2013 Evaluation
Home Assistance Program
Prepared for the Ontario Power Authority

November 2014
ACKNOWLEDGMENTS

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Opinion Dynamics also thanks the staff at the local distribution companies and the program delivery agents who were more than helpful in sharing information and providing their insights on the Home Assistance Program.

Finally, we thank those customers who participated in our telephone surveys. The data provided from these surveys will contribute significantly to our efforts to provide quality feedback on the Home Assistance Program, which we believe will help improve program delivery and administration in the coming years.
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<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>FAST</td>
<td>Field Audit Support Tool</td>
</tr>
<tr>
<td>HAP</td>
<td>Home Assistance Program</td>
</tr>
<tr>
<td>LDC</td>
<td>Local Distribution Company</td>
</tr>
<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
</tr>
<tr>
<td>NTGR</td>
<td>Net-to-gross Ratio</td>
</tr>
<tr>
<td>OPA</td>
<td>Ontario Power Authority</td>
</tr>
<tr>
<td>PAC</td>
<td>Public Administrator Cost</td>
</tr>
<tr>
<td>PBR</td>
<td>Preliminary Billing Report</td>
</tr>
<tr>
<td>TRC</td>
<td>Total Resource Cost</td>
</tr>
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</table>
1. Executive Summary

The Ontario Power Authority (OPA) contracted with Opinion Dynamics Corporation (Opinion Dynamics) to conduct impact and process evaluations of the Low-Income Initiative (the Initiative), marketed as the Home Assistance Program (HAP) for the period 2011-2014. A previous report submitted by Opinion Dynamics in February 2014 included the impact evaluation for the 2011-2012 period, and preliminary results of the process evaluation for the 2011-2013 period. This report will discuss the results of the full process evaluation, and results of the impact and cost-effectiveness evaluations through 2013.

1.1 Summary of Evaluation Goals and Objectives

The HAP was designed to improve electric energy efficiency in low-income households in Ontario, and to enable low-income residents to manage their electricity use more effectively. Participants include tenants and homeowners meeting the income requirements.

The evaluation includes the following elements:

- Impact evaluation that assesses gross energy and demand savings
- Process evaluation that identifies opportunities for improvement to the Initiative, and assesses the effectiveness of the Initiative’s design and delivery

More specifically, this evaluation report covers the following objectives:

- Determine gross and net energy savings and peak demand reductions achieved through the Initiative for the calendar year 2013
- Create and/or review and update as appropriate the prescriptive per-unit input assumptions of all measures included in the Initiative
- Determine the relative impacts of the delivery strategy used to gain participation, and investigate the appropriateness of the current incentive structure
- Develop an understanding of various local distribution company (LDC) delivery strategies, with a focus on outreach and participant education
- Determine the effectiveness of the training component in driving additional behavioral changes
- Validate the integrity of the Initiative’s data-tracking systems and compliance with quality assurance procedures

1.2 Summary of Impact Evaluation Results

Opinion Dynamics verified the gross energy and demand savings claimed in the HAP participant database for projects completed in 2013. At OPA’s request, we calculated a net-to-gross ratio (NTGR) as part of the 2013 impact evaluation; however, we applied a NTGR of 1 when calculating net verified savings. Low-income direct
install programs similar to the HAP typically assume a NTGR of 1, as free ridership and spillover are characteristically low.

Based upon the participant data records provided by the OPA, Opinion Dynamics estimates that the HAP resulted in 2,361 kW and 20,987,275 kWh of savings in 2013, as shown in Table 1. For the same participants, the realization rates were 26% for kW and 88% for kWh savings. The low kW realization rate was primarily due to the Field Audit Support Tool’s (FAST) calculations of deemed savings for attic insulation and basement insulation. The calculations were greatly inflating demand savings for those measures, and led to equally inflated ex-ante demand savings for the HAP.

<table>
<thead>
<tr>
<th>Program Metric</th>
<th>Home Assistance Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Participants</td>
<td>26,756</td>
</tr>
<tr>
<td>Gross Verified Demand Savings (kW)</td>
<td>2,361</td>
</tr>
<tr>
<td>Gross Verified Annual Energy Savings (kWh)</td>
<td>20,987,275</td>
</tr>
<tr>
<td>Program Demand Realization Rate</td>
<td>26%</td>
</tr>
<tr>
<td>Program Savings Realization Rate</td>
<td>88%</td>
</tr>
</tbody>
</table>

Table 1. Summary of 2013 Impact Evaluation Results

At the OPA’s request, we researched the NTGR through our participant survey, in which we asked participating HAP customers different batteries of questions per-measure on free ridership and spillover. Free ridership represents the percentage of savings that customers would have achieved in the absence of the program. Spillover represents additional savings that customers achieved without program rebates and would not have happened in the absence of the program.

As part of our 2013 impact evaluation, we also researched installation verification and persistence factors for each measure. Installation verification is the ratio of the quantity of each measure respondents reported receiving through the program, to the quantity tracked by the OPA. Persistence factor is the ratio of what respondents said was installed at the time of the audit, to what was still installed at the time of the survey. Table 2 provides the program-wide installation verification and persistence factors, along with net-to-gross information.

<table>
<thead>
<tr>
<th>Program Metric</th>
<th>Home Assistance Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Ridership (weighted by kW)</td>
<td>8.7%</td>
</tr>
<tr>
<td>Spillover</td>
<td>1.7%</td>
</tr>
<tr>
<td>HAP Net-to-Gross Ratio</td>
<td>93%</td>
</tr>
<tr>
<td>Installation Verification and Persistence Factor</td>
<td>86%</td>
</tr>
</tbody>
</table>

Table 2. Summary of Net-to-Gross Ratio and Persistence Factors

The main findings from the impact evaluation include:

- Data compiled by the OPA for estimating program savings still had a fair number of duplicate records and other errors, which required reconciliation.

- Free ridership and spillover rates were low, supporting the application of a NTGR of 1 for 2013. Also, installation and persistence factors were high, demonstrating a high level of accuracy in aspects of
Program tracking. For one measure, programmable thermostats, the installation verification rate was lower than that of others (61%), primarily due to respondents reporting that their thermostats had not been programmed, a necessary action to acquire savings from this measure.

1.3 Summary of Process Evaluation Results

In late 2013 and early 2014, Opinion Dynamics collected information from LDCs, delivery agents, social housing providers, gas utilities, and program participants to evaluate HAP processes. Although some of the initial challenges to implementing the HAP—such as critical upgrades to the FAST and delay in processing payments—were addressed by the OPA, according to LDCs, delivery agents, and participants, concerns continue in the following areas:

- Some LDC dissatisfaction with program implementation related to excessive administrative burdens and the low savings that typically result from the program
- Disagreement on the credentials or experience required of HAP auditors
- Underfunded program administration and marketing and outreach budgets
- Difficulties effectively identifying low-income participants outside of social housing communities
- Inconsistent participant education without clear OPA guidance
- Continuing issues with the FAST, including deemed savings values and the export feature
- Discrepancies between measure and audit cost caps and actual costs realized by LDCs and delivery agents
- Difficulty coordinating with other social service delivery organizations operating in low-income communities
- The project-by-project total resource cost (TRC) requirement makes equitable program administration difficult

Results released in a report\(^1\) to the OPA in February of 2014 and an independent QA/QC review conducted by Bronson Consulting, showed high levels of participant satisfaction for the program and the measures it provides. LDCs expressed some dissatisfaction with program implementation, primarily due to the administrative burden combined with the low savings that typically result from the program, and other factors discussed in detail in the Process Evaluation (Section 4, pg. 21 of this report). Opinion Dynamics believes that there are a number of changes that can be implemented to the program’s design and administration that may help the HAP provide more value to participants and LDCs in the future. We discuss these changes in more detail in the following sections of this report.

Participation levels increased considerably in 2013, though a substantial percentage (roughly 77%)\(^2\) of those participants are still coming from social housing communities. Interviews with LDCs, delivery agents, and social housing providers revealed strong involvement on the part of social housing communities, to the benefit of the program. Building managers reported playing a large part in signing customers up for the HAP and providing informal education and outreach—that is, informing their residents of program offerings and its benefits. Though keeping close ties with social housing communities will likely continue to benefit the HAP, as that market becomes saturated it will be important for program administrators, particularly in regards to meeting program participation goals, to search for different sources of participants moving forward.

Section 4.3, in the process section of this report, provides additional details, including findings and recommendations, on each of these areas mentioned above.

### 1.4 Conclusion and Recommendations

The HAP has grown considerably in its two full years of operation and, as the OPA and LDCs contemplate changes to the program’s design, we offer several recommendations that we believe, in conjunction with these efforts, will improve its overall implementation and savings results.

- **Exploring Additional Measures:** The OPA and the LDCs should consider the feasibility and cost-effectiveness of offering solid-state lighting products (such as LEDs) in the HAP, as baseline lighting efficiency increases. In addition, during interviews with LDCs, some HAP administrators expressed interest in exploring the cost-effectiveness of offering air source heat pumps to certain customers.

- **Delivery Model and Strategies:** The OPA should clearly define the experience level and auditor certification requirements—including auditor training protocols—noting that certified energy auditors may not be required for all types of HAP audits. Furthermore, the OPA should encourage LDCs to leverage local resources by using existing customer intake systems whenever possible—such as local aid agencies, social services offices, and food pantries—to identify and recruit program participants.

- **Marketing and Outreach:** The OPA should consider increasing the referral incentive to encourage local aid agencies to collaborate with the LDCs and delivery agents in identifying and marketing the HAP to qualified customers. In addition, the OPA should consider providing the LDCs with designated marketing budgets, as well as creating a list of best practices based on examples from LDCs that have created successful marketing and outreach plans.

- **Education and Training Component:** The OPA should reinforce the educational component of the HAP, and provide specific guidance to LDCs and delivery agents, such as leveraging LDC resources to create a standard suite of “leave behind” materials. These would be specific to measures received through the program or common customer needs, such as information on making behavioral changes that will reduce a household’s overall energy use.

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\(^2\) We based this estimate on an analysis of program participant data.
Executive Summary

- **Tracking Systems and Data Collection:** The OPA should develop and distribute a tool, such as an Excel macro, that will convert the current FAST-generated PBR export into a file that can interact with OPA’s CRM system for easier upload and billing management. Furthermore, it is our recommendation that the OPA and LDCs track up to three different unique identifiers to solve data quality issues, such as duplicate records. Finally, the OPA should consider using different methods of aggregating data into its final HAP dataset to avoid potential errors in standardization of formatting and data alignment.

- **Coordination and Cooperation among Stakeholders:** The OPA should establish direct and clear lines of communication with, and work to leverage the resources of, various HAP stakeholders, such as delivery agents, local contractors, gas utilities, and other stakeholders involved in HAP delivery.

- **Implementation and Processes:** The OPA should work to reduce the administrative burden on customers, delivery agents, LDCs, and OPA program staff—specifically regarding customer sign-up, as well as LDC and delivery agent reimbursement processes. Furthermore, the OPA should consider transitioning to deemed savings values for weatherization measures, eliminating the need for the HOT2000 model in favor of potentially using a simpler algorithm with easy-to-measure building characteristics as inputs.
2. Introduction

2.1 Evaluation Goals and Objectives

This report covers the evaluation of the Initiative, marketed as the HAP, and is comprised of the following elements:

- Impact evaluation that assesses energy and demand savings (gross and net) and the cost-effectiveness of the Initiative for measures installed in 2013
- Process evaluation that identifies opportunities for improvement to the Initiative, and assesses the effectiveness of the Initiative's design and delivery

Table 3 outlines data collection efforts and indicates if the data supported either the process and/or the impact evaluation.

<table>
<thead>
<tr>
<th>Data Collection Effort</th>
<th>Impact</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiative Staff, Stakeholder, &amp; LDC Interviews (n=11)</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Initiative Database Analysis</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Review of Savings Assumptions &amp; Verification Audit Analysis</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Participant Surveys (n=375)</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Contractor/Field Technician Interviews* (n=2)</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Social Housing Building Manager Interviews (n=21)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Two interviewees, representing three delivery agents

More specifically, this report covers an evaluation with the following objectives, which we stated in the revised 2011-2014 evaluation plan submitted to the OPA on November 1, 2013:

- Determine gross energy savings and peak demand reductions achieved through the Initiative for measures installed in 2013
- Determine net-to-gross adjustment factors and estimate net energy savings for those same measures
- Create and/or review and update as appropriate the prescriptive per-unit input assumptions of all measures included in the Initiative
- Determine the relative impacts of the delivery strategy used to gain participation, and investigate the appropriateness of the current incentive structure
- Develop an understanding of various LDC delivery strategies, with a focus on outreach and participant education
- Determine the effectiveness of the training component in driving additional behavioral changes
Validate the integrity of the Initiative’s data-tracking systems and compliance with quality assurance procedures

2.2 Program Purpose

The Low-Income Initiative seeks to realize opportunities to improve electric energy efficiency in the homes of low-income Ontarians, and to enable low-income residents to manage their electricity use more effectively. In an effort to maximize customer participation and energy savings generated by the Initiative, the HAP employs a “whole-home approach.” The whole-home approach presents the consumer with energy efficiency opportunities for all energy end uses within the home; helps the consumer understand how these systems are interconnected through an in-home audit; and will retrofit/install selected measures deemed applicable to each participant’s premise. An educational component, including home energy management strategies, complements the measures installed through the program.

