of 2015 participants is based on a final extract from the HAP participant database accessed on March 16, 2016, and augmented with additional batches pulled May 12, 2016 and June 10, 2016. These data were used to develop a representative sample of 2015 participants for the participant survey.

4.1.4 Participant Survey

The evaluation team administered a telephone survey of 2015 HAP participants. Interviews were completed with 356 customers between April 20 and May 6, 2016. The following section discusses the survey instrument and sample design methodologies.

**Survey Instrument Design**

Participant surveys are a key component of assessing program impacts and effectiveness. The 2015 HAP participant survey was developed to estimate ISRs, gauge participant satisfaction and perception, and better understand possible behavioural impacts of program participation.
The participant survey was developed in accordance with the 2015–2020 Conservation First EM&V Protocols, which cover requirements for market effects research and analysis. The survey includes questions that explore the following topics:

- Impact-related analysis:
  - Verified receipt, installation, and persistence of measures
  - Collected home specifications to inform deemed savings review

- Process-related analysis:
  - Measure satisfaction
  - Reasons for not installing or removing measures
  - Behavioural changes directly attributable to the program’s training and education efforts
  - Source of program awareness and method of enrollment
  - Non-energy benefits realized by participants
  - Participant profile information, such as demographics, geography, housing characteristics, and other key characteristics that could be used for future outreach and marketing efforts

The full survey instrument is provided as Appendix F of this report.

**Participant Survey Sample Design**

The evaluation team used an approach in the survey that prioritized the less common measures for selection in the sample, such as block heater timers and weatherization measures, to ensure that adequate information on each measure was collected. For the 2015 participant survey, all respondents were asked about each type of measure that they reportedly received, according to the HAP participant data. Each of the 34 HAP measures was assigned to 1 of 10 measure categories, based on equipment type and analogous end-use. For example, the survey grouped all screw-in CFLs together, and did not differentiate between refrigerators and freezers. Appendix A provides a complete list of measures and their associated categories.

The initial sample frame included 5,212 participants represented by 59 LDCs. We submitted requests to each LDC for participant phone numbers, and received the necessary contact information for 3,810 customers. Table 4-2 shows the survey dispositions for the 3,654 of these numbers that were loaded for calling. The survey response rate was 13.3%, which is typical for telephone surveys of efficiency program participants.

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5 The sample for the 2015 participant survey was based on the initial extract of 87,488 customers from the HAP participant database, supplied in March of 2015. Final participant counts provided throughout this report are based on several updated extracts from the HAP participant database.
## Table 4-2. Survey Dispositions and Response Rate Inputs

<table>
<thead>
<tr>
<th>Disposition</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete (I)</td>
<td>356</td>
</tr>
<tr>
<td>Completed interviews</td>
<td>356</td>
</tr>
<tr>
<td>Eligible incomplete interview (N)</td>
<td>31</td>
</tr>
<tr>
<td>Callback to complete</td>
<td>14</td>
</tr>
<tr>
<td>Mid-interview terminate - DO NOT CALL BACK</td>
<td>17</td>
</tr>
<tr>
<td>Household with undetermined survey eligibility (UH)</td>
<td>479</td>
</tr>
<tr>
<td>Not dialed</td>
<td>30</td>
</tr>
<tr>
<td>No answer</td>
<td>392</td>
</tr>
<tr>
<td>Busy</td>
<td>22</td>
</tr>
<tr>
<td>Call blocked</td>
<td>35</td>
</tr>
<tr>
<td>Undetermined if a household (UO)</td>
<td>2,167</td>
</tr>
<tr>
<td>Answering machine</td>
<td>1,145</td>
</tr>
<tr>
<td>Not available</td>
<td>57</td>
</tr>
<tr>
<td>Refusal</td>
<td>235</td>
</tr>
<tr>
<td>Language problems</td>
<td>67</td>
</tr>
<tr>
<td>Respondent scheduled appointment</td>
<td>64</td>
</tr>
<tr>
<td>Non-specific callback</td>
<td>177</td>
</tr>
<tr>
<td>Not available callback</td>
<td>422</td>
</tr>
<tr>
<td>Survey-ineligible household (X1)</td>
<td>44</td>
</tr>
<tr>
<td>Did not receive any measures</td>
<td>3</td>
</tr>
<tr>
<td>Does not live in home or refused to go further</td>
<td>25</td>
</tr>
<tr>
<td>No longer lives in residence</td>
<td>16</td>
</tr>
<tr>
<td>Undetermined if a household (X2)</td>
<td>577</td>
</tr>
<tr>
<td>Disconnected phone</td>
<td>383</td>
</tr>
<tr>
<td>Business phone</td>
<td>74</td>
</tr>
<tr>
<td>Computer tone</td>
<td>13</td>
</tr>
<tr>
<td>Duplicate number</td>
<td>5</td>
</tr>
<tr>
<td>Wrong number</td>
<td>102</td>
</tr>
<tr>
<td>Total</td>
<td>3,654</td>
</tr>
</tbody>
</table>

Source: 2015 HAP Participant Survey.
The response rate was calculated using the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR), specifically, AAPOR Response Rate 3 (RR3). RR3 includes an estimate of eligibility for these unknown sample units. The formula used to calculate RR3 is presented below:

$$RR3 = \frac{I}{(I + P) + (R + NC + O) + e_1(UH + e_2(UO))}$$

- $e_1 = \frac{(I + N)}{(I + N + X1)}$
- $e_2 = \frac{(I + N + X1 + U1)}{(I + N + X1 + U1 + X2)}$
- $I$ = Completed interview
- $P$ = Partially completed interview
- $N$ = Eligible incomplete interview
- $U1$ = Household with undetermined survey eligibility
- $U2$ = Undetermined if a household
- $X1$ = Survey-ineligible household
- $X2$ = Not a household

**Survey Response Weighting**

Because phone number availability and implementation processes varied between LDCs, weights are applied to all information derived from the participant survey presented throughout this report. Table 4-3 illustrates the disparity between the percent of projects completed by each LDC stratum in the program population and the share of those represented in the participant survey. Six different weights were created for each LDC stratum (one of the initial seven, Veridian Connections Inc., was regrouped into the “Other” group based on low response rate). These weights were calculated by dividing the percent of each group in the population by the percent in each group that responded to the participant survey.

<table>
<thead>
<tr>
<th>LDC</th>
<th>Percent of 2015 Projects (n=16,526)</th>
<th>Percent of Respondents (n=356)</th>
<th>Applied Response Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro One Networks Inc.</td>
<td>25%</td>
<td>38%</td>
<td>0.67</td>
</tr>
<tr>
<td>Toronto Hydro-Electric System Limited</td>
<td>12%</td>
<td>17%</td>
<td>0.70</td>
</tr>
<tr>
<td>Hydro Ottawa Limited</td>
<td>8%</td>
<td>10%</td>
<td>0.81</td>
</tr>
<tr>
<td>Guelph Hydro Electric Systems Inc.</td>
<td>7%</td>
<td>4%</td>
<td>1.69</td>
</tr>
<tr>
<td>London Hydro Inc.</td>
<td>6%</td>
<td>9%</td>
<td>0.71</td>
</tr>
<tr>
<td>Other LDCs</td>
<td>41%</td>
<td>22%</td>
<td>1.86</td>
</tr>
</tbody>
</table>

---

4.2 Results

The following section discusses the results of the various components of the 2015 process evaluation.

4.2.1 Program Participation

Program participation continues to be a key metric for HAP. This is particularly the case as many LDCs approach saturation of social housing communities in their territories. Driving future participation will remain a challenge. HAP participation was down over the past program year, decreasing from 25,712 in 2014 to 16,526 in 2015. The number of participating LDCs also decreased slightly, from 66 in 2014 to 61 in 2015.

The 2015 participant survey asked respondents both how they first heard about HAP (Figure 4-1) and how they signed up for the program (Figure 4-2). Printed materials are the most common way that customers learn about HAP (30%), and nearly a third of customers sign up via paper applications (32%). Around a quarter of program participants reported that their landlord or building manager initiated their participation in HAP, either making them aware of the program (25%) or signing them up (28%). Direct contact from program staff appears to play a relatively small role in informing participants about the program: Only 7% of customers learned about the program from program staff (either by phone or in person).

*Figure 4-1. How Participants Heard about the Program*

<table>
<thead>
<tr>
<th>Method of Learning</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program flyer/printed material</td>
<td>30%</td>
</tr>
<tr>
<td>Landlord, building superintendent, or building manager</td>
<td>25%</td>
</tr>
<tr>
<td>A friend of family member</td>
<td>22%</td>
</tr>
<tr>
<td>LDC website</td>
<td>7%</td>
</tr>
<tr>
<td>Phone call from program staff</td>
<td>4%</td>
</tr>
<tr>
<td>Community event</td>
<td>3%</td>
</tr>
<tr>
<td>Visit from program staff</td>
<td>3%</td>
</tr>
<tr>
<td>Other (11%)*</td>
<td>11%</td>
</tr>
</tbody>
</table>

* Other includes those who learned about the program via radio, online (not directly through LDC site), or from LDC staff as part of an unrelated interaction.
4.2.2 Measure Satisfaction

Customers who participated in HAP reported high satisfaction with the measures that they received. Across all measures, the mean satisfaction rating on a 7-point scale, where 1 represents “extremely dissatisfied” and 7 represents “extremely satisfied,” was 5.87. Window air conditioners received the highest mean satisfaction rating (6.9), and thermostats received the lowest (5.1). Both of these measures were received by a relatively small number of respondents (8% received a thermostat, and 6% received an air conditioning unit). Nearly all respondents (92%) received CFLs, and most were highly satisfied with them. The mean satisfaction with CFLs was 5.9, with 52% of customers rating the product 7 out of 7. Table 4-4 provides mean satisfaction ratings for each measure group.

Table 4-4. Mean Satisfaction with Measures Among Participants

<table>
<thead>
<tr>
<th>Measure</th>
<th>% of Participants with Measure</th>
<th>Mean Satisfaction</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFL</td>
<td>92%</td>
<td>5.9</td>
<td>327</td>
</tr>
<tr>
<td>Aerator/Shower Head</td>
<td>28%</td>
<td>5.5</td>
<td>98</td>
</tr>
<tr>
<td>Dehumidifier</td>
<td>12%</td>
<td>6.3</td>
<td>41</td>
</tr>
<tr>
<td>Thermostat</td>
<td>8%</td>
<td>5.1</td>
<td>27</td>
</tr>
<tr>
<td>Power Bar</td>
<td>23%</td>
<td>6.2</td>
<td>83</td>
</tr>
<tr>
<td>Block Heater Timer</td>
<td>9%</td>
<td>6.3</td>
<td>31</td>
</tr>
<tr>
<td>Window Air Conditioning Unit</td>
<td>6%</td>
<td>6.9</td>
<td>22</td>
</tr>
<tr>
<td>Refrigerator/Freezer</td>
<td>48%</td>
<td>5.6</td>
<td>171</td>
</tr>
<tr>
<td>Hot Water Tank/Pipe Wrap</td>
<td>12%</td>
<td>6.4</td>
<td>44</td>
</tr>
<tr>
<td>Insulation/Air Sealing</td>
<td>10%</td>
<td>5.8</td>
<td>35</td>
</tr>
</tbody>
</table>
4.2.3 HAP Influence on Energy-Saving Behaviour

One of the goals of the 2015 process evaluation was to assess the potential behavioural changes resulting from the program. The 2014 evaluation found that 95% of surveyed program participants received some form of education through the program, and 37% received the “full educational component,” including energy-saving recommendations from program staff, educational leave-behind materials, and discussion of those materials with program staff. When asked about changes to energy-saving behaviours, those who received the full educational component were more likely to have engaged in the behaviour (see Figure 4-3).