The program maintains that in gas-heated homes, the whole-home approach will be achieved by coordinating the delivery of existing gas utility-funded low-income programs alongside the Low-Income Initiative. As such, LDCs are encouraged to engage gas utilities in the marketing and delivery of the program. The OPA, Enbridge Gas Distribution, and Union Gas Limited have developed a memorandum of understanding (MOU) to set out the principles and framework for coordinated program delivery to support this effort.

2.3 Program Goals

The HAP expects to realize the following objectives:

- Improvements to the electric efficiency of the existing low-income housing stock in Ontario
- Electricity demand reductions and energy savings
- Adoption of conservation behaviors marketed through the program 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 low-income customer offerings

OPA funds and the LDCs deliver the HAP, either through their own internal resources or through contractors. Low-income participants receive measures at no charge and include:

- Seven basic measures: screw-in light bulbs, block heater timer, smart power bar, appliances (refrigerators/freezers), showerheads, faucet aerators, hot water pipe wrap/tank insulation
- Four extended measures (window A/C, central HVAC, dehumidifier, programmable thermostat)
- Two weatherization measures (draft proofing, insulation)
Eligibility for the program is based upon individual or household income, and whether or not they are participants in certain social benefits programs in Ontario.

2.4 Report Overview

The remainder of this report presents findings and recommendations related to:

- 2013 impact evaluation
- 2013 process evaluation
- 2013 review of the measure savings and assumptions
3. Impact Evaluation

In this section, we present the methods, results, and recommendations from Opinion Dynamics’ 2013 impact evaluation of the HAP. In addition to revised savings estimates, a key objective of the impact analysis of the HAP is to provide attribution and related adjustment factors that the OPA and the LDCs can use to inform future program design.

3.1 Methodology

Data collected via participant survey informs both the impact and process evaluation. We present the specifics used to conduct the survey research and interviews within the Process Evaluation Section of this report. Additionally, Appendix E provides the survey instruments. For the impact evaluation, we collected survey data to inform program attribution (i.e., free ridership and spillover rates) and installation verification and persistence factors as described below.

Determination of gross and net impacts consists of several steps. We base gross impacts on a thorough review of the program tracking database and data collected from customers regarding installation. To arrive at net impacts, we use customer reported data regarding the likelihood of installation of measures absent the program to calculate a net-to-gross ratio (NTGR). We multiply this NTGR by the gross impact to arrive at net impacts.

For reporting purposes, we divided specific measures into broader categories based on similarity of equipment and savings assumptions. We calculated all savings and other factors at the individual measure level, and then aggregated savings into the associated measure group. Appendix A provides a complete list of HAP measures and their associated categories.

Program Tracking Data Review

Opinion Dynamics reviewed the program participation data to identify data quality issues such as duplicate records, missing data and outliers. These cleaned data were used to quantify program savings. We received a file from the OPA that contained 64,505 records of all participants and activities from the beginning of the program through March 12, 2014. Of those, the description of 27,358 records was “outreach funding,” and we removed them from this analysis for having no energy or demand savings associated with them. In addition, we removed 8,909 records because they occurred in 2011, 2012, or 2014 and the focus of this report is on 2013 measures only. To be conservative, we removed 150 records that had no date recorded. After removing 1,314 duplicates (described in detail below) and fixing other erroneous records, 26,756 unique records remained, representing the same number of unique participants for program year 2013.

In cleaning the data, Opinion Dynamics identified and removed duplicate records based on Field Audit Support Tool (FAST) file IDs, measures installed, savings values, and dates. The OPA provided key information that allowed us to identify complete and partial duplicate records, and information that allowed us to identify the

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3 During our data cleaning we found 36 records that appeared to be related, but were not completely duplicates. We combined these related records into 18 unique participants.
correct record to keep among the partial duplicates. The following list includes the types of duplicates and the number of observations removed at each step:

- Removed complete duplicate records (1,177 records)
- Removed records from Entegrus and EnWin Utilities when there were duplicates or where dates were missing (137 records)
- Collapsed 36 records to 18 that were related but non-perfect duplicates (18 records)

The final cleaning step involved reshaping the data and fixing certain records where FAST file IDs, dates, or installation costs appeared to have shifted into different columns. Our cleaning process involved adjusting 84 records where the FAST file ID appeared to be in the installation cost column and 220 records where an unknown cost value appeared to be in the FAST file ID column.

**Installation Verification and Persistence Factors**

We calculated installation verification and persistence rates based on responses from our sample of surveyed program participants. Each participant was asked a battery of questions about each measure to determine the quantity of measures received through the program, the quantity that was installed (either by a program representative or by the participant), and the quantity that was still installed at the time of the survey. We based both rates on self-reported numbers and, in the case of the installation verification rate, how those quantities compared to those that the OPA recorded in their program records. We calculated both factors at the individual measure level. We then averaged these results across the corresponding measure group and weighted them by each group’s overall kW savings; as it is our understanding that LDCs’ primarily base their savings goals on kW savings.

For tank wrap, pipe wrap, and weatherization measures, we asked respondents only to verify that they had received the measures and not to provide the specific quantity. Furthermore, we verified that customers both received and programmed the programmable thermostat. We found that, in many cases, customers had received their thermostat, yet it had not been programmed. For the purposes of calculating these factors, we treated un-programmed thermostats as if the customer had not received it, as no savings would have resulted from their installation.

**Net-to-Gross Ratio**

One goal of the 2013 evaluation of the HAP was to estimate net-to-gross ratios (NTGRs) that OPA and LDCs can use as a reference for future program planning and design. In this report, we express the NTGR using two components, free ridership (FR) and spillover (SO) rates. 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.

Typically, low-income programs like the HAP do not apply a researched NTGR, given the assumption that FR and SO rates are very low for low-income programs. For this reason, for the 2013 impact evaluation we have assumed a NTGR of 1 when reporting net savings values. However, we still conducted NTGR research based on our participant survey for the edification of the OPA, the LDCs, and the delivery agents. As expected, FR and SO rates are low, and we present the results of our FR and SO research in Section 3.2.2.
Impact Evaluation

The formula that we used to calculate NTGR is expressed as:

\[ NTGR = 1 - FR + Participant\, SO \]

As stated previously, we relied upon the participant surveys to develop self-reported FR and SO estimates at the measure category and program level. Using the survey instrument provided in Appendix D, we asked program participants a series of structured and open-ended questions about the influence of the program on the timing of the installation of energy-efficient equipment. Below, we discuss the methods used to obtain both of these components in detail.

**Free Ridership**

We calculated free ridership values for a sample of survey respondents based on a battery of questions asking how and if respondents would have replaced each measure, and when they would have done so in the absence of the program. In addition, for those that said they would have replaced the equipment on their own, we asked about the type of equipment they would have purchased while citing its cost to ensure the respondent was, in actuality, a free rider.

While we obtained similar information regarding FR for each respondent, the actual FR questions are unique to each measure type and the logic used to reach each FR value can vary by measure type (see Appendix F for flow charts describing the FR algorithms we used). We assigned respondents a FR value of 1 if they were full free riders—that is, the customer would have purchased energy-efficiency equipment on their own in the absence of the program. We assigned respondents a FR value of 0.5 if they said they would have replaced some of their equipment with the energy-efficient equivalent, or would have replaced the equipment later.

**Spillover**

The participant survey also included a battery of qualitative questions to develop a program-level spillover factor. These questions asked whether the participant took any actions on their own to improve the energy efficiency of their home, and, if so, what specifically was done and how the HAP influenced them to do so.

All participants that qualified as having some spillover met the following criteria: 1) they must have installed an energy-efficient measure without being rebated by the program; 2) they must have indicated a high level of program influence on the choice to install the measures; and 3) there must be evidence within the response to an open-ended survey question that supports the influence of the program.

For each respondent meeting these criteria, we calculated savings in kWh and kW. Spillover savings account for electric savings only, and exclude savings directly related to gas space heating or gas water heating. Our main source for inputs for the measures specific calculations was the OPA 2011 Prescriptive Measures and Assumptions List (2011 M&A). We have documented additional resources required to calculate participant spillover, such as assumptions used for non-HAP measures, in Table 8 in section 3.2.2.

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4 The customer must have answered a 6 or higher on a 7-point scale where 1 means “no influence” and 7 means “a great deal of influence.”
3.2 Results

Using the updated savings where appropriate, and the existing OPA deemed savings values for the remaining measures, Opinion Dynamics calculated the gross energy and demand impacts from the 26,756 participants. We compared our estimated gross impacts to the measure-level and project-level savings listed in the database to calculate realization rates at the project, LDC, and program level. Table 4 summarizes program-level information.

Table 4. Low-Income Initiative Gross Impacts (2013)

<table>
<thead>
<tr>
<th>Savings Type</th>
<th>OPA Reported⁵</th>
<th>Opinion Dynamics Estimated</th>
<th>Realization Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>kW</td>
<td>8,979</td>
<td>2,361</td>
<td>26%</td>
</tr>
<tr>
<td>kWh</td>
<td>23,953,791</td>
<td>20,987,275</td>
<td>88%</td>
</tr>
</tbody>
</table>

Figure 1 below shows the percent of overall kW savings represented by each measure group. Appendix A provides a complete list of HAP measures that fall into each group. In addition,

⁵ These numbers are based on the project-level savings reported by the OPA for the dataset cleaned by Opinion Dynamics.
Table 5 presents a comprehensive list of kW and kWh savings by measure, including the count of unique participants that received the measure, and the number of measures installed.

![Figure 1: Percent of kW Savings by Measure Group](image-url)
### Table 5. Savings by Measure (2013)

<table>
<thead>
<tr>
<th>Measure Description</th>
<th>kW</th>
<th>kWh</th>
<th>Unique Participants That Installed the Measure</th>
<th>Measures Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement Insulation</td>
<td>444</td>
<td>1,123,134</td>
<td>369</td>
<td>165,331</td>
</tr>
<tr>
<td>Attic Insulation</td>
<td>328</td>
<td>830,716</td>
<td>721</td>
<td>446,535</td>
</tr>
<tr>
<td>Comprehensive Draft-proofing</td>
<td>57</td>
<td>143,849</td>
<td>256</td>
<td>18,306</td>
</tr>
<tr>
<td>Wall Insulation</td>
<td>43</td>
<td>109,311</td>
<td>14</td>
<td>13,715</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL Twister (60w)</td>
<td>403</td>
<td>7,755,331</td>
<td>23,724</td>
<td>198,576</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL Twister (100w)</td>
<td>127</td>
<td>2,443,286</td>
<td>13,005</td>
<td>38,889</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL Twister (75w)</td>
<td>36</td>
<td>686,098</td>
<td>4,387</td>
<td>14,965</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL-Covered A19 (60w)</td>
<td>33</td>
<td>638,052</td>
<td>4,804</td>
<td>17,080</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL-Tri-light (60-75-100w)</td>
<td>31</td>
<td>606,363</td>
<td>4,383</td>
<td>7,563</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL-PAR38 (100w indoor)</td>
<td>3</td>
<td>50,421</td>
<td>239</td>
<td>588</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL-PAR30 (75w outdoor)</td>
<td>0</td>
<td>102,816</td>
<td>585</td>
<td>1,636</td>
</tr>
<tr>
<td>ENERGY STAR Qualified CFL-PAR38 (100w outdoor)</td>
<td>0</td>
<td>34,945</td>
<td>168</td>
<td>392</td>
</tr>
<tr>
<td>Refrigerator Replacement (ENERGY STAR Qualified 15.5-16.9 ft³)</td>
<td>223</td>
<td>1,748,143</td>
<td>2,593</td>
<td>2,597</td>
</tr>
<tr>
<td>Refrigerator Replacement (ENERGY STAR Qualified 17.0-18.4 ft³)</td>
<td>154</td>
<td>1,207,844</td>
<td>1,791</td>
<td>1,794</td>
</tr>
<tr>
<td>Refrigerator Replacement (10.0-12.5 ft³)</td>
<td>58</td>
<td>452,437</td>
<td>663</td>
<td>672</td>
</tr>
<tr>
<td>Freezer Replacement (ENERGY STAR Qualified 12-14.4 ft³)</td>
<td>53</td>
<td>393,979</td>
<td>624</td>
<td>624</td>
</tr>
<tr>
<td>Freezer Replacement (ENERGY STAR Qualified 14.5-16.0 ft³)</td>
<td>45</td>
<td>330,210</td>
<td>523</td>
<td>523</td>
</tr>
<tr>
<td>Low-Flow Showerhead - Electric Water Heating Only</td>
<td>66</td>
<td>547,205</td>
<td>1,596</td>
<td>1,656</td>
</tr>
<tr>
<td>Hot Water Tank Pipe Insulation - 1/2” (Per 3 Feet) - Electric Water Heating Only</td>
<td>40</td>
<td>328,904</td>
<td>1,964</td>
<td>9,875</td>
</tr>
<tr>
<td>Low-Flow Faucet Aerator (Kitchen Faucet 5.7 L/min) - Electric Water Heating Only</td>
<td>31</td>
<td>255,536</td>
<td>2,069</td>
<td>2,084</td>
</tr>
<tr>
<td>Low-Flow Faucet Aerator (Bathroom Faucet 3.8 L/min) - Electric Water Heating Only</td>
<td>15</td>
<td>120,446</td>
<td>1,442</td>
<td>1,719</td>
</tr>
<tr>
<td>Hot Water Tank Pipe Insulation - 3/4” (Per 3 Feet) – Electric Water Heating Only</td>
<td>4</td>
<td>32,741</td>
<td>206</td>
<td>983</td>
</tr>
<tr>
<td>Hot Water Tank Insulation - Fiberglass R10 - Electric Water Heating Only</td>
<td>2</td>
<td>15,856</td>
<td>60</td>
<td>67</td>
</tr>
<tr>
<td>Dehumidifier Replacement (ENERGY STAR Qualified 14, 2-21.2 l/day)</td>
<td>52</td>
<td>173,825</td>
<td>378</td>
<td>378</td>
</tr>
<tr>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 6,000-7,999 BTU/hr)</td>
<td>28</td>
<td>26,258</td>
<td>218</td>
<td>227</td>
</tr>
<tr>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 8,000-9,999 BTU/hr)</td>
<td>28</td>
<td>26,283</td>
<td>178</td>
<td>180</td>
</tr>
<tr>
<td>Dehumidifier Replacement (ENERGY STAR Qualified 21.3-25.4 l/day)</td>
<td>27</td>
<td>90,606</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td>Window Air Conditioner Replacement (ENERGY STAR Qualified 10,000-12,000 BTU/hr)</td>
<td>15</td>
<td>14,052</td>
<td>74</td>
<td>76</td>
</tr>
<tr>
<td>Dehumidifier Replacement (ENERGY STAR Qualified 25.5-35.5 l/day)</td>
<td>7</td>
<td>23,922</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td>Power Bar with Integrated Timer</td>
<td>7</td>
<td>156,196</td>
<td>3,510</td>
<td>3,870</td>
</tr>
<tr>
<td>Block Heater Timer (Just Timer)</td>
<td>0</td>
<td>383,933</td>
<td>696</td>
<td>716</td>
</tr>
<tr>
<td>Programmable Thermostat – Baseboard</td>
<td>0</td>
<td>131,936</td>
<td>969</td>
<td>3,409</td>
</tr>
<tr>
<td>Programmable Thermostat – Electric Furnace</td>
<td>0</td>
<td>2,643</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,361</td>
<td>20,987,275</td>
<td>156,331</td>
<td>955,199</td>
</tr>
</tbody>
</table>

* This number represents that total participation for the HAP in 2013 and not the column total. Values in the column above represent the number of unique participants that received each measure, many of whom may have received multiple measures.
3.2.1  Installation Verification

Table 6 lists the installation and persistence rates for the HAP measure categories. Installation rates describe the percentage of equipment installed, and persistence rates describe the percentage of equipment that remained installed at the time of our participant survey. We calculated both rates based on our participant survey and program-tracking data (see Section 3.1 for more details on this methodology).

<table>
<thead>
<tr>
<th>Measure Category</th>
<th>Installation Rate</th>
<th>Persistence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable Thermostats</td>
<td>61.4%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Power Bars</td>
<td>89.6%</td>
<td>85.0%</td>
</tr>
<tr>
<td>Lighting</td>
<td>91.6%</td>
<td>92.7%</td>
</tr>
<tr>
<td>Hot Water</td>
<td>95.6%</td>
<td>91.7%</td>
</tr>
<tr>
<td>Air Conditioner/Dehumidifier</td>
<td>100.0%</td>
<td>94.8%</td>
</tr>
<tr>
<td>Appliance (Refrigerator/Freezer)</td>
<td>100.0%</td>
<td>99.7%</td>
</tr>
<tr>
<td>Block Heater Timers</td>
<td>100.0%</td>
<td>82.2%</td>
</tr>
<tr>
<td>Weatherization</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

3.2.2  Net-to-Gross Ratio

As discussed in Section 3.1, programs like the HAP typically assume a NTGR of 1, as FR and SO rates are generally expected to be low for low-income programs. For our 2013 evaluated net impacts, we also assumed a NTGR of 1; however, we also conducted research on FR and SO, the results of which are presented below. As stated in the methodology section, we based our findings on responses to our participant survey. We have also included the logic used to calculate FR values in Appendix F. The equation below shows the formula used to derive our NTGR, and how it was calculated.

\[
NTGR = 1 - FR + Participant SO
\]

\[
NTGR = 1 - 8.7\% + 1.7\%
\]

\[
NTGR = 93\%
\]

\[\]

6 For a complete list of HAP measures and their associated measure groups, see Appendix A.
Free Ridership

Table 7 reports rates of free ridership estimated from our participant survey.

Table 7. HAP Free Ridership by Measure Group

<table>
<thead>
<tr>
<th>Measure Category</th>
<th>Free Ridership Ratio*</th>
<th>Percent of kW Savings</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Conditioner/Dehumidifier</td>
<td>25.1%</td>
<td>6.65%</td>
<td>60</td>
</tr>
<tr>
<td>Hot Water</td>
<td>14.9%</td>
<td>6.69%</td>
<td>90</td>
</tr>
<tr>
<td>Refrigerator Freezer</td>
<td>10.9%</td>
<td>22.6%</td>
<td>174</td>
</tr>
<tr>
<td>CFL Screw-in Light bulb</td>
<td>9.0%</td>
<td>26.8%</td>
<td>257</td>
</tr>
<tr>
<td>Power Bars</td>
<td>8.8%</td>
<td>0.30%</td>
<td>65</td>
</tr>
<tr>
<td>Weatherization</td>
<td>0.7%</td>
<td>37.0%</td>
<td>17</td>
</tr>
<tr>
<td>Block Heater Timers</td>
<td>0%</td>
<td>0%</td>
<td>21</td>
</tr>
<tr>
<td>Programmable Thermostats</td>
<td>0%</td>
<td>0%</td>
<td>20</td>
</tr>
</tbody>
</table>

* Weighted by kW savings.

Spillover

Fourteen participants out of the 375 who completed the survey specified that the program influenced them to install different types of measures outside of the program without receiving a rebate. Twelve of the 14 participants received credit for spillover savings. Two participants indicated installing measures that were either gas savings only (i.e., installed plastic over windows), or insufficient information was provided to quantify savings for a particular measure.

To calculate total SO savings and ratios, we used the 2011 Prescriptive Measure and Assumptions List (2011 M&A). Table 8 below describes the relevant assumptions used for our analysis from the 2011 M&A and the participant specific data by measure.
## Table 8. Spillover Measure per-Unit Savings and Participant Data

<table>
<thead>
<tr>
<th>Spillover Measure</th>
<th>Savings kWh/unit</th>
<th>Savings kW/unit</th>
<th>Units</th>
<th>Quantity</th>
<th>Source</th>
<th>Participant Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFL Lighting</td>
<td>46.32</td>
<td>0.0014</td>
<td>Per lamp</td>
<td>38</td>
<td>2011 M&amp;A List</td>
<td>Seven participants installed 38 CFL lamps. The installed wattage is unknown; it was assumed 13W CFL lamps replaced 60W incandescent lamps, as specified in the 2011 M&amp;A.</td>
</tr>
<tr>
<td>LED Lighting</td>
<td>8.87</td>
<td>0.0003</td>
<td>Per lamp</td>
<td>2</td>
<td>2011 M&amp;A List</td>
<td>One participant installed 2 LED lamps. The installed wattage is unknown; it was assumed 6W LED lamps replaced 15W CFL lamps, as specified in the 2011 M&amp;A.</td>
</tr>
<tr>
<td>ENERGY STAR Room A/C</td>
<td>140.71</td>
<td>0.1410</td>
<td>Per Room A/C</td>
<td>6</td>
<td>2011 M&amp;A List</td>
<td>Six participants installed ENERGY STAR room A/Cs. We used an average capacity of 8,000 BTUh based on in-situ metering for OPA’s Keep Cool Pilot program to calculate per-unit savings.</td>
</tr>
<tr>
<td>Dishwasher – Gas WH</td>
<td>26.40</td>
<td>0.0027</td>
<td>Per DW</td>
<td>1</td>
<td>IL TRM v.3.0</td>
<td>One participant installed an ENERGY STAR dishwasher. Space heating fuel type is gas, and we assumed the same fuel type for water heating absent any other data; 44% of dishwasher energy consumption used for electric unit operation, as specified in the IL TRM v.3.0. We base savings on unit operation, and are not for water heating.</td>
</tr>
<tr>
<td>Low-Flow Showerhead – Electric WH</td>
<td>377</td>
<td>0.0290</td>
<td>Per SH</td>
<td>1</td>
<td>2011 M&amp;A List</td>
<td>One participant installed a low-flow showerhead. Space heating fuel type is electric, and we assumed the same fuel type for water heating. The per-unit savings is a deemed value from the 2011 M&amp;A.</td>
</tr>
</tbody>
</table>
### 3.3 Recommendations

CFL measures account for a significant portion of the HAP energy and demand savings. The CFL market is evolving and, as code changes banning the manufacturing and importing of inefficient incandescent light bulbs are phased in, the baseline efficiency of bulbs will increase going forward. While we anticipate that CFLs will remain an important part of HAP savings into the future, they will gradually yield lower savings per unit as the baseline efficiency of residential lighting increases. The OPA and the LDCs should consider the feasibility and cost-effectiveness of offering solid-state lighting products (such as LEDs) in the HAP. In addition, during interviews with LDCs, some HAP administrators expressed interest in exploring the cost-effectiveness of offering air source heat pumps to certain customers.

---

**Table 9. Total Spillover Savings per Measure**

<table>
<thead>
<tr>
<th>Measure</th>
<th>kWh</th>
<th>kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFLs</td>
<td>1,760</td>
<td>0.055</td>
</tr>
<tr>
<td>ENERGY STAR Room A/C</td>
<td>844</td>
<td>0.845</td>
</tr>
<tr>
<td>Low-Flow Showerhead – Electric Water Heater</td>
<td>377</td>
<td>0.029</td>
</tr>
<tr>
<td>ENERGY STAR Dishwasher – Gas Water Heater</td>
<td>26.4</td>
<td>0.003</td>
</tr>
<tr>
<td>LEDs</td>
<td>17.7</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Total Spillover Savings</strong></td>
<td>3,025</td>
<td>0.932</td>
</tr>
<tr>
<td><strong>Total Verified Savings for Surveyed Sample</strong></td>
<td>443,100</td>
<td>54.4</td>
</tr>
<tr>
<td>% Spillover</td>
<td>0.68%</td>
<td>1.71%</td>
</tr>
</tbody>
</table>
4. Process Evaluation

The goals of the 2013 HAP process evaluation are to determine the effectiveness of program delivery by assessing the program’s marketing and outreach strategy, tracking systems, and interactions with participants, including the training and education program component. In February 2014, Opinion Dynamics released an interim report detailing preliminary process findings and recommendations for the HAP. Upon its completion, we continued to conduct process research, including interviews with social housing providers, an interview with a gas utility representative, additional analyses of the participant survey results, and a review of the HAP QA/QC process conducted by Bronson Consulting. Methodologies and results from this additional research, as well as key process findings from our preliminary report, are included in the following section. For details on our preliminary process findings, discussed in section 4.2.1, please see our interim report, titled Evaluation Report Home Assistance Program (2011-2012, with preliminary 2013 results).