![Figure 4-3. Behaviour Change Reported by Those Receiving Full Education Component in 2014](image)

Based on the 2014 findings, we asked a series of questions to the 2015 participants aimed at quantifying the influence of HAP on several energy-saving behaviours. Customers were asked whether or not they had activated the energy-saving settings on specific appliances in their home. Only 7% of respondents confirmed that they set the water temperature on clothes washers to “cold” only after participating in HAP. These respondents reported a modest level of program influence on their decision. On a 7-point scale, where 1 is “not influential at all” and 7 is “extremely influential,” respondents gave an average rating of 5.6 to the program’s influence on their behaviour change. Eighty-five percent of participants who activated energy-saving settings on an appliance after participating rated the program’s influence at 5 or greater. Figure 4-4 shows the percent of respondents who indicated changing behaviour after participating in the program for each energy-saving action.
The evaluation team estimated the amount of energy savings associated with each of the behavioural changes shown in Figure 4-4 by applying a deemed savings value to each. We also asked participants to rate the program’s influence on their behavioural changes for each measure. Based on the results, we estimate HAP-attributable savings to be 174,528 kWh, or an additional 1.1% of savings. The assumptions and method for these estimates are presented in Appendix G.

This approach to measuring the effects of the program educational component on overall program savings is based on general assumptions about how participants use energy. Ideally, the HAP impact evaluation would include a billing analysis, which would provide a more accurate estimate of overall program savings (from both measure installations and behavioural changes) based on actual energy use by program participants. The behavioural savings results provided here, based on deemed savings assumptions, provide an indication of the impacts of HAP’s educational component and how improving the effectiveness and consistency of this program offering could provide significant energy savings and benefits to program participants.

4.2.4 Non-Energy Benefits of Participation

Participants in HAP experienced a number of additional benefits beyond saving energy. Most customers felt that they were doing something good for the environment (88%), and many cited improvements to their home. More than half of all respondents saw improvements in the light level in their home (57%), and more than a third reported having fewer maintenance costs (38%). Customers also noticed a reduction in their energy bills (29%). More than half of customers who received weatherization measures reported that their home was less drafty (56%), and some noted a reduction in the levels of ambient noise (27%). Additionally, almost half of customers who received weatherization or air conditioning measures said that it became easier to maintain a comfortable temperature in their home (43%). Figure 4-5 includes a breakdown of reported non-energy benefits.

Figure 4-4. Activation of Energy-Saving Settings after Program Participation

<table>
<thead>
<tr>
<th>Setting</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set clothes washer to cold</td>
<td>6%</td>
</tr>
<tr>
<td>Activated computer power-save mode</td>
<td>5%</td>
</tr>
<tr>
<td>Activated TV energy-saving settings</td>
<td>3%</td>
</tr>
<tr>
<td>Regularly air-dried clothing</td>
<td>2%</td>
</tr>
<tr>
<td>Turned off dishwasher heated dry</td>
<td>2%</td>
</tr>
<tr>
<td>Turned down temperature on hot water tank</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
</tr>
</tbody>
</table>

* Asked only of participants with relevant appliance.
4.2.5 Key Findings from Interviews with LDCs and Delivery Agents

The evaluation team spoke with representatives from three LDCs and two delivery agents. These interviews highlighted several strengths of the program, along with a number of barriers that LDCs continue to face. The evaluation team described some of these barriers in the 2014 evaluation of HAP, such as the difficulty identifying eligible participants outside of social housing and some of the administrative burdens associated with HAP, which were repeated in our 2015 interviews.

Two LDCs reported difficulty identifying and marketing the program to eligible participants living outside of social housing communities. To recruit social housing participants, program staff often works directly with social housing managers to organize community events that generate awareness about the program. One LDC staff member described organizing BBQs or apartment-wide meetings with residents, which provides an opportunity for the housing superintendent to vouch for the LDC’s credibility. He indicated that this was very helpful in building trust with tenants and subsequently driving participation. Recruiting outside of social housing is more difficult and requires additional outreach channels. One LDC and one delivery agent said that they implemented a combination of mass marketing approaches, such as bill inserts, direct mailers, radio spots, and online ads. However, the other two LDCs reported that they avoided use of mass marketing approaches completely.

A perceived lack of eligible homes, combined with the cost of conducting the extended audit and blower door test, is a deterrent to more LDCs offering weatherization measures. In some territories, many homes are gas-heated and therefore not eligible for HAP. In addition, two of the three LDCs reported that cost-effectiveness standards were prohibitive for implementing weatherization measures.

LDCs and delivery agents reported a range of approaches to providing education to program participants. All reported that auditors were trained to provide customized feedback and advice regarding energy-saving behaviours as part of their visit, but this education may have been inconsistently delivered. Some interviewees said that they did develop educational materials to provide to participants. The role played by
the delivery agent and the LDC in putting these materials together varied depending on the contractual structure. In addition, providing any kind of education to participants in social housing is a challenge as many are not present during the audit.

4.3 Recommendations

The evaluation team provides several recommendations below, based on the findings discussed in Section 4.2. Though program staff made a number of improvements to program delivery from 2014 to 2015, several of the recommendations highlighted in the 2014 evaluation are still relevant. In particular, the recommendation that the program administrator work with HAP stakeholders to enhance and standardize the program’s education and training component remains relevant. Data quality and completeness, particularly the inclusion of reported savings in the data used by the IESO for evaluation purposes, also remains an important focus. Note that the program is already undertaking some of these changes as part of the transition to the new CFF.

- **Provide consistent information and educational materials to all participants to maximize HAP’s behavioural impact.**

  Fewer 2015 participants reported receiving the full educational component (delivery of informational written material along with verbal explanation) than in 2014. While 2014 participant feedback suggested that the program could be promoting considerable behavioural change, the 2015 participant survey data showed a lesser degree of behavioural change attributable to the program. Consistent delivery of both written and verbal information to participants may increase the program’s influence on customer behaviour.

- **Emphasize identification of weatherization project opportunities.**

  Weatherization measures could become a larger source for program savings as the program enrolls more participants outside of social housing facilities. While only 6% of 2015 projects included weatherization measures, 58% of demand savings came from weatherization measures. Focusing on LDC awareness of the potential for weatherization savings in electrically heated homes and lowering administrative barriers will help facilitate an increase in weatherization projects.

- **To identify qualifying participants, HAP will need to further leverage existing social service delivery networks as the program transitions away from its social housing focus.**

  Many LDCs have had success identifying eligible participants outside of social housing communities by tapping into existing networks and groups that are already providing services to low-income customers. Building strong partnerships with these organizations adds immediate credibility to HAP in the eyes of potential participants, and helps build trust within communities that HAP serves. To address the diminishing availability of social housing participants, the evaluation team recommends that program resources be focused on identifying and leveraging such opportunities.

- **Provide clear programming/installation instructions for measures that are programmable or not installed at time of delivery.**

  Several of the lowest ISRs resulted from measures never being installed or programmed. Participants installed and programmed only 46% of the block heater timers they received in 2015 (72% of which they never installed and 28% of which were never programmed). Similarly, among
recipients of programmable thermostats, 75% reported that the measure was actually installed, of which 22% were installed but never programmed.
## Appendix A. Measures and Measure Categories

<table>
<thead>
<tr>
<th>Measure Number</th>
<th>Measure Category</th>
<th>Measure End Use</th>
<th>HAP Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL twister (60w)</td>
</tr>
<tr>
<td>2</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL twister (75w)</td>
</tr>
<tr>
<td>3</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL twister (100w)</td>
</tr>
<tr>
<td>4</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL tri-light (60-75-100w)</td>
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<tr>
<td>5</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL-PAR30 (75w outdoor)</td>
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<tr>
<td>6</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL-PAR38 (100w indoor)</td>
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<tr>
<td>7</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL-PAR38 (100w outdoor)</td>
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<tr>
<td>8</td>
<td>Lighting</td>
<td>Screw-in CFL</td>
<td>ENERGY STAR qualified CFL-covered A19 (60w)</td>
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<tr>
<td>9</td>
<td>Block Heater Timer</td>
<td>Block Heater Timer</td>
<td>Block Heater Timer (just timer)</td>
</tr>
<tr>
<td>10</td>
<td>Power Bar</td>
<td>Power Bar</td>
<td>Power Bar with integrated timer</td>
</tr>
<tr>
<td>11</td>
<td>Hot Water</td>
<td>Hot Water Tank/ Pipe Insulation</td>
<td>Hot Water Tank Pipe Insulation - ½” (per cu foot)</td>
</tr>
<tr>
<td>12</td>
<td>Hot Water</td>
<td>Hot Water Tank/ Pipe Insulation</td>
<td>Hot Water Tank Pipe Insulation - ¾” (per cu foot)</td>
</tr>
<tr>
<td>13</td>
<td>Hot Water</td>
<td>Hot Water Tank/ Pipe Insulation</td>
<td>Hot Water Tank Insulation - Fiberglass R10</td>
</tr>
<tr>
<td>14</td>
<td>Hot Water</td>
<td>Efficient Shower Head/Faucet Aerator</td>
<td>Efficient Shower Head (standard) &lt; 4.8 L/min</td>
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<tr>
<td>15</td>
<td>Hot Water</td>
<td>Efficient Shower Head/Faucet Aerator</td>
<td>Efficient Shower Head (hand-held) &lt; 4.8 L/min</td>
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<tr>
<td>16</td>
<td>Hot Water</td>
<td>Efficient Shower Head/Faucet Aerator</td>
<td>Low-Flow Aerator (kitchen) &lt; 5.7 L/min</td>
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<tr>
<td>17</td>
<td>Hot Water</td>
<td>Efficient Shower Head/Faucet Aerator</td>
<td>Low-Flow Aerator (bathroom) &lt; 3.8 L/min</td>
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<tr>
<td>18</td>
<td>Refrigerator/Freezer</td>
<td>Refrigerator</td>
<td>Refrigerator Replacement (ENERGY STAR Qualified 15.5–16.9 cu ft)</td>
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<td>19</td>
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<td>Refrigerator</td>
<td>Refrigerator Replacement (ENERGY STAR Qualified 17.0–18.4 cu ft)</td>
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<td>20</td>
<td>Refrigerator/Freezer</td>
<td>Refrigerator</td>
<td>Refrigerator Replacement (10.0–12.5 cu feet)</td>
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<tr>
<td>21</td>
<td>Refrigerator/Freezer</td>
<td>Freezer</td>
<td>Freezer Replacement (ENERGY STAR Qualified 12.0–14.4 cu feet)</td>
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<tr>
<td>22</td>
<td>Refrigerator/Freezer</td>
<td>Freezer</td>
<td>Freezer Replacement (ENERGY STAR Qualified 14.5–16.0 cu feet)</td>
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<tr>
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<td>Air Conditioning</td>
<td>Window AC</td>
<td>Window Air Conditioner Replacement (ENERGY STAR qualified 6,000–7,999 BTU/hr)</td>
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<td>24</td>
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<td>Window AC</td>
<td>Window Air Conditioner Replacement (ENERGY STAR qualified 8,000–9,999 BTU/hr)</td>
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<td>25</td>
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<td>Window AC</td>
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<td>Dehumidifier</td>
<td>Dehumidifier Replacement (ENERGY STAR qualified 14.2–21.2 L/day)</td>
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<td>27</td>
<td>Air Conditioning</td>
<td>Dehumidifier</td>
<td>Dehumidifier Replacement (ENERGY STAR qualified 21.3–25.4 L/day)</td>
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<td>Dehumidifier</td>
<td>Dehumidifier Replacement (ENERGY STAR qualified 25.5–35.5 L/day)</td>
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<td>29</td>
<td>Programmable Thermostat</td>
<td>Programmable Thermostat</td>
<td>Programmable Thermostat – Line Voltage</td>
</tr>
<tr>
<td>30</td>
<td>Programmable Thermostat</td>
<td>Programmable Thermostat</td>
<td>Programmable Thermostat – Low Voltage</td>
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<td>31</td>
<td>Weatherization</td>
<td>Draft Proofing</td>
<td>Comprehensive Draft-Proofing</td>
</tr>
<tr>
<td>32</td>
<td>Weatherization</td>
<td>Insulation</td>
<td>Attic Insulation</td>
</tr>
<tr>
<td>33</td>
<td>Weatherization</td>
<td>Insulation</td>
<td>Wall Insulation</td>
</tr>
<tr>
<td>34</td>
<td>Weatherization</td>
<td>Insulation</td>
<td>Basement Insulation</td>
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### Appendix B. Verified Savings by Measure