4.1 Methodology

Our process evaluation involved the collection of both primary and secondary data sources. We gathered primary data through interviews with program staff, local distribution companies (LDCs), implementing agencies, social housing providers, a gas utility, and program participants. Table 10 summarizes these efforts in detail. In addition to these primary data collection efforts, this section also describes our review of a variety of program materials.

<table>
<thead>
<tr>
<th>Table 10. 2013 Primary Data Collection Efforts</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPA Program Staff</td>
</tr>
<tr>
<td>Completes</td>
</tr>
</tbody>
</table>

*Eight interviewees representing nine LDCs.

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

Opinion Dynamics conducted interviews with two OPA staff members—the HAP Lead and the OPA Compliance Manager—as well as the HAP administrators at eight LDCs, and two HAP delivery agents. The interviews gathered information on program design, delivery, and participation, and served six primary purposes:

1. To 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. To better understand participant outreach and education
3. To better understand the training and educational component that may drive behavioral changes
4. To better understand the tracking systems, quality assurance procedures, and audit process and documentation
5. To determine the level of cooperation between the LDCs and natural gas companies
6. To better understand alternative program technologies and designs that could be tested through our research

The Opinion Dynamics Project Manager conducted the OPA program staff interviews in person in October 2013. The Opinion Dynamics Project Manager and lead Project Analyst conducted the LDC and delivery agent interviews over the telephone in December 2013 and January 2014.

We completed interviews with eight LDC program administrators representing nine LDCs. These LDCs accounted for 42% of all participation in Q1-Q3 2013. Among the HAP administrators we interviewed, participation ranged from fewer than 100 participants to more than 1,000 participants. Geographically, the LDCs ranged throughout Ontario. Eight of the program administrators we interviewed described themselves as being the HAP Program Manager or Program Supervisor, and four described themselves as being the head of all conservation and demand management (CDM) programs at their respective LDCs. One program administrator oversees all residential programs at their LDC, one oversees all commercial programs at their LDC, and one was the head of the low-income sector for their LDC. Only one program administrator described himself or herself as being solely responsible for the HAP.

We also conducted two in-depth interviews with program delivery agents from Green Communities and GreenSaver, and one with program administrators at Enbridge Gas Distribution. These delivery agents provided installation services to more than half of the program participants.

4.1.2 Review of Program Materials and Data

Opinion Dynamics 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 our process assessment. The program materials reviewed included:

- Field Audit Support Tool (FAST), Versions 1 and 2.1
- Participant Education Guide
- Participant Application
- Eligibility Intake and Service Guidelines
- Process Flow Documents
- Audit and Retrofit Protocols
- OPA EM&V Protocols for 2011-2014
- HAP QA/QC Telephone Survey Template and Results for 2013 Review

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 ex ante savings. We were also able to characterize data quality and completeness by identifying duplicate records, missing data, and outliers. The
findings from this analysis also helped inform sample design parameters and potential sample design strata. More specifically, this analysis allows us to:

- **Understand Participation:** Opinion Dynamics used the results of the database analysis to help characterize HAP participation and savings. We reviewed and documented participant and measure counts, measure uptake, *ex ante* savings, and where the savings came from in terms of measures and LDCs.

- **Document Missing Data and Provide Recommendations for Future Tracking:** Through this effort, we also assessed the integrity of the databases. We looked for duplicates or errors in terms of applying the correct savings estimates and using the appropriate units of measurement, which are necessary first steps 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 our participant survey sample, we 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, Opinion Dynamics conducted a basic inventory and analysis of available participant data, including the removal of duplicates and identification of missing data; we used the corrected dataset to build sample frames for the surveys.

Opinion Dynamics completed an initial database analysis of 2013 participants through January 1st to August 31st, as data for September through December 2013 were not yet available when we conducted the participant survey. We used these data to develop our representative sample of 2013 participants used for the participant survey. When the September through December participant data were made available to us in early 2014, we then conducted additional analyses of the remaining participants, to determine if participants in September through December were different from those in the earlier part of the year in terms of energy and demand savings, measure mix, and other characteristics. We found no significant differences between participants from the two periods.

### 4.1.4 Participant Survey

Opinion Dynamics administered the participant survey by telephone from our call center between December 11 and 29, 2013. We completed interviews with 375 customers who participated in the HAP in Q1-Q3 of 2013. Below we discuss our survey instrument and sample design methodologies.

**Survey Instrument Design**

Participant surveys are a key component of assessing program impacts and effectiveness. We developed a HAP participant survey that enabled us to estimate program-level and measure category-level NTGRs; better understand the extent of non-energy benefits; and identify the effectiveness of the HAP from the participant perspective. Before developing the participant survey, we reviewed the past HAP participant surveys to see where data was already available and where we were able to leverage existing data, allowing us to shorten the survey and minimize survey fatigue. For example, existing quality assurance surveys included standard satisfaction survey questions that adequately cover participant satisfaction, such that we were able to leverage that existing data and did not need to further explore participant satisfaction in this survey.
We developed the participant survey in accordance with the STG-11 and STG-12 EM&V Protocols, which cover requirements for net-to-gross ratios (NTGRs) and market affects research and analysis. The survey includes questions that explore the following topics:

- **Impact related analysis:**
  - Verified installation/receipt of measures
  - Free ridership for each measure (if multiple measures were provided to a participant, we prioritized the least common measures to ensure that enough data was collected on each)
  - Spillover effects

- **Process relation analysis:**
  - Use of measures (to understand if assumptions for low-income participants need to be different than those from non-low-income participants)
  - Energy education received, and associated change in knowledge of energy efficiency
  - Behavior changes and/or additional installed measures directly attributable to the program's training and education efforts
  - How participants heard about the HAP, what outreach they received, and how influential it was to the decision-making process
  - Non-energy benefits realized by participants
  - Extent that participants promote energy-saving practices to non-participants
  - Participant profile information such as demographics, geography, housing characteristics, and other key characteristics that could be used for future outreach and marketing efforts
  - Motivations for HAP participation and customer decision-making process

The full survey instrument is provided as Appendix D to this report.

**Sample Design**

To best support the NTGR analysis, Opinion Dynamics used a sampling approach that prioritized the less common measures, such as block heater timers and weatherization measures. We assigned each measures to seven categories by measure type: lighting, block heater timers, appliances (refrigerators and freezers), air conditioning (room A/C units and dehumidifiers), weatherization, programmable thermostats, and hot water measures (faucet aerators, showerheads, pipe wraps, and tank wraps). Measures identified as less common were given higher priority in the sample. For a complete list of measures and their associated measure group, see Appendix A.

The sampling unit for the survey was the project contact. We asked each contact about up to three installed measures. In cases where a single contact received more than three measures, we selected three measures, giving priority to the least-frequent measures installed by the program.
Our sample frame included 11,186 unique contacts who participating in the HAP from January to August of 2013. Of these, 6,695 records had telephone numbers associated with them. After cleaning incomplete or erroneous phone numbers, our final sample included 5,982 unique contacts. Due to the small number of contacts in certain measure groups, we attempted a census of contacts with measures in the block heater timer, air conditioning, programmable thermostats, and weatherization measure groups. We completed 375 interviews, using 3,005 pieces of the sample. Table 11 shows the survey dispositions for all telephone numbers we dialed. The survey response rate was 14.7%, which is a high response rate for telephone surveys of efficiency program participants.

We calculated the response rate 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 formulas used to calculate RR3 are presented below. Table 11 below, displays the definitions of the letters used in the formulas.

\[ E = \frac{(I + R + NC)}{(I + R + NC + e)} \]

\[ RR3 = \frac{I}{((I + R + NC) + (E*U))} \]

Table 11. Survey Dispositions and Response Rate

<table>
<thead>
<tr>
<th>Disposition</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed Interviews (I)</td>
<td>375</td>
</tr>
<tr>
<td>Eligible Non-Interviews</td>
<td>1,787</td>
</tr>
<tr>
<td>Refusal (R)</td>
<td>551</td>
</tr>
<tr>
<td>Mid-Interview Terminate (R)</td>
<td>34</td>
</tr>
<tr>
<td>Respondent Never Available (NC)</td>
<td>414</td>
</tr>
<tr>
<td>Telephone Answering Device (NC)</td>
<td>721</td>
</tr>
<tr>
<td>Language Problem (NC)</td>
<td>47</td>
</tr>
<tr>
<td>Callback to Complete (NC)</td>
<td>20</td>
</tr>
<tr>
<td>Not Eligible (e)</td>
<td>389</td>
</tr>
<tr>
<td>Duplicate Number</td>
<td>6</td>
</tr>
<tr>
<td>Fax/Data Line</td>
<td>37</td>
</tr>
<tr>
<td>Non-Working</td>
<td>252</td>
</tr>
<tr>
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Total Participants in Sample            3,005

Source: 2013 HAP Participant Survey—Preliminary Results.

4.1.5 Social Housing Provider In-Depth Interviews

Opinion Dynamics conducted in-depth interviews with 21 representatives of social housing providers throughout Ontario. We developed an in-depth interview guide to obtain information similar to that obtained from participants, though we placed more emphasis on soliciting open-ended responses where appropriate. We conducted most of the interviews with building managers who were responsible for either a single property or multiple properties on behalf of a larger social housing organization.

We identified potential social housing providers after analyzing participant data and the responses obtained from our survey of HAP participants. Based on responses to our participant survey, we identified customers that may live in social housing communities—renters, customers that had their utility bills paid for them, and those that were signed up for the program by a building manager or landlord. After compiling a list of participants that met multiple criteria, we sent a list of the unique addresses to the OPA for verification that a social housing provider managed those units. Our final sample included a list of 65 social housing communities—verified by the OPA and the LDCs—as well as the associated building manager information. Each community in the sample represented one or more HAP participants completing the participant survey.

4.2 Results

This section discusses the results of our full process evaluation, including some of the key process findings from our report released in February 2014.

4.2.1 Key Findings from Preliminary 2013 Results Report

In February 2014, Opinion Dynamics released a report with preliminary findings for our 2013 process evaluation. Upon its completion, we continued to conduct process-related research informed, in part, by the findings discussed below. We based our results on data collection efforts during late 2013 and early 2014. The following points summarize several of the key findings and major recommendations from this interim report:

- Results from our survey and interviews indicated a high level of satisfaction with energy audits and energy-saving measures provided by the HAP.
- LDCs expressed some dissatisfaction with certain aspects of the program, such as burdensome paperwork, relatively low demand savings compared to other programs, and difficulty identifying low-income customers that are eligible for the HAP.
- Program participation met its 2013 goals; however, the majority of participation has come from customers living in social housing communities. LDCs and implementation agents expressed concern that this portion of the eligible market may become saturated in coming years, which will pose challenges for increasing participation, and may increase program costs.

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Furthermore, LDCs and implementation agents believe that, even though social housing participation appears to be approaching saturation, a large percentage of the market eligible to participate in the HAP is still relatively untapped. As such, HAP participation remains low compared with the eligible market. Budgetary constraints have limited the effectiveness of marketing and outreach efforts outside of social housing communities for a number of LDCs.

Our interviews highlighted some issues with the OPA’s FAST, including deemed savings values and export features. In addition, we found discrepancies between some of the measure cost caps found in the FAST and the actual costs realized by LDCs and delivery agents—such as room air conditioners, 60-Watt equivalent, and 100-Watt equivalent CFLs.

4.2.2 Key Findings from Interviews with Social Housing Providers

As part of our process evaluation, we completed in-depth interviews with 21 representatives of social housing organizations, most of whom were building or property managers responsible for one or more properties. We conducted these interviews primarily to inform our NTGR estimates by determining the extent to which social housing providers control the installation of energy-efficient measures, and are potential sources of free ridership and spillover. The interviews also provided anecdotal evidence supporting some of the key findings identified through the participant surveys and stakeholder interviews.

Social housing communities have been a great resource for driving program participation, specifically by providing a vehicle for reaching and signing eligible customers up for the program. Our analysis of the HAP participant database showed that roughly 77% of program participants originate from social, or assisted living facilities run by government entities or by non-profit groups. Interviews with property managers supported this finding. Of the 21 interviews we completed, 11 property managers reported that they signed tenants up for the program directly, while two other interviewees were instrumental in signing tenants up either by providing information on the HAP or by sponsoring an event with a program representative. Though social housing providers can be a great resource for reaching eligible customers, it is important to note that, in many instances, customers are responsible for equipment that HAP measures will replace. Our interviews with building managers also indicated that the vast majority of tenants (86%) were responsible for the measures provided through the program—that is, they had the ability to turn down HAP audits and measure installations. Working directly with social housing organizations has proven beneficial in terms of increasing program participation, and reducing the costs of delivering the program by leveraging the economies of scale associated with servicing multi-unit buildings.

Our interviews indicated that some social housing communities have made efforts to upgrade inefficient equipment on their own, particularly offering free or subsidized CFLs to residents; however, the HAP appears to have accelerated these upgrades. Additionally, as capital budgets for these organizations are typically limited, the presence of the HAP allows them to address additional measures that they may not have ever provided to their residents. One building manager described this scenario:

“We started this program two years prior to Green Saver starting this, where we were going and changing all the incandescent light bulbs in all our tenants’ units... to CFLs, so we had actually already started that...but we didn’t replace every single one. We just replaced so many per unit per year... You know, and then when [the Home Assistance Program] came along it was just great, because they were also replacing the tri-lights as well, which are very expensive, something we weren’t doing.” (Property Manager)
Property managers also spoke highly of the educational component of the HAP. While some interviews highlighted inconsistencies in the training and education provided to residents, many cited the importance of this component, both in terms of keeping HAP measures installed, and for residents to be more conscious about managing their energy use. One interviewee explained:

"I kind of hoped that that sort of information would get out and people would take advantage of it. In some instances I think they did, where they were paying high hydro bills and you know, they would get some pointers about turning down their hot water tank and different stuff like that. That sort of information is appreciated and required...So I support it and I wish there would be more of it." (Property Manager)

Some property managers allocated their own facility personnel to provide additional support to tenants to ensure that the program and its benefits were effectively communicated to residents. As one respondent described it:

"Because we own the appliances, not the tenants in the building, we said we want our appliances audited and while they're there and auditing our appliances, they'll also replace light bulbs and everything, and then we have one of our staff accompany the auditors to go around to make sure that they had access and proper notices were given and whatnot. It was actually quite time-consuming on our part, but at the end of the day, the tenants got an education on the [Home Assistance Program] and on energy consumption in general." (Property Manager)

Interviews with property managers indicated that many social housing organizations allocate resources to improving the energy efficiency of their facilities, and providing some education to tenants. Some organizations may provide workshops to influence tenant behavior, while others have provided free energy efficiency upgrades in the past. Continuing to engage property managers and other decision-makers within social housing communities to leverage these resources may be an important strategy as program administrators look to improve upon the success of the HAP.

4.2.3 Key Findings from HAP QA/QC Review

Separate from our efforts to evaluate the HAP, the OPA commissioned a quality assurance and quality control study for 2013. The study, completed by Bronson Consulting, consisted of a phone survey and on-site inspections; 101 phone surveys (50 in Q1 and 51 in Q2) and 8 on-site assessments were completed. Survey questions were broken up into five different categories—recipient eligibility, energy audit, measure verification, customer service, and general impressions—which attempted to obtain information on corresponding aspects of the HAP’s service delivery process. Bronson Consulting completed all sampling and analysis. Below, we describe key results related to participant satisfaction.

According to the report, the majority of respondents—among both those that received basic measures and those received extended measures—reported being very satisfied with the HAP. While there were some complaints about extended measures, largely for refrigerators being either too small or too noisy, the vast majority of respondents receiving extended measures reported very high levels of satisfaction with the program. Customers were asked to rate their level of satisfaction on a scale from 1 to 5, 5 being most satisfied. Of 59 total respondents that received extended measures, 69% described their level of satisfaction as either 4 or 5. Figure 2 shows the range of responses to this satisfaction question from respondents receiving extended measures.
4.3 Recommendations

Opinion Dynamics provides several recommendations below, based on the findings discussed in Section 4.2. We also presented several of these recommendations in detail in our February 2014 report containing the results of our preliminary process evaluation.

- **The OPA should standardize service delivery, specifically auditor training requirements, and work to leverage alternative strategies employed by LDCs, and other local partners working in the low-income community.**

In our preliminary process evaluation, released in February of 2014, we reported on the varied, and often innovative, approaches different LDCs have adopted for delivering the HAP. While some variations are particular to the unique characteristics of the LDCs’ customers or their contracts with delivery agents, others may be applied broadly to the program’s overall delivery.

Based upon discussions with the program administrators and delivery agents, there is no universal agreement on the qualifications of the HAP auditors; and, as audit costs represent a substantial portion of overall program costs, some stakeholders felt that the requirements for certified energy auditors specified in the original program documentation might not be the best use of program resources. The OPA should clearly define the experience level and auditor certification requirements—including auditor training protocols—as LDC interpretations of these requirements vary. When creating these requirements, the OPA should note that certified energy auditors may not be required for all types of HAP audits—that is, experienced technicians may be adequate for performing basic HAP audits and may help reduce program costs for some LDCs.

Furthermore, LDCs and delivery agents reported that fostering strong partnerships with local non-profit agencies that are already working with low-income residents is a key to successful implementation of the HAP. This delivery strategy is also consistent with industry best practices for...
implementing low-income programs. Such agencies include the Salvation Army, the Enviro Center, and local food banks and churches. The OPA should encourage LDCs to leverage these local resources by using existing customer intake systems whenever possible—such as local aid agencies, social services offices, and food pantries—to identify and recruit program participants.

- **The OPA should consider increasing the $10 referral incentive to encourage greater collaboration with local aid agencies, or provide LDCs with designated marketing budgets, to increase the overall outreach capacity of the HAP.**

The amount and success of marketing and outreach varied among the LDCs, though no program administrator reported having a comprehensive marketing or outreach plan. Instead, administrators conduct marketing and outreach for the HAP on an ad hoc basis. Seven out of eight program administrators reported that there was no dedicated marketing or outreach budget outside of the $10 referral incentive, and any funds used for marketing and outreach come out of their program administration budget, which they stated is already very tight.

As LDCs look less towards social housing facilities for new program participants, marketing and outreach will become more important in identifying and recruiting eligible participants. The OPA should consider increasing the referral incentive to encourage local aid agencies to collaborate with the LDCs and delivery agents in identifying and marketing the HAP to qualified customers. The OPA should also consider providing the LDCs with designated marketing budgets, as well as creating a province-wide list of best practices based on examples from LDCs that have created successful marketing and outreach plans.

- **The OPA should reinforce the educational component of the HAP by providing specific guidance to LDCs and delivery agents on the program’s educational requirements and best practices.**

The Low Income Initiative includes an education and training component, which may produce additional program-attributable savings by motivating participants to take further energy-saving actions after initial program participation. At least some participant education is being provided by most LDCs, but the level of participant education varied across the LDCs; some program managers provided detailed descriptions of participant education efforts while others gave short descriptions of their efforts. Some felt that this is a very important part of the services provided by the program and others felt that it was less important.

The OPA should reinforce this component of the HAP, and provide specific guidance to LDCs and delivery agents on best practices for auditors. Some LDCs and delivery agents have been more active at engaging customers and creating educational materials. The OPA should leverage these resources to create standard measure-specific “leave behind” materials that delivery agents and LDCs can provide to participants based on their unique needs and the measures installed.

This recommendation is particularly relevant for programmable thermostats, as our analysis revealed low rates of customers actually programming the thermostats they receive. The installation verification rate—the ratio of what customers reported receiving to what the OPA tracked—for programmable thermostats was roughly 94%. For our analysis, we factored in an additional question that asked respondents if their thermostat had been programmed. After removing those respondents that said neither they nor a program representative had programmed their thermostat, this rate fell to 63%.
Some instruction on programming the thermostat, and communicating the benefits of doing so, may help alleviate this issue.

- **The OPA should modify some of its data management practices—that is, consider adopting new technology to append and integrate HAP data with customer information and/or tracking customer data at the participant, project, and site-level.**

The OPA should develop and distribute a tool, such as an Excel macro, that will convert the current FAST-generated PBR export into a file that can interact with OPA’s CRM system for easier upload and billing management. In addition, the OPA and the HAP stakeholders should consider the pros and cons of adopting London Hydro’s Dragon software (or something similar) to integrate all program data management and billing systems.

Furthermore, it is our recommendation that the OPA and LDCs track three different unique identifiers to solve data quality issues, such as duplicate records. In addition to the FAST file ID, which captures the unique project, the OPA should also track a unique ID that captures the unique customer (such as a customer account number), and another that tracks the project’s physical location. In lieu of releasing sensitive customer information such as names and physical address, this is would be one way of ensuring that each project is unique, and would provide backup unique identifiers for evaluators to ensure the most accurate ex-post analysis.

Finally, the OPA should consider using different methods of aggregating data into its final HAP dataset to avoid potential errors in standardization of formatting and data alignment. We found several issues during our data cleaning process, with certain data columns being misaligned and a wide range of date formats. These types of issues may result from copying and pasting large swaths of data from one Excel sheet to another, and can potentially be problematic in the future. The OPA should consider another software alternative for aggregating large datasets, one that would not allow the manipulation of individual records before exporting the information into Excel to calculate savings and conduct other analysis at the measure, project, or program level.

- **The OPA should establish direct communication with, and work to leverage the resources of, various HAP stakeholders—such as delivery agents, local aid agencies, gas utilities, and other organizations working with low-income communities.**

We asked program administrators and delivery agents a series of questions on organizational relationships between the LDCs, delivery agents, and gas utilities. Of the LDCs interviewed, three contracted with GreenSaver for program delivery, three contracted with Honeywell, one contracted with Wilde Ridge, and one delivered the HAP program in-house. In two instances, Honeywell subcontracted the fieldwork to local non-profit organizations, as, according to program administrators, they were received better by communities participating in the HAP.

The OPA should establish direct communication with and work to leverage the resources of various HAP stakeholders. With three delivery agents implementing the HAP for all but a few LDCs, direct communication between OPA and the delivery agents (in addition to the LDCs) will reduce delays and miscommunication of information that could require substantive changes to the program’s delivery. Furthermore, the OPA should establish clear lines of communication with gas utilities to coordinate
delivery and leverage additional resources, as there is substantial overlap between customers eligible for gas savings measures and the HAP.

- **The OPA should work to reduce the administrative burden on customers, delivery agents, LDCs, and OPA program staff—specifically regarding customer sign-up, as well as LDC and delivery agent reimbursement processes.**

  We recommend that the OPA conduct a review of its processes in both of these areas to identify excess data collection, multiple entries of the same information, and confusing and unclear language. We also recommend developing a billing and payment process flowchart to highlight and prioritize opportunities for streamlining processes.

  In addition, we recommend that the OPA update savings and cost information at the measure level, and, as suggested by program staff, consider offering additional measures such as LEDs and air-to-air heat pumps. Furthermore, the OPA should consider transitioning to deemed savings values for weatherization measures, eliminating the need for the HOT2000 tool in favor of potentially using a simpler algorithm with easy-to-measure building characteristics as inputs.

  Finally, HAP stakeholders generally agreed that the project-level Total Resource Cost (TRC) Test is creating significant challenges in implementing the program. Most felt that meeting the TRC of 1.0 for all projects cumulatively over the course of the year would result in similar overall cost-effectiveness, and would provide them with needed flexibility.
5. Savings Assumption Development and Review

As part of our 2011/2012 program year evaluation, Opinion Dynamics completed a review of the HAP deemed savings assumptions for non-weatherization measures that accounted for more than 1% of the total program savings. The program does not deem weatherization measures; instead, they are calculated through HOT2000 modelling by the implementation agents. Opinion Dynamics did not review the savings calculations and models for the weatherization measures, other than to update the kW savings ratios by applying the methods in the OPA EM&V Protocols (STG-10).

For the 2013 evaluation, we reviewed the measure-level savings to determine if any of the measures that we did not review for the 2011/2012 evaluation now account for a significant share of savings. We found relatively little change in the overall measure mix between 2013 and 2011/2012 and did not review more measures.

However, Opinion Dynamics did update the demand savings estimates for electric furnace programmable thermostats. The deemed demand savings values recommended in the 2011/2012 evaluation were found to be overestimating demand savings for this measure.

Recommendations

The updated list of our recommended deemed savings values for both energy and demand savings is included in 0. The OPA has updated the deemed savings values used in the FAST to the recommended values. This will allow the LDCs to accurately track their progress toward their savings goals going forward. In addition, these changes will also affect the accuracy of the TRC values produced by FAST.