<table>
<thead>
<tr>
<th>Measure Description</th>
<th>kW</th>
<th>kWh</th>
<th>Unique Participants</th>
<th>Measures Installed</th>
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<td>Attic Insulation (sq. ft.)</td>
<td>221</td>
<td>558,202</td>
<td>888</td>
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<td>Basement Insulation (sq. ft.)</td>
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<td>215,980</td>
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<td>512</td>
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<tr>
<td>Comprehensive Draft Proofing (sq. ft.)</td>
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<td>674,619</td>
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<td>Dehumidifier Replacement (ENERGY STAR Qualified 14.2 - 21.2 l/day)</td>
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<td>86,494</td>
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<td>Dehumidifier Replacement (ENERGY STAR Qualified 21.3 - 25.4 l/day)</td>
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<td>147</td>
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<td>Dehumidifier Replacement (ENERGY STAR Qualified 25.5 - 35.5 l/day)</td>
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<td>Efficient Aerators (Bathroom) &lt; 3.8 Lpm</td>
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<td>32,964</td>
<td>934</td>
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<td>Efficient Aerators (Kitchen) &lt; 5.7 Lpm</td>
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<td>90,941</td>
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<td>76,347</td>
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<td>ENERGY STAR Qualified CFL - PAR30 (75Ww)</td>
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<td>ENERGY STAR Qualified CFL - PAR38 (100W Outdoor)</td>
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<td>198</td>
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<td>13</td>
<td>256,543</td>
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<td>Hot Water Tank Insulation - Fibreglass R10</td>
<td>3</td>
<td>26,841</td>
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<td>149</td>
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<td>Hot Water Tank Pipe Insulation - 1/2 in (Per Foot)</td>
<td>13</td>
<td>105,349</td>
<td>1,578</td>
<td>7,680</td>
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<td>Hot Water Tank Pipe Insulation - 3/4 in (Per Foot)</td>
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<td>13,210</td>
<td>171</td>
<td>642</td>
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<tr>
<td>Power Bar With Integrated Timer</td>
<td>5</td>
<td>105,298</td>
<td>2,014</td>
<td>2,048</td>
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<tr>
<td>Programmable Thermostat - Line Voltage</td>
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<td>114,534</td>
<td>661</td>
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<tr>
<td>Programmable Thermostat - Low Voltage</td>
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<td>186,131</td>
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<td>124</td>
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<tr>
<td>Refrigerator Replacement (10.0 - 12.5 cu ft)</td>
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<td>869,086</td>
<td>1,148</td>
<td>1,149</td>
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<td>Refrigerator Replacement (ENERGY STAR Qualified 15.5 - 16.9 cu ft)</td>
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<td>723,027</td>
<td>831</td>
<td>831</td>
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<td>Refrigerator Replacement (ENERGY STAR Qualified 17.0 - 18.4 cu ft)</td>
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<td>2,321,244</td>
<td>2,485</td>
<td>2,497</td>
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<tr>
<td>Wall Insulation (sq. ft.)</td>
<td>32</td>
<td>82,220</td>
<td>15</td>
<td>15,966</td>
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<tr>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 10,000 - 12,000 BTU/hr)</td>
<td>10</td>
<td>9,367</td>
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<td>52</td>
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<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 6,000 - 7,999 BTU/hr)</td>
<td>22</td>
<td>20,990</td>
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<td>182</td>
</tr>
<tr>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 8,000 - 9,999 BTU/hr)</td>
<td>32</td>
<td>29,686</td>
<td>202</td>
<td>204</td>
</tr>
</tbody>
</table>
Appendix C. Program Manager Interview Guide

IESO Low Income Initiative

DRAFT Program Manager Interview Guide

January 2015

Purpose

This interview guide will be used to support the process evaluation of the IESO’s Home Assistance Program (HAP). The interviews will be conducted by Opinion Dynamics staff. We will complete 1 interview with the HAP Program Manager, identified by the IESO as the best resources of information regarding the Low Income Initiative.

These interviews will serve six primary purposes to:

1) Develop an understanding of all goals and delivery strategies used to gain participation and the staff and stakeholders’ perspective on the effectiveness of each strategy

2) Better understand participant outreach and education

3) Understand the training component requirements that may drive additional behavioral changes in 2014

4) Better understand the tracking systems, quality assurance procedures, and audit process and documentation; particularly for weatherization projects

5) Assess the level of cooperation between the LDCs and natural gas companies

6) Identify potential alternative program technologies and designs that could be tested through our research.

7) Understand how the structure and delivery strategies of the HAP will change moving forward?
Introduction

I would like to ask you some questions about your experience with the HAP, and allow you to raise any issues or concerns you might have regarding program operation or procedures. This information will help the IESO understand how the program may be improved.

2011-14 Evaluation Activities

- Analyzed deemed savings values for HAP measures responsible for at least 1% of the program’s energy savings;
- Calculated gross impacts using the updated deemed savings values for all program years to-date;
- Estimated and analyzed the net-to-gross ratio for the 2013 program year;
- Calculated cost effectiveness metrics for all program years; and
- Completed process evaluations for all program years, which included a detailed review of the program’s education and training component.

2015 Evaluation Objectives

- Verify gross energy savings and peak demand reductions achieved through the HAP;
- Build on research completed through previous evaluations to categorize the most effective attributes of the program’s educational component, and conduct an analysis to quantify any additional program enabled savings that may result;
- Review per-unit deemed savings values, and associated assumptions, for each HAP measure;
- Determine the reasons for lower in-service rates for some measures (e.g., appliances, faucet aerators) observed in the 2014 program year evaluation; and
- Identify barriers to LDCs and delivery agents undertaking more weatherization projects and explore differences between rates of weatherization projects among the LDCs.
Background

1) Has your role at the IESO changed at all over the past year?

2) Were there any changes to the HAP or ACP over the past year?
   a) We looked at the proposed business case for HAP moving forward, has that business case been finalized, or have there been any notable changes?
   b) Will there be any changes to the structure of the ACP moving forward, and, if so, will those changes mirror what is going on with the HAP?

3) Do you have any idea of what 2015 participation will look like?
   a) HAP (do you anticipate the percentage of HAP participants in social housing to decrease?)
   b) ACP

4) What do you think went well in 2015 for both programs?

5) Are there any major barriers that either program faced in 2015?
   a) In your opinion, will the changes to the programs slated for the future adequately address those barriers? (Why/Why not?)

Organization Relationships

6) I know that one of the changes to the HAP moving forward is geared towards building more effective partnerships with gas companies. Were any of those formal partnerships initiated in 2015?

7) Were there any major changes to other partners that the HAP has worked with in the past to deliver the program? (e.g. any new delivery agents that we may not be familiar with?)

Program Marketing/Outreach (Home Assistance Program (HAP))

8) Can you briefly describe again how the IESO supports LDC marketing efforts?

9) Were there any changes to how either the HAP or ACP were marketed in 2015?
   a) How will this change moving forward? Will the IESO provide assistance to any LDCs in marketing the program, or will marketing differ substantially by LDC?
   b) With the new structure moving forward, do you expect HydroOne to be more involved in the marketing (and administration) of the ACP, or will this still largely be handled by FNESL?

10) In the past we have discussed the large share of HAP participants that reside in social housing, and how this source of participation is becoming sparse. I know that one of the areas that the HAP will focus on moving forward are renters in privately owned housing, in part, to deal with this issue. How did the HAP deal with this issue in 2015?
Program Data Collection, Processing and Tracking

11) We have looked at the new version of the FAST and provided comments to the evaluation team at the IESO. One question that we couldn’t figure out from the tool was if collecting resident contact information was required. Are auditors required to collect some contact information for participants at the time of their energy assessment?

   a) Was this the case in 2015, or were some participants (probably in social housing) not required to fill out an application, or even provide sign-off to participate?

Conclusion

12) To your knowledge, have participants requested any different types of measures?

13) One of the things we are looking at this year is the why some LDCs seem more interested in installing weatherization measures, while others do not.

   a) Some LDCs that we have spoken to in the past say that there is very little opportunity to install insulation measures given what the program requires, while others in close proximity find homes that meet the criteria. In our opinion, what are the reasons for this disparity? (IF NEEDED: do you think that screening for these measures is cost prohibitive for some LDCs? Do you think there are major differences in the heating fuel-type and housing stock in different LDC service territories?)

14) Finally, are there any questions, for either the HAP or ACP, that would be useful for this evaluation to help answer?
Purpose

This interview guide will be used to support the process evaluation of the Low Income Initiative, also known as the Home Assistance Program (HAP). The interviews will be conducted by Opinion Dynamics staff primarily by telephone. We will complete 4-5 interviews with representatives from LDCs implementing the program that will vary by size, geography, and delivery agent.

These interviews will serve three primary purposes:

- To develop an understanding of any changes to the program’s delivery strategies, or goals from 2014 to 2015;
- To better understand the types of education that LDCs offered to participants in 2015; and
- To identify major barriers in offering the HAP in 2015, specifically for weatherization measures, and to capture stakeholder opinions on how the program can continue to improve in future years.

Background

Before we begin, I just want to clarify a few things. I understand that the HAP has undergone some changes starting this program year. This interview, and the evaluation that it will support, is concerned with the previous program year (2015). It is important that as we go through these questions, you try to think about how the program was previously designed and implemented, and provide feedback on the 2015 program year prior to the new CFF framework.

1. Our records show that you are currently the contact at <LDC> for the Low Income Initiative, or the Home Assistance Program. Is this correct? [IF NO, ASK TO BE CONNECTED TO CORRECT CONTACT PERSON/REQUEST CONTACT INFORMATION.]

[ASK 2-7 IF FIRST TIME INTERVIEWEE, ELSE SKIP]

2. What is your role at <LDC>?

3. About how many residential customers does <LDC> serve?

4. About how many of those residential customers in <LDC>’s territory are low income or would potentially be eligible for the HAP?

5. Are there any characteristics of this population that you think may be unique or different from most other LDCs?
6. Please tell me about your involvement and role with the HAP.

7. When did <LDC> begin to implement the Initiative?

8. [ASK IF ALREADY INTERVIEWED] Did your role change at <LDC> between 2014 and 2015?

9. Were there any barriers or challenges associated with implementing the HAP in 2015?

10. What types of information, materials, guidance, or tools did IESO provide to you to help implement the program in 2015?

11. Were there any other changes to how <LDC> administers or implements the HAP from 2014 to 2015 (prior to the new framework)?

Organization Relationships

12. What organizations were involved with implementing the program for <LDC> in 2015 and what are their specific roles? Have any of these changed? [IF YES] Why?

13. Did you work with any other organizations as part of the HAP to recruit participants in 2015? (IF NEEDED) For example, some LDCs partner with the Salvation Army or Ontario Works to reach out to potential groups of participants that would qualify for the HAP.
   a. [IF YES] What value, if any, did this/these organizations add in the recruitment process?

14. Did you engage with any gas utilities in 2015 to deliver the program?
   a. [IF YES] How effective was communication between the HAP program management staff and the gas company?

15. In general, how would you describe the communication between the various stakeholders involved in the HAP? For example, the IESO, <LDC>, implementation staff, and any other organizations that you worked with in 2015. [PROBE FOR SPECIFICS ABOUT HOW THEY COORDINATE WITH THE IESO AND DELIVERY AGENTS]

Program Marketing/Outreach

16. How did you recruit participants in 2015?
   a. What resources do use to recruit participants into the HAP?
   b. Was this any different than the years prior to 2015?

17. What types of outreach and targeting information were used?
   a. How was that information tracked and stored?
   b. Do you have materials or databases that we can review? What are they?

18. What are the most successful channels for generating participation in years past? How are these channels being used?
19. What percent of participants were in social housing in 2015? How do you see that changing this year, and in future years?

20. Did the IESO provide any kind of marketing materials or support in 2015?

Program Application and Measure Eligibility

21. Can you describe the application process in 2015? [PROBE IF NEEDED] Which forms did participants have to fill out in addition to what is entered into the FAST?

22. Can you describe the <DELIVERY AGENT>‘s use of the FAST in 2015?
   a. How are updates to the FAST (i.e. the newest version) disseminated to <DELIVERY AGENT>? Is there a process in place to ensure that auditors are using the latest version?
   b. How well of a job did you feel the FAST does in identifying cost effective measures and estimating savings in 2015? Why?

23. [IF NO/FEW Wx MEASURES PROVIDED] Did <LDC> attempt to pursue weatherization measures in 2015?
   a. [IF NO] Why not?
   b. [IF YES] Considering the design of the 2015 program, what were some of the major barriers to offering weatherization measures?
      i. How much opportunity is there for weatherization measures among the current pool of program participants?
      ii. Were auditors generally trained to identify weatherization opportunities?
      iii. What would help to identify and pursue more opportunities for weatherization measures?

24. [IF MANY Wx MEASURES PROVIDED] How did <LDC> approach identifying and pursuing weatherization opportunities in 2015? How did this approach differ from that of other types of measures?
   a. What portion of participating homes that qualify for weatherization measures do you think are actually receiving them?
   b. Does someone at <LDC> or <DELIVERY AGENT> do the modeling of weatherization savings in HOT2000?
   c. Do you have any advice for other LDCs that had a harder time implementing weatherization measures? Is there anything you think the program could do to enable more LDCs to pursue these measures?
Participant Experience

25. Did you require that <DELIVERY AGENT> auditors provide training and education to participants on actions they could take to save energy in 2015?

26. Were there guidelines or training on what information could and should have been provided to participants? Were there any specific recommendations that auditors were instructed to provide, as far as changes participants can make to their everyday behavior that may lead to additional energy savings? [PROBE FOR SPECIFIC BEHAVIOR CHANGES]

27. To the best of your knowledge, did auditors typically customize the type of recommendations they provided to participants? If so, how?

28. In 2015, what percent of the time do you think auditors were actually able to provide the training and education as directed?

29. Other than participants’ willing to engage with auditors, have auditors described any other barriers in terms of providing these recommendations to participants?

LDC Participation in Program

30. Did <LDC> have specific goals for participation in the HAP in 2015? Were those goals met? How were they determined?
   a. What are the primary energy and non-energy goals of the Initiative?
   b. What are the main challenges for <LDC> in attaining these goals?

31. Finally, do you have any other comments or recommendations concerning the past program year of the HAP that you would like to share?
Purpose

This interview guide will be used to support the process evaluation of the Low Income Initiative, also known as the Home Assistance Program. The interviews will be conducted by telephone by Opinion Dynamics staff. We will complete in-depth interviews with delivery agent managers implementing the program.

These interviews will serve four primary purposes:

(1) to develop an understanding of goals and delivery strategies used to gain participation and the staff and stakeholders' perspective on the effectiveness of each strategy

(2) to better understand the implementation and effectiveness of participant outreach and education component of the Initiative

(3) to better understand the flow of tracking data, quality assurance procedures, and audit process and documentation

(4) to identify potential alternative program offerings and implementation strategies

Background

S1. Our records show that you are currently the contact at [DELIVERY AGENT] for the Home Assistance Program. Is this correct?

[IF S1 = NO, COLLECT CONTACT INFORMATION FOR THE CORRECT PERSON.]

[ASK B1-B8 IF FIRST TIME INTERVIEWEE, ELSE SKIP]

B1. What is your role at [DELIVERY AGENT] and your involvement with the Home Assistance Program?

B2. About how many LDCs have you contracted with to provide the Home Assistance Program?

B3. Are your contracts with each LDC different? What are the biggest difference?

B4. Can you describe the working relationship between [DELIVERY AGENT] and LDCs?
   B4a. What are your respective roles in implementing the programs?
   B4b. What is working?
   B4c. What is not working?
B5. What changes do you foresee affecting your work as the program is restructured in the coming year?

B6. Were there any barriers or challenges associated with implementation of the Program? Do any of these challenges vary depending upon the LDC you are serving?

B7. What types of information, materials, guidance, or tools have the LDCs provided to you to help implement the program?

**Organization Relationships**

[ASK IF FIRST TIME INTERVIEWEE, ELSE SKIP TO R3]

R1. Other than the LDCs and IESO, do you work with any other organizations as part of the Home Assistance Program? What are their roles? [PROBE FOR MARKETING ORGANIZATIONS, OUTREACH ORGANIZATIONS, ETC.]

R2. Have you worked with the gas utilities to deliver the Home Assistance Program?
   R2a. How effective is communication and coordination between program implementation staff and participating organizations and stakeholders, such as the natural gas companies?
   R2b. What are the primary areas for improvement?

[GO TO NEXT SECTION IF FIRST TIME INTERVIEWEE]

R3. Have you started working with any additional organizations over the past year to assist with recruitment and outreach, or for any other reason? Do you have plans to build working relationships with any organizations moving forward?

**Program Marketing/Outreach**

M1. Is [DELIVERY AGENT] involved in participant recruitment? [IF YES, CONTINUE TO M2. IF NO, SKIP TO D1]

M2. How do you recruit participants?

M3. Do you have a marketing approach or plan in mind for the program? If so, please describe.
   M3a. Does your marketing approach differ by LDC?

M4. What types of outreach and targeting information are used? How is that information tracked and stored? Do you have materials or databases that we can review?

M5. What are the most successful channels for generating participation?

M6. What % of participants were in social housing in 2015? How do you see that changing in the coming years?

M7. Do the LDCs provided any kind of marketing materials or support? [IF YES] Are you able to share these materials with us?
M6a. Does IESO provide any marketing materials? [IF YES] Are you able to share these materials with us?

M8. Is there any support you would like to receive from either the IESO or the LDCs related to marketing and outreach?

M9. How is your marketing budget determined?

Program Data Collection, Processing and Tracking

D1. Is the information from the program application entered into a database?

D1a. How is the information transferred between the LDCs and [DELIVERY AGENT]?

D2. Can you describe [DELIVERY AGENT]’s use of the Field Audit Support Tool (FAST)?

D2a. How are updates to the FAST (i.e. the newest version) disseminated to you from LDCs? Is there a process in place to ensure that auditors are using the latest version?

D2b. How well of a job do you feel the FAST does in identifying cost effective measures and estimating savings? Why?

D2c. Other than identifying eligible measures, forecasting electricity and demand savings, and developing billing reports, how else does [LDC] use the FAST results?

D2d. Are there any changes you would make to the FAST tool?

D3. Does [DELIVERY AGENT] offer weatherization measures to qualifying participants?

D4. Describe the Extended Audits and the information collected.

D4a. What data collection tools are used? How are auditors trained on these conducting these audits and using the tools?

D4b. How is the Field Audit Support Tool used for weatherization measures?

D4c. Are the weatherization savings estimated using the HOT2000 model? Who does this modeling?

D4d. Does [DELIVERY AGENT] do any QA/QC on the model results?

D4e. Where are the modeling files maintained and how are these data transferred to the LDCs? How does this process, if at all, differ from basic audits?

D4f. Is the information from the HOT2000 model entered into the FAST?

D4g. Are the models and FAST updated for this project following the post-weatherization verification audit, if necessary?

D4h. How do you feel the HOT2000 model does in terms of estimating weatherization savings? [PROBE FOR REASONS WHY THEY FEEL THIS WAY]

D4i. In general, what do you think about how FAST handles weatherization measures?
D5. Are any other data collection instruments used during the audits? If so, what information is collected and how is it used and where is it maintained?

D6. Describe the verification process.
   D6a. When are verification audits conducted? By whom?
   D6b. What information is collected during the verification audits?
      D6bi. Is this process different depending on which measures are installed (i.e. is there a different process for verifying weatherization measures)?
   D6c. What forms are used? Can we review examples of completed forms?

D7. Describe the reimbursement process.
   D7a. How does [DELIVERY AGENT] submit requests for reimbursement of measures to the LDCs?
   D7b. How do the LDCs provide reimbursement for outreach and marketing?

Participant Experience

E1. Do you require that auditors provide training and education on things they can do to save energy?

E2. Are there guidelines on what information can and should be provided? Are there any specific recommendations that auditors are instructed to provide, as far as changes participants can make to their every-day behavior that may lead to additional energy savings? [PROBE FOR SPECIFIC BEHAVIOR CHANGES]

E3. Do auditors customize the type of recommendations they provide to participants? If so, how?

E4. What % of the time do you think auditors are actually able to provide the training and education as directed?

E4. Other than having participants willing to engage with auditors, are there any other major barriers that auditors have described in terms of provided these recommendations to participants?