Weatherization measures together account for 10% and 37% of energy and demand savings, respectively. Opinion Dynamics recommends evaluating a sample of recent HAP weatherization projects by reviewing all associated project files and model inputs, and models to develop a realization rate for these measures. This analysis should also explore whether deemed savings values for weatherization measures are feasible for the HAP.
## Appendix A. Measures and Measure Categories

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<th>Measure Category</th>
<th>HAP Measure</th>
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<td>ENERGY STAR® Qualified CFL-PAR38 (100W Outdoor)</td>
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<td>ENERGY STAR® Qualified CFL-Covered A19 (60W)</td>
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<td>Block Heater Timer</td>
<td>Block Heater Timer (Just Timer)</td>
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<td>10</td>
<td>Power Bar</td>
<td>Power Bar With Integrated Timer</td>
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Appendix B. Program Manager Interview Guide

This interview guide will be used to support the process evaluation of the OPA’s Low Income Initiative. The interviews will be conducted by Opinion Dynamics staff. We will complete 1-2 interviews with OPA Program Managers, identified by the OPA as the best resources of information regarding the Low Income Initiative.

These interviews will serve six primary purposes:

(1) to 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) to better understand participant outreach and education

(3) to better understand the training component that may drive additional behavioral changes in 2013 and 2014

(4) to better understand the tracking systems, quality assurance procedures, and audit process and documentation

(5) to assess the level of cooperation between the LDCs and natural gas companies

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

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<td>Time Start:</td>
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<td>Time Finished:</td>
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Introduction

Hi, may I please speak with [NAME]?

My name is ___ and I'm calling from Opinion Dynamics Corporation, an evaluation firm working on behalf of the Ontario Power Authority, “OPA.” We’re talking to program managers who currently administer the OPA’s Low Income Initiative or Home Assistance Program.

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

The questions that I have should only take about 30 minutes and your responses will be kept strictly confidential and will only be presented at the aggregate level.

Is this a good time to talk? [IF NO, SCHEDULE A CALL BACK.]

S1. Our records show that you are currently a program manager for the OPA Low Income Initiative. Is this correct?

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

Background

B1. What is your role at the OPA?

B2. Please tell me about your involvement and role with the HAP.

B3. Were there any barriers or challenges associated with the OPA beginning to implement the Initiative?

B4. What are the approximate 2013 participation levels in the program for both participants and LDCs? Has participation met your expectations? If not, why?

B5. Does the OPA have specific goals for participation, savings, or cost-effectiveness for HAP?

B5a. What are the primary energy and non-energy goals of the Initiative?

B5b. Are you on track to meet these goals?

B5c. What are the main challenges for the OPA in attaining these goals?

B6. To your knowledge, does the Low Income Initiatives program’s design (including incentive structure, audit requirements, verification and reporting) present any barriers that may prevent you from implementing the program as you would like? If so, please describe.

B7. In your opinion, does the program have the financial (i.e., budget) and staff resources needed to reach its goals?
Organization Relationships

R1. In addition to the LDCs and the delivery agents, what other organizations are involved with implementing the program and what are their specific roles? How do they interact?

R2. How many delivery agents are helping to implement the program?

R3. Can you describe the role of the gas companies in promoting and implementing the program??

R2a. How effective is communication and cooperation between OPA and other participating organizations and stakeholders, such as the natural gas companies?

R2b. What are the primary areas for improvement?

R3. Can you describe the working relationship between the OPA and the LDCs?

R3a. What is working?

R3b. What is not working?

R4. In your opinion, what are the main barriers to LDCs participating in the program? Does this vary by LDC size, geography, other? What do you think can be done to overcome these barriers?

R5. How much interaction does OPA have with the delivery agents? Are the LDCs the first point of contact, or does OPA interact directly with the delivery agents?

R6. We will be conducting interviews with both LDCs and the delivery agents and would like help in identifying the right contacts who can discuss the HAP with us. Can you provide us a list of all of the LDC contacts? Can you provide us with a list of all of the delivery agents involved with the HAP?

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

M1. Can you describe the primary means of gaining participation in the HAP?

M2. Do you have a marketing approach or plan for the program? If so, please describe.

M3. What sorts of marketing and outreach does OPA do itself? LDCs? Delivery agents? Others? What are Blitz participants?

M4. How does OPA support (i.e., funding and other assistance) the marketing done by these organizations?

M3. 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? Specify)

M4. What do you think are the most successful channels for generating participation? How are these channels being used?
M5. Is there any support you would like to receive from the LDCs related to marketing?

M6. How is the marketing budget determined?

Program Data Collection, Processing and Tracking

D1. What application forms are used?
   D1a. Were these forms developed by the LDCs or the OPA?
   D1b. Is the information from these forms entered into a database?
   D1c. Is the information from the applications provided to OPA by the LDCs?

D2. Can you describe the LDC’s and delivery agents’ use of the Field Audit Support Tool (FAST)?
   D2a. How are auditors trained on the use of the tool? How do you ensure that all auditors are adequately trained?
   D2b. How well of a job do you feel the FAST does in identifying cost effective measures? Why?
   D2c. How well of a job do you feel the FAST does in estimating measure electricity and demand savings? Why?
   D2d. What is the process for transferring FAST results to OPA?
   D2e. Are there any changes that you are aware of that need to be made to the FAST?
   D2f. Who revises the tool and how does OPA ensure that all LDCs and delivery agents are using the most current version?

D3. Can you describe the weatherization audits?
   D3a. What data collection tools are used? How are auditors trained on conducting these audits and using the tools?
   D3b. Are the weatherization savings estimated using the HOT2000 model? Who does this modeling?
   D3c. Does the OPA do any QA/QC on the model results?
   D3d. Where are the modeling files maintained? Does the OPA get the modeling files from the LDCs?
   D3e. How do the LDCs bill the OPA for the weatherization audits and any measures installed during the weatherization audits?

D4. What other information is collected from participants and home audits?
   D4a. Where is this information compiled and maintained? By whom?

D5. Describe the verification process.
D5a. When are verification audits conducted? By whom? Are they specific to weatherization measures only?

D5b. What information is collected during the verification audits?

D5c. What forms are used? Can we review examples of completed forms?

D5d. How is the information from the verifications used?

D6. Describe the reimbursement process.

D6a. How do the LDCs submit to the OPA for reimbursement of measures? What forms are filled out and submitted?

D6b. Does the OPA provide reimbursement for outreach and marketing? If yes, how does that process work?

Participant Experience

E1. What portion of participants are in multifamily buildings? How does the HAS interact with building owners and managers?

E2. Are the building owners and managers also considered participants?

E3. Is the building owners’ and managers’ contact information recorded? Where is this information maintained?

E4. Can you describe how the LDCs are supposed to use the Participant Engagement Guide?

E4a. How are auditors trained in participant engagement?

E4b. Are there materials that are left behind with the participants after the audit? Can we review these materials?

E5. How is participant engagement verified?

E5a. Does OPA use a follow-up customer satisfaction survey? How is this implemented? What kinds of participant feedback has OPA received?

E6. Have participants requested any additional measure types? Are any additional measures or incentives being considered, or a restructuring of existing ones?

Conclusion

F1. Finally, do you have any other comments or recommendations concerning the HAP that you would like to share?
Appendix C. LDC Interview Guide

This interview guide will be used to support the process evaluation of OPA’s Low Income Initiative. The interviews will be conducted by Opinion Dynamics staff primarily by telephone. We will complete 10-12 interviews with a selected group of LDCs implementing the Initiative that will vary by size and geography.

These interviews will serve six primary purposes:

1. To 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. To better understand participant outreach and education
3. To better understand the training component that may drive additional behavioral changes in 2013 and 2014
4. To better understand the tracking systems, quality assurance procedures, and audit process and documentation
5. To assess the level of cooperation between the LDCs and natural gas companies
6. To identify potential alternative program technologies and designs that could be tested through our research.

<table>
<thead>
<tr>
<th>Respondent name:</th>
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<tbody>
<tr>
<td>Respondent phone number:</td>
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<tr>
<td>Respondent title:</td>
</tr>
<tr>
<td>LDC name:</td>
</tr>
<tr>
<td>Interviewer:</td>
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<tr>
<td>Date:</td>
</tr>
<tr>
<td>Time Start:</td>
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<td>Time Finished:</td>
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</table>
Introduction

Hi, may I please speak with [NAME]?

My name is ___ and I’m calling from Opinion Dynamics Corporation, an evaluation firm working on behalf of the Ontario Power Authority, “OPA.” We’re talking to LDCs who currently offer the Low Income Initiative or Home Assistance Program.

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

The questions that I have should only take about 30 minutes and your responses will be kept strictly confidential and will only be presented at the aggregate level.

Is this a good time to talk? [IF NO, SCHEDULE A CALL BACK.]

S1. Our records show that you are currently the contact at [LDC] for the Low Income Initiative. Is this correct? [IF S1 = NO, COLLECT CONTACT INFORMATION FOR THE CORRECT PERSON.]

Background

B1. What is your role at [LDC]?

B2. How many residential customers does [LDC] serve? How does this compare to other LDCs in Ontario?

B3. How many of those residential customers in [LDC]’s territory are low-income?

B4. Are there any characteristics of this population that you think may be unique or different from most other LDCs?

B5. Please tell me about your involvement and role with the Low Income Initiative.

B6. When did [LDC] begin to implement the Initiative?

B7. Were there any barriers or challenges associated with getting [LDC] to implement the Initiative?

B8. What types of information, materials, guidance, or tools did OPA provide to you to help implement the program?

Organization Relationships

R1. What organizations are involved with implementing the program for [LDC] and what are their specific roles?

R2. Do you work with any other organizations as part of the Low Income Initiative? What are their roles? [PROBE FOR MARKETING ORGANIZATIONS, OUTREACH ORGANIZATIONS, ETC.]
R3. Have you engaged the gas utilities to deliver the program in market?

R3a. How effective is communication between Initiative implementation staff and participating organizations and stakeholders, such as the Natural Gas Companies?

R3b. What are the primary areas for improvement?

R4. Can you describe the working relationship between your organization and the OPA?

R4a. What are your respective roles in implementing the programs?

R4b. What is working?

R4c. What is not working?

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

M1. How do you recruit participants? What resources do you use to recruit participants into the Low Income Initiative?

M2. Do you have a marketing approach or plan in mind for the program? If so, please describe.

M3. 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? Specify)

M4. What are the most successful channels for generating participation? How are these channels being used?

M5. Has the OPA provided any kind of marketing materials or support?

M6. Is there any support you would like to receive from the OPA related to marketing?

M7. How is the marketing budget determined?

Program Data Collection, Processing and Tracking

D1. Do all participants complete an application form for the basic audit?

D1a. Is the information from these forms entered into a database?

D1b. Is the information from the applications provided to [LDC]?

D2. Can you describe the [LDC]'s use of the Field Audit Support Tool (FAST)?

D2a. How are auditors trained on the use of the tool? How do you ensure that all auditors are adequately trained?

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

D2c. How well of a job do you feel the FAST does in estimating measure electricity and demand savings? Why?
D2d. Other than identifying eligible measures, forecasting electricity and demand savings, and developing billing reports, how else does [LDC] use the FAST results?

D2e. What is the process for transferring FAST results to OPA?

D2f. Are there any changes you would make to the FAST?

D3. Describe the Extended Audits and the information collected.

D3a. What data collection tools are used? How are auditors trained on these conducting these audits and using the tools?

D3b. How is the Field Audit Support Tool used for weatherization measures?

D3c. Are the weatherization savings estimated using the HOT2000 model? Who does this modeling?

D3c. Does [LDC] do any QA/QC on the model results?

D3e. Where are the modeling files maintained?

D3f. Is the information from the HOT2000 model entered into the FAST?

D3g. Are the models and FAST updated for this project following the post-weatherization verification audit, if necessary?

D3h. In general, what do you think about how FAST handles weatherization measures?

D4. What other information is collected from participants and home audits?

D4a. Where is this information compiled and maintained? By whom?

D5. Describe the verification process.

D5a. When are verification audits conducted? By whom?

D5b. What information is collected during the verification audits?

D5c. What forms are used? Can we review examples of completed forms?

D5d. How is the information from the verifications used?

D6. Describe the reimbursement process.

D6a. How does [LDC] submit to the OPA for reimbursement of measures? What forms are filled out and submitted?

D6b. Does the OPA provide reimbursement for outreach and marketing? If yes, how does that process work?

Participant Experience
E1. Can you describe the [LDC]’s use of the Participant Engagement Guide?