E5. Are auditors trained in participant engagement?

E6. Are there materials that are left with the participants after the audit? Do auditors spend time reviewing these materials with participants?

E7. Are you able to provide these materials to us?

E8. How is participant engagement verified? Does [DELIVERY AGENT] use any sort of follow-up customer satisfaction survey

E9. Has [LDC] received any positive or negative feedback from participants on the program or their interactions with field staff?

E10. Has there been any request for additional measure types? Specify. Are any additional measures or incentives being considered, or a restructuring of existing ones?
Delivery Agent Participation in Program

L1. Does [DELIVERY AGENT] have specific goals for participation levels in the HAP for each LDC?

L1a. How are these goals determined? Do you expect these to change moving forward?

L1b. What were the primary energy and non-energy goals of the Initiative in 2015?

L1c. Are you on track to meet the 2016 goals?

L1d. What are the main challenges for [DELIVERY AGENT] in attaining these goals?

L1e. Are there any aspects of the program that you feel are unnecessarily burdensome on you? Auditors? Participants?

L2. Finally, do you have any other comments or recommendations concerning the HAP that you would like to share?
Appendix F. Participant Survey

IESO
Low Income Initiative/Home Assistance Program
Participant Survey
FINAL
April 2016

SAMPLE FIELDS
NAME: Customer name
LDC: Local distribution company
MEAS: The measure the customer received, per the program tracking data
QTY_A-L: Quantity listed in the program tracking data specific to each measure

Introduction
Hello, my name is __________ from Opinion Dynamics, an independent research company, and I’m calling on behalf of the Independent Electricity System Operator. We’re speaking with <LDC> customers who have participated in the Home Assistance Program to learn about their experience and satisfaction with the program.

This is not a sales call, and all of your responses will be kept confidential. May I please speak with <NAME> or whoever in your household is the most familiar with the free upgrades you received from <LDC> during a recent energy audit? [IF NEEDED: During this audit a contractor would have come into your home, installed free upgrades, such as CFL light bulbs, and talked to you about ways to save energy.]

[IF THE person WHO RECEIVED THE AUDIT IS NO LONGER THERE, THANK AND TERMINATE]. Is now a convenient time to speak with you? [IF NEEDED: THIS SURVEY USUALLY TAKES ABOUT 15 MINUTES.] [IF NO, SCHEDULE A CALLBACK TIME.]

Screener
C1. Are you currently talking to me on a regular landline phone or a cell phone?
1. (Regular landline phone)
2. (Cell Phone)
8. (Don’t know)
9. (Refused)
Appendix F. Participant Survey

[ASK IF C1 = 2, 8, 9; ELSE GO TO CV1]
C2. Are you currently in a place where you can talk safely and answer my questions?
   1. (Yes)
   2. (No) [Schedule call back]
   8. (Don’t know) [Schedule call back]
   9. (Refused) [Schedule call back]

Customer Verification

CV1. According to our records, your household received a free energy efficiency audit through the Home Assistance Program, where one or two program representatives assessed your home’s energy use, talked to you about ways to save energy, and gave you certain energy saving products to help you save energy in your home. Is that correct?
   1. (Yes)
   2. (No)
   3. (No, I’m the Property Manager, Building Manager, or Landlord) [THANK AND TERMINATE]
   8. (Don’t know)
   9. (Refused) [THANK AND TERMINATE]

[ASK IF CV1 = 2 OR 8]
CV2. Is it possible that someone else in your home was present when the Home Assistance Program representatives installed the energy saving products?
   1. (Yes) [THANK AND TERMINATE]
   2. (No) [THANK AND TERMINATE]
   8. (Don’t know) [THANK AND TERMINATE]
   9. (Refused) [THANK AND TERMINATE]

[ASK IF CV2 = 1]
CV3. Is that person available at this time to speak about the energy efficiency upgrades that were installed?
   1. (Yes) [IF YES, ASK TO SPEAK TO THAT PERSON]
   2. (No) [IF NO, ASK FOR NAME/PHONE OF THAT CONTACT, SCHEDULE CALLBACK]
   8. (Don’t know) [THANK AND TERMINATE]
   9. (Refused) [THANK AND TERMINATE]

Program Participation

First, I would like to ask you about your participation in the program.
P1. In which of the following ways did you hear about the program? [MULTIPLE RESPONSE; UP TO 3, READ EACH]
   01. <LDC>’s website
   02. A telephone call from program staff
   03. A community event or seminar
   04. My landlord, building superintendent, or building manager
   05. Someone coming to your door
   06. A program flyer or any other printed material
   07. A friend or family member told you
   00. (Other, specify)
   98. (Don’t know)
   99. (Refused)
Appendix F
Participant Survey

P2. Which of the following best describes how you signed up for the program? [READ EACH]

01. You filled out a paper application
02. You signed up at an event or presentation
03. You signed up online
04. A program staff member visited your home
05. Your landlord, building manager, or building superintendent signed you up
00. (Other – specify)
98. (Don’t know)
99. (Refused)

Measure Verification

[CFL DESCRIPTION: Compact fluorescent light bulbs, or CFLs usually do not look like regular incandescent light bulbs. The most common type of CFL is made with a glass tube bent into a spiral, resembling soft-serve ice cream, and fits in a regular light bulb socket.]

[FAUCET AERATOR/SHOWERHEAD DESCRIPTION: Faucet aerators are small devices that fit on the end of a sink faucet. Efficient showerheads replace less efficient showerheads. Both devices change the flow-rate of water to help reduce the amount of water and energy used in your home.]

[DEHUMIDIFIER DESCRIPTION: A dehumidifier is a piece of equipment that plugs into the wall and removes moisture from the air. It typically has a tank that gets filled with water and will need to be emptied periodically.]

[PROGRAMMABLE THERMOSTAT DESCRIPTION: The Home Assistance Program sometimes provides digital thermostats that can be programmed to adjust the temperature in your home automatically throughout the day. These devices are usually small, will have a digital display, and will replace an older traditional dial thermostat.]

[POWER BAR DESCRIPTION: The Home Assistance Program may offer a timer-controlled power bar that has four timer-controlled outlets and four switch controlled outlets. Whatever is plugged into an outlet controlled by the timer will be turned off when the timer is set to go off.]

[BLOCK HEATER TIMER DESCRIPTION: The Home Assistance Program may offer a timer-controlled block heater for warming your car engine in extremely cold weather.]

[WINDOW AC DESCRIPTION: A window air conditioning unit usually sits in an open window in the summer months and typically can cool a single room or a small space.]

[REFRIGERATOR/FREEZER DESCRIPTION: The Home Assistance Program may offer an efficient refrigerator and/or freezer, in place of an existing less efficient model.]

[HOT WATER TANK OR PIPE WRAP DESCRIPTION: The Home Assistance Program offers insulation for your hot water tank and the pipes that move hot water to the rest of your home.]

[INSULATION OR AIR SEALING DESCRIPTION: The Home Assistance Program sometimes provides additional insulation, which is typically installed in either the basement or the attic. Also, the program sometimes helps limit the draftiness of a home by sealing holes and cracks.]
Measure Delivery

V1. Now I would like to ask you some questions about the free energy efficiency upgrades that the program representative installed in your home. To start, I’d like to confirm some information in the <LDC>’s database. Our records show you received the following. Is this correct? [ROTATE]

a. [ASK IF QTY_A>0] <QTY_A> CFL(s)
   [1=YES, 2=Yes, different number, 3=NO, none, 8=DON'T KNOW, 9=REFUSED]

b. [ASK IF QTY_C>0] <QTY_C> faucet aerator(s) or efficient showerhead(s)
   [1=YES, 2=Yes, different number, 3=NO, none, 8=DON'T KNOW, 9=REFUSED]

c. [ASK IF QTY_D>0] <QTY_D> dehumidifier(s)
   [1=YES, 2=Yes, different number, 3=NO, none, 8=DON'T KNOW, 9=REFUSED]

d. [ASK IF QTY_E>0] <QTY_E> programmable thermostat(s)
   [1=YES, 2=Yes, different number, 3=NO, none, 8=DON'T KNOW, 9=REFUSED]

e. [ASK IF QTY_F>0] <QTY_F> power bar(s)
   [1=YES, 2=Yes, different number, 3=NO, none, 8=DON'T KNOW, 9=REFUSED]

f. [ASK IF QTY_G>0] A block heater timer
   [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]

g. [ASK IF QTY_H>0] A window air conditioning unit
   [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]

h. [ASK IF QTY_I>0] A refrigerator and/or freezer
   [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]

i. [ASK IF QTY_K>0] Hot water tank or pipe wrap
   [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]

j. [ASK IF QTY_L>0] Insulation or air sealing
   [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]

[For each V1X=3 (measures A to F), 2 (measures G to L), 8]:

V2X. You said you [IF V1X=3 (A-F), 2 (G-L) “didn’t receive <MEAS>”, IF V1X=8, “don’t know if you received <MEAS>”]. [READ MEAS DESCRIPTION]. Does that sound like something that you received through the Home Assistance Program?
   1. (Yes)
   2. (No)
   8. (Don’t know)
   9. (Refused)

[For each V1X=2 or V2X=1 (measures A to F)]:

V3X How many <MEAS> did you receive?
   [NUMERIC 1-100]
   8. (Don’t know)
   9. (Refused)

For each measure X (measures A to F):
GEN V_QTY_X=QTY_X IF V1X=1
GEN V_QTY_X=V3X IF V3X=1-100
OTHERWISE SET V_QTY_X=0

For each measure X (measures G to L):
GEN V_QTY_X = 1 IF V1X=1 OR V2X=1
OTHERWISE SET V_QTY_X=0
[THANK AND TERMINATE IF ALL V_QTY_X = 0]

Measure Installation (Program Rep)

[For each measure X (measures A to H)]:
[ASK V4X IF V_QTY_X > 0]

V4X. Did the program representative install the <V_QTY_X> <MEAS>(s) you received through the program?
1. (Yes – All)
2. (Yes – Some)
3. (No – None)
8. (Don’t know)
9. (Refused)

[For each measure X (measures A to H)]:
[ASK IF V4X=2]

V5X. How many of the <V_QTY_X> <MEAS>(s) did the program representative install? [DO NOT ALLOW ZERO; INSTEAD, RETURN TO V4X AND SELECT NONE]
[NUMERIC 1 - V_QTY_X]
998. (Don’t know)
999. (Refused)

GEN PROG_QTY_X = V_QTY_X IF V4X = 1
GEN PROG_QTY_X = V5X IF V5X = 1-100
OTHERWISE SET PROG_QTY_X = 0

GEN REM_QTY_X = V_QTY_X – PROG_QTY_X

Measure Installation (Self)

[For each measure X (measures A to H)]:
[ASK IF V4X=2,3,8,9]

V6X. Did you or someone else in your home install the [READ IF V4X=2: “remaining”] <REM_QTY_X> <MEAS>(s) you received through the program?
1. (Yes – All)
2. (Yes – Some)
3. (No – None)
8. (Don’t know)
9. (Refused)

[ASK IF V6X=2]