E1a. How are auditors training in participant engagement?

E1b. Are there materials that are left behind with the participants after the audit? Can we review these materials?

E2. How is participant engagement verified?

E2a. Does [LDC] use any sort of follow-up customer satisfaction survey? If not, has there been any anecdotal customer feedback?

E2b.

E3. Has there been any request for additional measure types? Specify.

E3a. Are any additional measures or incentives being considered?

E3b. Do you feel that any existing measures needed to be restructured? [PROBE FOR RESTRUCTURING OF SAVINGS ASSUMPTIONS, MEASURE COST, TRC TEST, ETC]

E3c. Do you feel the Program’s measure cost caps or unit energy savings values influence the measure mix that is being installed? Why do you think this is? Are there any specific measures that you think should be revised?

LDC Participation in Program

L1. Does [LDC] have specific goals for participation in the Low Income Initiative?

L1a. What are the primary energy and non-energy goals of the Initiative?

L1b. Are you on track to meet these goals?

L1c. What are the main challenges for [LDC] in attaining these goals?

L2. To your knowledge, does the Low Income Initiatives program’s design (including incentive structure, audit requirements, verification and reporting) present any barriers that may prevent you from implementing the program as you would like? If so, please describe.

L3. Finally, do you have any other comments or recommendations concerning the OPA’s Low Income Initiative that you would like to share?
Appendix D. Delivery Agent Interview Guide

This interview guide will be used to support the process evaluation of OPA’s Low Income Initiative. The interviews will be conducted by telephone by Opinion Dynamics staff. We will complete in-depth interviews with delivery agent managers implementing the Initiative.

These interviews will serve six 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 tracking systems, quality assurance procedures, and audit process and documentation
4. to identify potential alternative program technologies and designs that could be tested through our research
5. to identify site auditors with delivery agents for further in-depth interviews.

| Respondent name: | 
| Respondent phone number: |
| Respondent title: |
| Company name: |
| Interviewer: |
| Date: |
| Time Start: |
| Time Finished: |
Introduction

Hi, may I please speak with [NAME]?

My name is ___ and I’m calling from Opinion Dynamics Corporation, an evaluation firm working on behalf of the Ontario Power Authority, “OPA.” We’re talking to organizations who contract with LDCs to offer the Low Income Initiative or Home Assistance Program.

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

The questions that I have should only take about 30 minutes and your responses will be kept strictly confidential and will only be presented at the aggregate level.

Is this a good time to talk? [IF NO, SCHEDULE A CALL BACK.]

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.]

Background

B1. What is your role at [DELIVERY AGENT]?

B2. Please tell me about your involvement and role with the Home Assistance Program.

B3. About how many LDCs have you contracted with to provide the Home Assistance Program?

B4. Are your contracts with each LDC different? What are the biggest difference?

B5. Can you describe the working relationship between [DELIVERY AGENT] and LDCs?

B5a. What are your respective roles in implementing the programs?

B5b. What is working?

B5c. What is not working?

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 provide to you to help implement the program?

Organization Relationships
R1. Other than the LDCs and OPA, 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 Initiative implementation staff and participating organizations and stakeholders, such as the natural gas companies?

R2b. What are the primary areas for improvement?

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

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. Has the OPA provided any kind of marketing materials or support? [ASK FOR EXAMPLES]

M7. Have the LDCs provided any kind of marketing materials or support? [ASK FOR EXAMPLES]

M8. Is there any support you would like to receive from the OPA or the LDCs related to marketing?

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 auditors trained on the use of the tool? How do you ensure that all auditors are adequately trained?

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

D2c. How well of a job do you feel the FAST does in estimating measure energy and demand savings? Why?
D2d. Other than identifying eligible measures, forecasting savings, and developing billing reports, how else does [DELIVERY AGENT] use the FAST results?

D2e. What is the process for transferring FAST results to the LDCs?

D2f. Are there any changes you would make to the FAST and/or the process for transferring information to the LDCs?

D3. Describe the Extended Audits and the information collected.

D3a. What data collection tools are used? How are auditors trained on these conducting these audits and using the tools?

D3b. How is the Field Audit Support Tool used for weatherization measures?

D3c. Are the weatherization savings estimated using the HOT2000 model? Who does this modeling?

D3c. Does [DELIVERY AGENT] do any QA/QC on the model results?

D3e. Where are the modeling files maintained?

D3f. Is the information from the HOT2000 model entered into the FAST?

D3g. Are the models and FAST updated for this project following the post-weatherization verification audit, if necessary?

D3h. In general, what do you think about how FAST handles weatherization measures?

D4. 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?

D5. Describe the verification process.

D5a. When are verification audits conducted? By whom?

D5b. What information is collected during the verification audits?

D5c. What forms are used? Can we review examples of completed forms?

D5d. How is the information from the verifications used?

D6. Describe the reimbursement process.

D6a. How does [DELIVERY AGENT] submit requests for reimbursement of measures to the LDCs?

D6b. Do the LDCs provide reimbursement for outreach and marketing? If yes, how does that process work?

Participant Experience

E1. Can you describe [DELIVERY AGENTS]’s use of the Participant Engagement Guide?
E1a. How are auditors trained in participant engagement?

E1b. Are there materials that are left behind with the participants after the audit? Can we review these materials?

E2. How is participant engagement verified?

E2a. Does [DELIVERY AGENT] use any sort of follow-up customer satisfaction survey? If not, has there been any anecdotal customer feedback?

E3. Do the auditors install basic measures, or are they left behind for the participant to install?

E3a. [IF MEASURES ARE LEFT BEHIND] Is there any instruction on how to install the basic measures or where to install them?

E4. Are the current measure offerings adequate?

E4a. Are there any other cost-effective measures that should be offered?

E4b. Do you feel that any existing measures needed to be restructured? [PROBE FOR RESTRUCTURING OF SAVINGS ASSUMPTIONS, MEASURE COST, TRC TEST, ETC]

E4c. Do you feel the Program’s measure cost caps or unit energy savings values influence the measure mix that is being installed? Why do you think this is? Are there any specific measures that you think should be revised?

Delivery Agent Participation in Program

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

L1a. What are the primary energy and non-energy goals of the Initiative?

L1b. Are you on track to meet these goals?

L1c. What are the main challenges for [DELIVERY AGENT] in attaining these goals?

L2. To your knowledge, does the HAP’s design (including incentive structure, audit requirements, verification and reporting) present any barriers that may prevent you from implementing the program as you would like? If so, please describe.

L3. As part of this evaluation, we would love to discuss the program’s implementation with your field technicians. Would you be willing to provide us contact information for the technicians most experienced in implementing the program? [RECORD CONTACT INFORMATION]

L4. Finally, do you have any other comments or recommendations concerning the HAP that you would like to share?
Appendix E. Participant Survey

SURVEY FIELDS

NAME – Customer name
LDC – Local distribution company
CONTRACTOR – Program delivery agent
MEAS: The measure the customer received, per the program tracking data
QTY: Quantity listed in the program tracking data
V_QTY: Quantity verified by the customer
INS_QTY: Quantity of measures installed by the customer (basic measures only). If for extended and weatherization measures, V_QTY = INS_QTY.

Introduction

Hello, my name is __________ from Opinion Dynamics, an independent research company, and I’m calling on behalf of the Ontario Power Authority. 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 someone in your household who is the most familiar with the free upgrades that 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
   98. (Don’t know)
   99. (Refused)

   [ASK IF C1 = 2, 98, 99; 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 representatives from [LDC/CONTRACTOR] assessed your
home’s energy use, provided you with information about ways to save energy, and provided certain energy saving products for use in your home. Is that correct?
1. (Yes)
2. (No)
3. (Social housing provider)
98. (Don’t know)
99. (Refused)

[Thank and Terminate if CV1 = 99]
[Thank and Terminate if CV1 = 3: We’ll be giving you a call back at another time.]

[ASK IF CV1 = 2 OR CV1 = 98]
CV2. Is it possible that someone else handled your home’s participation in the Home Assistance Program? [IF YES, RECORD NAME/PHONE, SCHEDULE CALLBACK]
0. (OPEN END)
98. (Don’t know)
99. (Refused)

[Thank and Terminate if CV2 = 98 OR CV2 = 99]

Program Participation

First, I would like to ask you about your participation in the program.
P1. How did you learn about the Home Assistance Program? [MULTIPLE RESPONSE; UP TO 3]
   1. (Bill insert)
   2. (Letter from [LDC])
   3. ([LDC] website)
   4. (Call from a program staff)
   5. (Visit from program staff)
   6. (Community event or seminar)
   7. ([LDC] contact)
   8. (Landlord/building superintendent/building manager)
   0. (Other, specify)
98. (Don’t know)
99. (Refused)

P2. How did you sign up for the in-home energy audit?
   1. (I filled out an application)
   2. (I called [LDC])
   3. (Signed up at an event or presentation)
   4. (I did not sign up, my landlord/building manager/building superintendent did)
   8. (Other - specify)
98. (Don’t know)
99. (Refused)
E1a. During the [IF SITE_VISIT > 1, “first“ ] energy audit, did the program representative install items such as CFLs and low flow showerheads, or did they leave them behind for you to install on your own?  
1. (Auditor installed all measures)  
2. (Auditor left all measures behind)  
3. (Auditor installed some measures, and left others behind)  
8. (Don’t know)  
9. (Refused)

Education

E1. On a scale from 1 to 7, where 1 is “not at all knowledgeable” and 7 is “very knowledgeable,” how would you rate your knowledge of things you can do to reduce your home’s energy use BEFORE you participated in the program? [1-7, 98=DON’T KNOW, 99=REFUSED]

E2. While they were conducting the audit, did the program representative discuss energy efficiency, and ways to save energy in your home?  
1. (Yes)  
2. (No)  
8. (Don’t know)  
9. (Refused)

E4. Did the program representative leave behind any written materials providing recommendations on ways to save energy? [PROBE FOR EDUCATIONAL MATERIALS RECEIVED. INSTRUCTIONS FOR EQUIPMENT SHOULD BE CODED AS “NO.”]  
1. (Yes)  
2. (No)  
8. (Don’t know)  
9. (Refused)

[ASK IF E4=1]

E5. Did the program representative discuss the recommendations provided in the written materials with you?  
1. (Yes)  
2. (No)  
8. (Don’t know)  
9. (Refused)

[ASK IF E2=1]

E6. On a scale from 1 to 7, where 1 is “not at all useful” and 7 is “very useful,” in general, how useful was the information that you learned from the representative? [1-7, 98=DON’T KNOW, 99=REFUSED]

E7. What other ways can you think of for [LDC] to provide you with useful information to help you save energy? [MULTIPLE RESPONSE, UP TO THREE]  
1. (Provide web resources)  
2. (Hold seminars)
3. (Send information in my monthly bill)
0. (Other, specify)
8. (Don’t know)
9. (Refused)

Measure Verification

Now we would like to ask you some questions about the free energy efficiency upgrades that the program representative installed in your home.

[Loop for each QTY, MEAS - CFL, Block Heater Timer, Power Bar, Hot Water Tank Insulation, Hot Water Tank Pipe Insulation, Showerhead, Aerator, Refrigerator, Freezer, Window AC, Dehumidifier, Programmable Thermostat, Draft Proofing, Insulation]

[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.]
[POWER BAR DESCRIPTION: The Home Assistance Program offered 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.]