V7X. How many of the <MEAS>(s) did you (or they) install? [DO NOT ALLOW ZERO; INSTEAD, RETURN TO V6X AND SELECT NONE]
[ NUMERIC OPEN END 1 - <REM_QTY_X>]
998. Don’t know
999. Refused

GEN SELF_QTY_X = REM_QTY_X IF V6X = 1
GEN SELF_QTY_X = V7X IF V7X = 1-100
OTHERWISE SET SELF_QTY_X = 0
GEN INST_QTY_X = PROG_QTY_X + SELF_QTY_X

[For each measure E,G if INST_QTY_X>0]
V8X. [IF INST_QTY_X > 1 READ: “Have”) [IF INST_QTY_X = 1 READ: “Has”) the <MEAS> been programmed? [IF NEEDED, “by program, I mean did you set up your <MEAS> to automatically adjust at different times of the day and night]
   1. (Yes)
   2. (No)
   8 (Don’t know)
   9. (Refused)

Measure Persistence

[For each measure X (measures A,C,E,F)):
[ASK V9X IF INST_QTY_X > 0]
V9X. [IF INST_QTY_X=1 READ: “Is the <MEAS>”] [IF INST_QTY_X>1, “Are the <MEAS>s”] you received through the program still installed?
   1. (Yes – All)
   2. (Yes – Some)
   3. (No – None)
   8 (Don’t know)
   9. (Refused)

[ASK IF V9X=2]
V10X. How many of the <MEAS>s are still installed?
   [NUMERIC 1 - INST_QTY_X]
   998. Don’t know
   999. Refused

GEN CUR_INST_X = INST_QTY_X IF V9X=1
GEN CUR_INST_X = 0 IF V9X=3
GEN CUR_INST_X = V10X IF V10X=1 -100

[ASK IF V9X=2,3]
V11X. Why did you decide to remove the [MEAS] you received through the program?
   [OPEN ENDED RESPONSE]

Measure Satisfaction

V12X. On a scale from 1 to 7, where 1 is “extremely dissatisfied” and 7 is “extremely satisfied”, how would you rate your overall satisfaction with the <MEAS> you received? [1-7, 8=DON'T KNOW, 9=REFUSED]

[ASK IF V12X=1,2,6,7]
V13X. Why did you give this rating?
   00. [OPEN END]
   98. (Don’t know)
   99. (Refused)
Behavior Change

B1. Which of the following devices do you have in your home?
   A. A television? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]
   B. A computer? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]
   C. A dishwasher? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]
   D. A clothes washer? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]
   E. An electric clothes dryer? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]
   F. An electric hot water heater? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]

[IF ALL B1A-F=2,8,9, SKIP TO B7]

B2. Many appliances and devices like the ones I just mentioned may have energy saving settings on them that can be manually activated. Since participating in the program, have you or has someone in your household activated energy savings settings on any of your appliances? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]

[ASK IF B2 = 1]

B2A. Just to confirm, did you activate those energy-saving settings AFTER participating in the program? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]

B3. Did you...?
   [ASK IF B1A=1 & B2A=1]
   A. Turn on your energy-saving setting on your TV? [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]
   [ASK IF B1B =1 & B2A=1]
   B. Turn your computer on “power-saving mode”? [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]
   [ASK IF B1C =1 & B2A=1]
   C. Turn off the “heated dry” setting on your dishwasher? [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]
   [ASK IF B1D=1 & B2A=1]
   D. Regularly wash your clothes in cold water? [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]
   [ASK IF B1E=1 & B2A=1]
   E. Regularly air-dry clothing? [1 = YES, 2 = NO, 8 = DON'T KNOW, 9 = REFUSED]
   [ASK IF B1F=1 & B2A=1]
   F. Turn the temperature down on your hot water tank? [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]
   [ASK IF B2A=1]
   G. Activate energy-saving settings on any other appliances? [1=YES, 2=NO, 8=DON'T KNOW, 9=REFUSED]

[ASK IF B3G=1]

B4. What other appliances did you activate energy-saving settings on? [OPEN END]

[ASK IF B2A = 1]

B5. On a scale from 1 to 7, where 1 is “not influential at all” and 7 is “extremely influential” how would you rate the influence of the program on your decision to activate those energy savings settings? [IF NEEDED: PLEASE CONSIDER ALL OF THE ENERGY SAVINGS SETTINGS YOU JUST MENTIONED] [1-7, 8=DON'T KNOW, 9=REFUSED]

[ASK IF B2A = 1]

B6. On a scale from 1 to 7, where 1 is “not at all likely” and 7 is “extremely likely” what is the likelihood that you would activate those energy savings settings had the program not been available to you? [IF
NEEDED: PLEASE CONSIDER ALL OF THE ENERGY SAVINGS SETTINGS YOU JUST MENTIONED [1-7, 8=DON’T KNOW, 9=REFUSED]

B7. Since participating in the program, have you or has someone in your household taken any other energy saving actions that we have not yet discussed? [1 = YES, 2 = NO, 8 = DON’T KNOW, 9 = REFUSED]

[ASK IF B7 = 1]
B7A. What other actions have you taken to save energy in your home? [OPEN END]

[ASK IF B7 = 1]
B7B. Did you take any of those actions BEFORE participating in the program? [1 = YES, 2 = NO, 8 = DON’T KNOW, 9 = REFUSED]

[ASK IF B7B = 2]
B7C. On a scale from 1 to 7, where 1 is “not influential at all” and 7 is “extremely influential” how would you rate the influence of the program on your decision to take additional energy-saving actions? [1-7, 8=DON’T KNOW, 9=REFUSED]

[ASK IF B7B = 2]
B7D. On a scale from 1 to 7, where 1 is “not at all likely” and 7 is extremely likely” what is the likelihood that you would have taken those additional energy-saving actions had the program not been available to you? [1-7, 8=DON’T KNOW, 9=REFUSED]

Non-Energy Benefits

[ASK IF V_QTY_E, H, OR L > 0]
NE1. Since the free upgrades were made to your home, would you say keeping a comfortable temperature in your home is...
   1. Easier
   2. Harder, or
   3. The same as before the upgrades were installed
   8. (Don’t know)
   9. (Refused)

NE2. In terms of the hydro that you use in your home, which of the following statements is more accurate:
   01. You or someone in your household is responsible for paying the hydro bill
   02. The cost of the hydro that you use is included in your rent or other fees
   00. Other (Specify)
   98. (Don’t know)
   99. (Refused)

[ASK IF NE2 = 2]
NE2A. Who pays the hydro bill? [OPEN END, RECORD RESPONSE]

[ASK IF NE2 = 1,2]
NE2B. Which of the following sentences best describes how your HYDRO bill has changed because of the free upgrades installed during your home energy audit? [WE’RE ONLY INTERESTED IN HYDRO BILL, NOT GAS OR OTHER TYPES OF ENERGY]
   1. Your hydro bill has stayed the same
2. Your hydro bill has gone down
3. Your hydro bill has gone up
8. (Don’t know)
9. (Refused)

NE3. I am now going to read a list of some other potential benefits you may have noticed since participating in the program. Tell me which of the following are true... [ROTATE, Yes=1, NO=2, 8=Don’t Know, 9= Refused]
   a) I like the light level in my home better
   b) I feel like I am doing something good for the environment
   c) [ASK IF V_QTY_L>0] My home is less drafty
   d) [ASK IF V_QTY_L>0] My home is quieter, I hear less noise from the outside
   e) I have fewer maintenance costs
   f) [FIXED POSITION] Are there any other benefits you have noticed [OPEN END]

[ASK IF ANY NE3a-f =1 OR NE1=1 OR NE2B=2]

NE6. Have you talked about any of these benefits with friends, family, or coworkers?
   1. (Yes)
   2. (No)
   8. (Don’t know)
   9. (Refused)

Demographics

We’re almost finished. I just have a few questions about your household for our analysis. All of your information will be kept confidential.

D1. Do you or someone in your household own this home or do you rent?
   1. Own
   2. Rent
   3. (Other – Specify)
   8. (Don’t know)
   9. (Refused)

D2. What type of residence do you live in? (LIST CATEGORIES)
   1. Single-family
   2. Duplex or two-family
   3. Apartment/condo in a 2-4 unit building
   4. Apartment/condo in a >4 unit building
   5. Townhouse or row house (adjacent walls to another house)
   6. Mobile home, house trailer
   7. (Other, please specify)

D3. Approximately, when was this home first built? (READ LIST IF NEEDED)
   01. (Before 1950)
   02. (Between 1950 and 1959)
   03. (Between 1960 and 1969)
   04. (Between 1970 and 1978)
   05. (Between 1979 and 1988)
06. (Between 1989 and 2001)
07. (Between 2002 and 2007)
08. (2008 or later)
98. (Don’t Know)
99. (Refused)

D5. What type of fuel do you use primarily to heat your home? (IF NEEDED: Read list)
1. (Natural gas)
2. (Bottled, tank or LP gas)
3. (Hydro / Electricity)
4. (Oil, kerosene)
5. (Coal (coke))
6. (Wood)
7. (Solar)
00. (Other, specify)
96. (No fuel)
98. (Don’t know)
99. (Refused)

D6. What type of fuel do you use to heat water in your home? (IF NEEDED: Read list)
1. (Natural gas)
2. (Bottled, tank or LP gas)
3. (Hydro / Electricity)
4. (Oil, kerosene)
5. (Solar)
00. (Other, specify)
96. (No fuel)
98. (Don’t know)
99. (Refused)

D8. Do you have a Central Air Conditioning System? [1=YES, 2=NO, 98 = DON’T KNOW, 99 = REFUSED]

D9. How many bathrooms do you have in your home? [NUMERIC 1-10, 98 = DON’T KNOW, 99 = REFUSED]

D10. How many showers do you have in your home? [NUMERIC 1-10, 98 = DON’T KNOW, 99 = REFUSED]

D11. How many kitchen faucets do you have in your home? [NUMERIC 1-10, 98 = DON’T KNOW, 99 = REFUSED]

D12. Including yourself, how many people currently live in your home year-round? [RECORD NUMBER OF PEOPLE]
98. (Don’t know)
99. (Refused)

D13. How long have you lived in this home?
1. Less than 1 year
2. 1-3 years
3. 4-10 years
4. 11-20 years
5. More than 20 years
8. (Don’t know)
9. (Refused)
# Appendix G. Savings Assumptions

<table>
<thead>
<tr>
<th>#</th>
<th>Measure Description</th>
<th>Ex Post Per-unit Savings</th>
<th>Ex Ante Per-unit Savings</th>
<th>Realization Rate</th>
<th>Differences in Savings</th>
</tr>
</thead>
</table>
| 1  | ENERGY STAR Qualified CFL Twister (60W) | 46.14 kWh/Unit, 0.002 kW/Unit | 46.00 kWh/Unit, 0.002 kW/Unit | 100% 100%   | • No adjustment applied  
• Slight differences due to rounding                                                        |
| 2  | ENERGY STAR Qualified CFL Twister (75W) | 41.04 kWh/Unit, 0.002 kW/Unit | 54.00 kWh/Unit, 0.003 kW/Unit | 76% 76%   | • Ex ante assumptions unknown  
• Differences may be due to variations in assumed mix of halogen and incandescent baseline wattages |
| 3  | ENERGY STAR Qualified CFL Twister (100W) | 57.14 kWh/Unit, 0.003 kW/Unit | 74.00 kWh/Unit, 0.004 kW/Unit | 77% 77%   |                                                                                         |
| 4  | ENERGY STAR Qualified CFL Tri-Light (60-75-100W) | 89.60 kWh/Unit, 0.005 kW/Unit | 94.00 kWh/Unit, 0.005 kW/Unit | 95% 95%   | • Ex ante assumptions unknown                                                             |
| 5  | ENERGY STAR Qualified CFL-PAR30 (75W Outdoor) | 74.02 kWh/Unit, - kW/Unit | 74.00 kWh/Unit, - kW/Unit | 100% N/A |                                                                                         |
| 6  | ENERGY STAR Qualified CFL-PAR38 (100W Indoor) | 100.92 kWh/Unit, 0.005 kW/Unit | 101.00 kWh/Unit, 0.005 kW/Unit | 100% 100% | • No adjustment applied  
• Slight differences due to rounding                                                        |
| 7  | ENERGY STAR Qualified CFL-PAR38 (100W Outdoor) | 105.34 kWh/Unit, - kW/Unit | 105.00 kWh/Unit, - kW/Unit | 100% N/A |                                                                                         |
| 8  | ENERGY STAR Qualified CFL-Covered A19 (60W) | 46.14 kWh/Unit, 0.002 kW/Unit | 44.00 kWh/Unit, 0.002 kW/Unit | 105% 105% | • Ex ante assumptions unknown  
• Differences may be due to variations in assumed mix of halogen and incandescent baseline wattages |
| 9  | Block Heater Timer (Just Timer) | 266.15 kWh/Unit, - kW/Unit | 653.00 kWh/Unit, - kW/Unit | 41% N/A | • Changed assumed average wattage from 1,500W to 500W. This decreases ex post savings  
• Updated annual usage from 90 days/year to 106 days/year (number of days where temperatures fell below freezing). This increases ex post savings |
## Appendix G: Savings Assumptions

<table>
<thead>
<tr>
<th>#</th>
<th>Measure Description</th>
<th>Ex Post Per-unit Savings kWh/Unit</th>
<th>kW/Unit</th>
<th>Ex Ante Per-unit Savings kWh/Unit</th>
<th>kW/Unit</th>
<th>Realization Rate</th>
<th>Differences in Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Power Bar With Integrated Timer</td>
<td>81.27</td>
<td>0.004</td>
<td>53.00</td>
<td>0.002</td>
<td>153%</td>
<td>153%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Ex ante assumptions unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Used average of deemed savings assumptions from 10 different TRMs</td>
</tr>
<tr>
<td>11</td>
<td>Hot Water Tank Pipe Insulation - ½” (Per Linear Foot)</td>
<td>13.72</td>
<td>0.002</td>
<td>38.00</td>
<td>0.005</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Ex ante is provided in units of per 3 feet (per meter) whereas ex post is provided in units of linear foot (the kWh RR is 1.08 and 1.62 for 1/2” and 3/4”, respectively, when ex ante and ex post are compared in like units).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Ex post uses ASHRAE Fundamentals and assumptions from the Illinois TRM to estimate savings.</td>
</tr>
<tr>
<td>12</td>
<td>Hot Water Tank Pipe Insulation - ¾” (Per Linear Foot)</td>
<td>20.58</td>
<td>0.002</td>
<td>38.00</td>
<td>0.005</td>
<td>54%</td>
<td>54%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Unable to identify variables contributing to differences in savings as two different methods were used between ex ante and ex post.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Used the method outlined in the Illinois TRM.</td>
</tr>
<tr>
<td>13</td>
<td>Hot Water Tank Blanket - Fiberglass R10 (Per Tank)</td>
<td>180.14</td>
<td>0.022</td>
<td>270.00</td>
<td>0.033</td>
<td>67%</td>
<td>66%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Ex ante assumptions unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Used PY2015 participant survey data to update the number of showerheads per household and percentage of participants with electric water heating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Used metering study data to update usage rate and mixed water temperature</td>
</tr>
<tr>
<td>14</td>
<td>Efficient Showerheads (Standard) &lt; 4.8 Lpm</td>
<td>194.63</td>
<td>0.024</td>
<td>377.00</td>
<td>0.046</td>
<td>52%</td>
<td>52%</td>
</tr>
<tr>
<td>15</td>
<td>Efficient Showerhead (handheld) &lt; 4.8 Lpm</td>
<td>194.63</td>
<td>0.024</td>
<td>377.00</td>
<td>0.046</td>
<td>52%</td>
<td>52%</td>
</tr>
<tr>
<td>16</td>
<td>Efficient Aerators (Kitchen) &lt; 5.7 Lpm</td>
<td>80.07</td>
<td>0.010</td>
<td>140.00</td>
<td>0.017</td>
<td>57%</td>
<td>57%</td>
</tr>
</tbody>
</table>
### Appendix G. Savings Assumptions

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<thead>
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<th>Differences in Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Efficient Aerators (Bathroom) &lt; 3.8 Lpm</td>
<td>42.06 kWh/Unit 0.005 kW/Unit</td>
<td>79.94 kWh/Unit 0.010 kW/Unit</td>
<td>53% 53%</td>
<td>household and percentage of participants with electric water heating • Used metering study data to update usage rate and mixed water temperature</td>
</tr>
<tr>
<td>18</td>
<td>Refrigerator Replacement (ENERGY STAR Qualified 15.5 - 16.9 cu ft)</td>
<td>899.06 kWh/Unit 0.115 kW/Unit</td>
<td>675.00 kWh/Unit 0.086 kW/Unit</td>
<td>133% 133%</td>
<td>• Ex ante assumptions unknown, however same ex ante deemed value applied regardless of refrigerator volume (cu. ft.) • Used ENERGY STAR calculator to determine kWh consumption for efficient refrigerator based on volume • Used data from existing Appliance Recycling Program in Midwest US state and applied algorithm from the IN TRM V2.2 to determine the kWh consumption of the existing refrigerator based on volume</td>
</tr>
<tr>
<td>19</td>
<td>Refrigerator Replacement (ENERGY STAR Qualified 17.0 - 18.4 cu ft)</td>
<td>941.74 kWh/Unit 0.120 kW/Unit</td>
<td>675.00 kWh/Unit 0.086 kW/Unit</td>
<td>140% 140%</td>
<td>• Used ENERGY STAR calculator to determine kWh consumption for efficient refrigerator based on volume • Used data from existing Appliance Recycling Program in Midwest US state and applied algorithm from the IN TRM V2.2 to determine the kWh consumption of the existing refrigerator based on volume</td>
</tr>
<tr>
<td>20</td>
<td>Refrigerator Replacement (10.0 - 12.5 cu ft)</td>
<td>758.22 kWh/Unit 0.097 kW/Unit</td>
<td>675.00 kWh/Unit 0.086 kW/Unit</td>
<td>112% 112%</td>
<td>• Ex ante assumptions unknown, however same ex ante deemed value applied regardless of freezer volume (cu. ft.) • Used ENERGY STAR calculator to determine kWh consumption for efficient freezer based on volume • Used data from existing Appliance Recycling Program in Midwest US state and applied algorithm from the IN TRM V2.2 to determine the kWh consumption of the existing freezer based on volume</td>
</tr>
<tr>
<td>21</td>
<td>Freezer Replacement (ENERGY STAR Qualified 12 - 14.4 cu ft)</td>
<td>479.19 kWh/Unit 0.065 kW/Unit</td>
<td>633.00 kWh/Unit 0.086 kW/Unit</td>
<td>76% 76%</td>
<td>• Ex ante assumptions unknown, however same ex ante deemed value applied regardless of freezer volume (cu. ft.) • Used ENERGY STAR calculator to determine kWh consumption for efficient freezer based on volume • Used data from existing Appliance Recycling Program in Midwest US state and applied algorithm from the IN TRM V2.2 to determine the kWh consumption of the existing freezer based on volume</td>
</tr>
<tr>
<td>22</td>
<td>Freezer Replacement (ENERGY STAR Qualified 14.5 - 16.0 cu ft)</td>
<td>591.43 kWh/Unit 0.080 kW/Unit</td>
<td>633.00 kWh/Unit 0.086 kW/Unit</td>
<td>93% 93%</td>
<td>• Ex ante assumptions unknown, however same ex ante deemed value applied regardless of freezer volume (cu. ft.) • Used ENERGY STAR calculator to determine kWh consumption for efficient freezer based on volume • Used data from existing Appliance Recycling Program in Midwest US state and applied algorithm from the IN TRM V2.2 to determine the kWh consumption of the existing freezer based on volume</td>
</tr>
</tbody>
</table>
## Appendix G: Savings Assumptions

<table>
<thead>
<tr>
<th>#</th>
<th>Measure Description</th>
<th>Ex Post Per-unit Savings</th>
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<th>Realization Rate</th>
<th>Differences in Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 6,000 – 7,999 BTU/hr)</td>
<td>kWh/Unit 130.46 kW/Unit 0.140</td>
<td>kWh/Unit 122.00 kW/Unit 0.131</td>
<td>107% 107%</td>
<td>• Ex ante assumptions unknown • Applied average EFLHcool across Michigan, Minnesota, Ohio, and New York (EPA, 2002)</td>
</tr>
<tr>
<td>24</td>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 8,000 – 9,999 BTU/hr)</td>
<td>kWh/Unit 167.74 kW/Unit 0.180</td>
<td>kWh/Unit 154.00 kW/Unit 0.165</td>
<td>109% 109%</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 10,000 – 12,000 BTU/hr)</td>
<td>kWh/Unit 205.03 kW/Unit 0.220</td>
<td>kWh/Unit 195.00 kW/Unit 0.209</td>
<td>105% 105%</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Dehumidifier Replacement (ENERGY STAR Qualified 14.2 - 21.2 l/day)</td>
<td>kWh/Unit 273.13 kW/Unit 0.082</td>
<td>kWh/Unit 485.00 kW/Unit 0.146</td>
<td>56% 56%</td>
<td>• Increased energy usage per liter for baseline. This decreases ex post savings • Increased energy usage per liter for ENERGY STAR model. This increases ex post savings slightly • Increased annual hours of use. This increases ex post savings slightly</td>
</tr>
<tr>
<td>27</td>
<td>Dehumidifier Replacement (ENERGY STAR Qualified 21.3 - 25.4 l/day)</td>
<td>kWh/Unit 360.31 kW/Unit 0.108</td>
<td>kWh/Unit 664.00 kW/Unit 0.200</td>
<td>54% 54%</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Dehumidifier Replacement (ENERGY STAR Qualified 25.5 - 35.5 l/day)</td>
<td>kWh/Unit 259.57 kW/Unit 0.078</td>
<td>kWh/Unit 934.00 kW/Unit 0.281</td>
<td>28% 28%</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Programmable Thermostat – Baseboard</td>
<td>kWh/Unit 63.15 kW/Unit 0.000</td>
<td>kWh/Unit 63.00 kW/Unit 0.000</td>
<td>100% 100%</td>
<td>• No adjustment applied • Slight differences due to rounding</td>
</tr>
</tbody>
</table>
### Appendix G. Savings Assumptions

<table>
<thead>
<tr>
<th>#</th>
<th>Measure Description</th>
<th>Ex Post Per-unit Savings</th>
<th>Ex Ante Per-unit Savings</th>
<th>Realization Rate</th>
<th>Differences in Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Programmable Thermostat – Electric Furnace</td>
<td>2,011.25 kWh/Unit 0.021 kW/Unit</td>
<td>2,151.00 kWh/Unit 0.076 kW/Unit</td>
<td>94% 28%</td>
<td>• Disallowed cooling savings for the portion of participants who do not have cooling based on PY2015 HAP participant survey data. This decreases ex post savings</td>
</tr>
</tbody>
</table>
### Appendix H. Behavioural Savings Calculations

#### Overall Energy (kWh) Savings

<table>
<thead>
<tr>
<th>Energy Savings</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings Attributable to Behavior Change</td>
<td>174,528</td>
</tr>
<tr>
<td>Total HAP Net Verified Energy Savings</td>
<td>16,052,556</td>
</tr>
</tbody>
</table>

#### Behaviour-Specific Energy (kWh) Savings

<table>
<thead>
<tr>
<th>Action</th>
<th>Savings (Unadjusted)</th>
<th>Savings (Adjustment Factor Applied)</th>
<th>Savings (Scaled to all 2015 Participants)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated TV energy-saving settings</td>
<td>360</td>
<td>206</td>
<td>9,550</td>
</tr>
<tr>
<td>Activated computer power-save mode</td>
<td>1,168</td>
<td>700</td>
<td>33,141</td>
</tr>
<tr>
<td>Turned off dishwasher heated dry</td>
<td>378</td>
<td>223</td>
<td>10,488</td>
</tr>
<tr>
<td>Regularly wash clothes in cold water</td>
<td>1,449</td>
<td>823</td>
<td>38,218</td>
</tr>
<tr>
<td>Regularly air-dried clothing</td>
<td>2,128</td>
<td>1,368</td>
<td>64,044</td>
</tr>
<tr>
<td>Turned down temperature on hot water tank</td>
<td>571</td>
<td>393</td>
<td>19,088</td>
</tr>
</tbody>
</table>

#### 2015 Participant Survey Responses

<table>
<thead>
<tr>
<th>Action</th>
<th>Count</th>
<th>Percentage</th>
<th>Valid Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated TV energy-saving settings</td>
<td>12</td>
<td>3%</td>
<td>356</td>
</tr>
<tr>
<td>Activated computer power-save mode</td>
<td>16</td>
<td>5%</td>
<td>349</td>
</tr>
<tr>
<td>Turned off dishwasher heated dry</td>
<td>7</td>
<td>2%</td>
<td>351</td>
</tr>
<tr>
<td>Regularly wash clothes in cold water</td>
<td>21</td>
<td>6%</td>
<td>356</td>
</tr>
<tr>
<td>Regularly air-dried clothing</td>
<td>7</td>
<td>2%</td>
<td>353</td>
</tr>
<tr>
<td>Turned down temperature on hot water tank</td>
<td>7</td>
<td>2%</td>
<td>340</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action</th>
<th>Program Attribution Adjustment Factor*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Valid Base</td>
</tr>
<tr>
<td>Activated TV energy-saving settings</td>
<td>0.57</td>
</tr>
<tr>
<td>Activated computer power-save mode</td>
<td>0.60</td>
</tr>
<tr>
<td>Turned off dishwasher heated dry</td>
<td>0.59</td>
</tr>
<tr>
<td>Regularly wash clothes in cold water</td>
<td>0.57</td>
</tr>
<tr>
<td>Regularly air-dried clothing</td>
<td>0.64</td>
</tr>
<tr>
<td>Turned down temperature on hot water tank</td>
<td>0.69</td>
</tr>
</tbody>
</table>

*Program attribution adjustment factor reflects the average of two follow-up ratings of the degree to which the HAP influenced behaviors.
### Behavioral Energy Savings Assumptions

<table>
<thead>
<tr>
<th>Measure</th>
<th>Annual Energy Savings</th>
<th>Unit of Measure</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn on energy savings setting on TV</td>
<td>30 kWh</td>
<td>Per television</td>
<td>ENERGY STAR® Consumer Electronics calculator (assuming default inputs). Assumes move from standard television to ENERGY STAR® television which is assumed to be equivalent to activating energy savings settings on TV.</td>
</tr>
<tr>
<td>Turn computer to &quot;power saving mode&quot;</td>
<td>73 kWh</td>
<td>Per computer</td>
<td>ENERGY STAR® IT savings calculator. Assume one notebook computer with display per participant. Assumed default inputs, but modified business hours and usage patterns to align more closely with expected residential usage.</td>
</tr>
<tr>
<td>Turn off &quot;heated dry&quot; setting on dishwasher</td>
<td>54 kWh</td>
<td>Per dishwasher</td>
<td>Per the California Energy Commission, not using the heated dry setting on a dishwasher will save between 15% and 50% of dishwasher energy usage. Used conservative assumption of 20%. <a href="http://www.consumerenergycenter.org/residential/appliances/dishwashers.html">http://www.consumerenergycenter.org/residential/appliances/dishwashers.html</a> Per the ENERGY STAR® appliance calculator, an ENERGY STAR® dishwasher uses 270 kWh per year assuming all default assumptions. 20% savings from this is 54 kWh. Assumed ENERGY STAR® model to be conservative.</td>
</tr>
<tr>
<td>Regularly wash clothes in cold water</td>
<td>69 kWh</td>
<td>Per clothes washer</td>
<td>ENERGY STAR® appliance calculator shows an ENERGY STAR® clothes washer uses 138 kWh per year for water heating purposes. If we assume &quot;regularly&quot; means 50% of the time, this would result in savings =138*50% = 69 kWh on hot water energy consumption.</td>
</tr>
<tr>
<td>Regularly air-dry clothing</td>
<td>304 kWh</td>
<td>Per participant</td>
<td>ENERGY STAR® appliance calculator shows an ENERGY STAR® clothes dryer uses 608 kWh per year. If we assume &quot;regularly&quot; means 50% of the time to be conservative, this would result in savings = 608*50% = 304 kWh on dryer energy consumption.</td>
</tr>
<tr>
<td>Turn temperature down on hot water tank</td>
<td>81.6 kWh</td>
<td>Per participant</td>
<td>Per ex post calculations conducted for other clients and consistent with IL TRM assuming 15 degree F temperature reduction.</td>
</tr>
</tbody>
</table>
Appendix I. Cost-Effectiveness Results

Opinion Dynamics calculated three cost-effectiveness metrics: the Program Administrator Cost (PAC) test, the Total Resource Cost (TRC) test, and the Levelized Cost of Capacity and Energy. The results incorporated avoided costs provided by the IESO for each season and time of use period with measure load shapes to obtain program benefits. The 2015 program expenditures, discount rate, inflation rate, and line losses provided by the IESO were used for this analysis.

Overall Cost-Effectiveness Results:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Measure Category</th>
<th>Measure</th>
<th>TRC Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL twister (60w)</td>
<td>4.48</td>
</tr>
<tr>
<td>2</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL twister (75w)</td>
<td>3.16</td>
</tr>
<tr>
<td>3</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL twister (100w)</td>
<td>1.84</td>
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<tr>
<td>4</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL tri-light (60-75-100w)</td>
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<tr>
<td>5</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL-PAR30 (75w outdoor)</td>
<td>1.23</td>
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<tr>
<td>6</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL-PAR38 (100w indoor)</td>
<td>1.60</td>
</tr>
<tr>
<td>7</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL-PAR38 (100w outdoor)</td>
<td>1.01</td>
</tr>
<tr>
<td>8</td>
<td>Lighting</td>
<td>ENERGY STAR qualified CFL-covered A19 (60w)</td>
<td>1.21</td>
</tr>
<tr>
<td>9</td>
<td>Block Heater Timer</td>
<td>Block Heater Timer (just timer)</td>
<td>1.58</td>
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<tr>
<td>10</td>
<td>Power Bar</td>
<td>Power Bar with integrated timer</td>
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<tr>
<td>11</td>
<td>Hot Water</td>
<td>Hot Water Tank Pipe Insulation - ½” (per cu foot)</td>
<td>53.58</td>
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<tr>
<td>12</td>
<td>Hot Water</td>
<td>Hot Water Tank Pipe Insulation - ¾” (per cu foot)</td>
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<tr>
<td>13</td>
<td>Hot Water</td>
<td>Hot Water Tank Insulation - Fiberglass R10</td>
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<td>14</td>
<td>Hot Water</td>
<td>Efficient Shower Head (standard) &lt; 4.8 L/min</td>
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<tr>
<td>15</td>
<td>Hot Water</td>
<td>Efficient Shower Head (hand-held) &lt; 4.8 L/min</td>
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<tr>
<td>16</td>
<td>Hot Water</td>
<td>Low-Flow Aerator (kitchen) &lt; 5.7 L/min</td>
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<tr>
<td>17</td>
<td>Hot Water</td>
<td>Low-Flow Aerator (bathroom) &lt; 3.8 L/min</td>
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<td>18</td>
<td>Refrigerator/Freezer</td>
<td>Refrigerator Replacement (ENERGY STAR Qualified 15.5–16.9 cu ft)</td>
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<td>Refrigerator/Freezer</td>
<td>Refrigerator Replacement (ENERGY STAR Qualified 17.0–18.4 cu ft)</td>
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<td>Refrigerator Replacement (10.0–12.5 cu feet)</td>
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<td>Freezer Replacement (ENERGY STAR Qualified 12.0–14.4 cu feet)</td>
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<td>22</td>
<td>Refrigerator/Freezer</td>
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<tr>
<td>Measure Number</td>
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<td>Measure</td>
<td>TRC Test</td>
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<td>-------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>23</td>
<td>Air Conditioning</td>
<td>Window Air Conditioner Replacement (ENERGY STAR qualified 6,000–7,999 BTU/hr)</td>
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<tr>
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<td>Air Conditioning</td>
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<tr>
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<td>26</td>
<td>Air Conditioning</td>
<td>Dehumidifier Replacement (ENERGY STAR qualified 14.2–21.2 L/day)</td>
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<tr>
<td>27</td>
<td>Air Conditioning</td>
<td>Dehumidifier Replacement (ENERGY STAR qualified 21.3–25.4 L/day)</td>
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<tr>
<td>28</td>
<td>Air Conditioning</td>
<td>Dehumidifier Replacement (ENERGY STAR qualified 25.5–35.5 L/day)</td>
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<tr>
<td>29</td>
<td>Programmable Thermostat</td>
<td>Programmable Thermostat – Line Voltage</td>
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<tr>
<td>30</td>
<td>Programmable Thermostat</td>
<td>Programmable Thermostat – Low Voltage</td>
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<tr>
<td>31</td>
<td>Weatherization</td>
<td>Comprehensive Draft-Proofing</td>
<td>2.09</td>
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<tr>
<td>32</td>
<td>Weatherization</td>
<td>Attic Insulation</td>
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<td>33</td>
<td>Weatherization</td>
<td>Wall Insulation</td>
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<tr>
<td>34</td>
<td>Weatherization</td>
<td>Basement Insulation</td>
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</tr>
</tbody>
</table>
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