MEASURE 1

[If QTY1 = 0, read as blank]

V1_1. [IF CFLs, READ CFL DESCRIPTION; IF POWER BAR, READ POWER BAR DESCRIPTION] Our records show that you received [QTY1] [MEAS1] through the program. Is that correct?
  1. (Yes - All)
  2. (No - None)
  3. (Different number)
  7. (Wouldn’t know, not able to install that measure)
  8. (Don’t know)
  9. (Refused)

[GO TO NEXT SECTION IF V1_1=2,8,9]
[ASK IF V1_1 = 3]

V1a_1. How many [MEAS1] did you receive through the program? [NUMERIC OPEN END, 1-90]
  0. (None)
  98. (Don’t know)
  99. (Refused)

[GO TO NEXT SECTION IF V1A_1=0,98,99]

GEN V_QTY1.
V_QTY1 = QTY1 IF V1_1 = 1
V_QTY1 = V1a_1 IF V1_1 = 3
[ASK IF V1_1 = 1 OR 3]
[ASK FOR MEAS = CFL, POWER BAR, SHOWERHEAD, AERATOR]
[If V_QTY1 = 0, READ AS BLANK]

[ASK IF E1a = 2, 3; ELSE SKIP TO V3_1]

V2_1. Did you install the [V_QTY1] [MEAS] you received through the program?
   1. (Yes - All)
   2. (No - None)
   3. (Some)
   8. (Don’t know)
   9. (Refused)

[ASK IF V2_1 = 2]
V2a_1. Why didn’t you install the [MEAS]? [OPEN END]

[ASK IF V2_1=3]
V2b_1. How many of the [V_QTY1] [MEAS] did you install? [NUMERIC OPEN END, 1-90]
   o. (None)
   98. (Don’t know)
   99. (Refused)

[ASK IF E1A=3 and V2_1 != 1]
QV2C_1. How many of the <V_QTY1> <MEAS> did the auditor install? [NUMERIC OPEN END, 1-90]
   o. (None)
   98. (Don’t know)
   99. (Refused)

GEN INS_QTY1.
INS_QTY1 = V_QTY1 IF V2_1 WAS SKIPPED
INS_QTY1 = V_QTY1 IF V2_1 = 1
INS_QTY1 = V2b_1 + V2C_1 if E1A=2,3
[SKIP IF INS_QTY1 = 0 & MEAS <> INSULATION, DRAFT PROOFING, PIPEWRAP & (V2_1 = 2 OR V2b_1 = 0)]

V3_1. [IF INS_QTY1<=1, IS, IF INS_QTY1>1, ARE] the [INS_QTY1] [MEAS] you received through the program still installed?
   1. (Yes - All)
   2. (No - None)
   3. (Some)
   8. (Don’t know)
   9. (Refused)

[ASK IF V3_1 = 3]
V4_1. How many of the [MEAS] are still installed? [NUMERIC 0-50, 98=DON’T KNOW, 99=REFUSED]

[ASK IF V3_1 = 2 OR V3_1 = 3]
V5_1. Why did you remove the [MEAS1]?

V6_1. 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 [MEAS1] you received? [1-7, 8=DON'T KNOW, 9=REFUSED]

[ASK IF V6_1 <6]
V7_1. Why did you give this rating?
   0. [OPEN END]
   8. (Don’t know)
   9. (Refused)

MEASURE 2

[If QTY2 = 0, READ AS BLANK]
V1_2. [IF CFLs, READ CFL DESCRIPTION; IF POWER BAR, READ POWER BAR DESCRIPTION] Our records show that you received [QTY2] [MEAS2] through the program. Is that correct?
   1. (Yes - All)
   2. (No - None)
   3. (Different number)
   7. ( Wouldn’t know, not able to install that measure)
   8. (Don’t know)
   9. (Refused)

[GO TO NEXT SECTION IF V1_2=2,8,9]
[ASK IF V1_2 = 3]
V1a_2. How many [MEAS2] did you receive through the program? [NUMERIC OPEN END, 1-90]
   0. (None)
   8. (Don’t know)
   9. (Refused)

[GO TO NEXT SECTION IF V1A_2=0,98,99]

GEN V_QTY2.
V_QTY2 = QTY2 IF V1_2 = 1
V_QTY2 = V1a IF V1_2 = 3

[ASK IF V1_2 = 1 OR 3]
[ASK FOR MEAS = CFL, POWER BAR, SHOWERHEAD, AERATOR]
[IF V_QTY2= 0, READ AS BLANK]
[ASK IF E1a =2, 3; ELSE SKIP TO V3_2]
V2_2. Did you install the [V_QTY2] [MEAS2] you received through the program?
   1. (Yes - All)
   2. (No - None)
   3. (Some)
   8. (Don’t know)
   9. (Refused)
[ASK IF V2_2 = 2]
V2a_2. Why didn’t you install the [MEAS2]? [OPEN END]

[ASK IF V2=3]
V2b_2. How many of the [V_QTY2] [MEAS2] did you install? [NUMERIC OPEN END, 1-90]

0. (None)
8. (Don’t know)
9. (Refused)

GEN INS_QTY2.
INS_QTY = V_QTY1 IF V2_2 WAS SKIPPED
INS_QTY2= V_QTY2 IF V2_2 = 1
INS_QTY2 = V2b_2 if V2 = 3

[SKIP IF INS_QTY2 = 0 & MEAS <> INSULATION, DRAFT PROOFING, PIPEWRAP & (V2_2 = 2 OR V2b_2 = 0)]
V3_2. [IF INS_QTY2<=1, IS, IF INS_QTY121, ARE] the [INS_QTY2] [MEAS2] you received through the program still installed?
1. (Yes - All)
2. (No - None)
3. (Some)
8. (Don’t know)
9. (Refused)

[ASK IF V3_2 = 3]

[ASK IF V3_2 = 2 OR V3_2 = 3]]
V5_2. Why did you remove the [MEAS2]?

V6_2. 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 [MEAS2] you received? [1-7, 8=DON’T KNOW, 9=REFUSED]

[ASK IF V6_2<6]
V7_2. Why did you give this rating?
0. (OPEN END)
8. (Don’t know)
9. (Refused)

MEASURE 3

[IF QTY3 = 0, READ AS BLANK]
V1_3. [IF CFLs, READ CFL DESCRIPTION; IF POWER BAR, READ POWER BAR DESCRIPTION] Our records show that you received [QTY3] [MEAS3] through the program. Is that correct?
1. (Yes – All)
2. (No – None)
3. (Different number)
7. (Wouldn't know, not able to install that measure)
8. (Don't know)
9. (Refused)

[GO TO NEXT SECTION IF V1_3=2,8,9]

[ASK IF V1_3 = 3]
V1a. How many [MEAS3] did you receive through the program? [NUMERIC OPEN END, 1-90]
   0. (None)
   8. (Don't know)
   9. (Refused)

[GO TO NEXT SECTION IF V1A_3=0,98,99]

GEN V_QTY3.
V_QTY3 = QTY3 IF V1_3 = 1
V_QTY3 = V1a_3 IF V1_3 = 3

[ASK IF V1_3 = 1 OR 3]
[ASK FOR MEAS = CFL, POWER BAR, SHOWERHEAD, AERATOR]
[IF V_QTY3= 0, READ AS BLANK]
[ASK IF E1a =2, 3; ELSE SKIP TO V3_3]
V2. Did you install the [V_QTY3] [MEAS3] you received through the program?
   1. (Yes - All)
   2. (No - None)
   3. (Some)
   8. (Don't know)
   9. (Refused)

[ASK IF V2_3 = 2]
V2a. Why didn't you install the [MEAS3]? [OPEN END]

[ASK IF V2_3=3]
V2b. How many of the [V_QTY3] [MEAS3] did you install? [NUMERIC OPEN END, 1-90]
   0. (None)
   8. (Don't know)
   9. (Refused)
V2c. How many of the <V_QTY3> <MEAS3>(s) did the auditor install? [NUMERIC OPEN END]
   0. (None)
   8. (Don't know)
   9. (Refused)

GEN INS_QTY3.
INS_QTY = V_QTY1 IF V2_3 WAS SKIPPED]
INS_QTY3 = V_QTY3 IF V2_3 = 1
INS_QTY3 = V2b_3 if V2_3 = 3

[SKIP IF INS_QTY3 = 0 & MEAS <> INSULATION, DRAFT PROOFING, PIPEWRAP & (V2_3 = 2 OR V2b_3 = 0)]
V3_3. [IF INS_QTY3<=1, IS, IF INS_QTY121, ARE] the [INS_QTY3] [MEAS3] you received through the program still installed?
1. (Yes - All)
2. (No - None)
3. (Some)
8 (Don’t know)
9. (Refused)

[ASK IF V3_3 = 3]

[ASK IF V3_3 = 2 OR V3_3 = 3]
V5_3. Why did you remove the [MEAS3]?

V6_3. 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 [MEAS3] you received? [1-7, 8=DON’T KNOW, 9=REFUSED]

[ASK IF V6_3<6]
V7_3. Why did you give this rating?
0. (OPEN END)
98. (Don’t know)
99. (Refused)

Free Ridership

CFLs

[CALCULATE CFL_QTY = INS_QTY1 if MEAS1 = CFL, CFL_QTY = INS_QTY2 if MEAS2 = CFL, CFL_QTY = INS_QTY3 if MEAS3 = CFL ]
[ASK IF CFL_QTY > 0]

I have a few more questions about the lighting in your home.

CFLFR1. Before the home energy audit, did you have any CFLs installed in your home?
1. (Yes)
2. (No)
98. (Don’t know)
99. (Refused)

[ASK CFLFR1a IF CFLFR1=1, ELSE SKIP TO CFLFR2]
CFLFR1a. Thinking about ALL of the light sockets in your home in which you could use a CFL, how many of them contained CFLs BEFORE you received the CFLs from [LDC]; would you say most of them, some of them, a few of them, or none of them?
1. (Most of them)
2. (Some of them)
3. (A few of them)
4. (None of them)
8. (Don’t know)
9. (Refused)

CFLFR2. I am interested in the types of bulbs that the [CFL_QTY] FREE CFLs you received through the program replaced. How many of the [CFL_QTY] CFLs replaced...

a. Traditional Incandescent bulbs [IF NEEDED: INCANDESCENT BULBS ARE TRADITIONAL LIGHTBULBS.] [NUMERIC RESPONSE]
b. other CFLs [NUMERIC RESPONSE] [IF NEEDED: 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 IT FITS IN A REGULAR LIGHT BULB SOCKET.]
c. Other types of bulbs [NUMERIC RESPONSE]
d. Were installed in empty sockets [NUMERIC RESPONSE]
e. Were put in storage [Number Response]

[ASK IF CFLFR2B>0]

CFLFR3. I want to make sure I recorded your response to the previous question correctly. [READ IF CFL DESCRIPTION WASN’T PREVIOUSLY READ: CFLs are “twisty” bulbs that are made with a glass tube bent into a spiral, resembling soft-serve ice-cream. Very often they look just like the bulbs that were installed through the program.] Could you please confirm that [CFLFR2B RESPONSE] of the program CFLs that you installed replaced other CFLs, and not incandescent or other types of bulbs?
1. (Yes)
2. (No) [GO BACK TO CFLFR2B AND ADJUST RESPONSES]
8. (Don’t know)
9. (Refused)

[ASK IF CFLFR2A>0, ELSE SKIP TO SHOFR1]
CFLFR4. [READ IF CFLFR2A=1] Was the incandescent light bulb burnt out when you replaced it with CFL or was it working?  
[ELSE READ] Were any of your incandescent light bulbs burnt out when you replaced them with the CFLs or were they all working at the time?  
1. (All burnt out)  
2. (All working)  
3. (Some were working and some were burnt out)  
8. (Don’t know)  
9. (Refused)  

CFLFR5. [READ IF CFL_QTY=1] If you had not received the free CFL from [LDC], would you have replaced this incandescent light bulb with a CFL or would you have replaced it with another incandescent light bulb?  
[ELSE READ] If you had not received the free CFLs from [LDC], would you have replaced these incandescent light bulbs with CFLs or would you have replaced them with other incandescent light bulbs?  
1. CFLs  
2. Incandescent  
3. (Some CFLs and some incandescent)  
8. (Don’t know)  
9. (Refused)  

[Skip if CFLFR5=2]  
[Ask if CFLFR4=2 or 3]  

CFLFR6. [READ IF CFL_QTY=1] If you had not received the CFL from [LDC], would you have replaced your WORKING light bulb at about the same time that you did, or would you have waited for it to burn out?  
[ELSE READ] You If you had not received the CFLs from [LDC], would you have replaced your WORKING light bulbs at about the same time that you did, or would you have waited for them to burn out?  
1. At the same time  
2. At burnout  
3. (some at same time, some at burnout)  
8. (Don’t know)  
9. (Refused)  

Showerhead  
[Calculate SH_QTY=INS_QTY1 if MEAS1 = Showerheads, SH_QTY=INS_QTY2 if MEAS2 = Showerheads, SH_QTY=INS_QTY3 if MEAS3 = Showerheads]  
[Ask if SH_QTY > 0]  

SHOFR1. If you had not received the [SH_QTY] low flow showerheads that the program gave you during the audit, would you have purchased and installed low flow showerheads on your own?  
1. (Yes)  
2. (No)  
8. (Don’t know)  
9. (Refused)
[ASK IF SHOFR1=1 AND IF SH_QTY > 1]
SHOFR2. Would you have purchased and installed the same number of low flow showerheads or would you have purchased fewer?
1. Same number
2. Fewer
3. (Would not have installed low flow showerheads)
8. (Don’t know)
9. (Refused)

[ASK IF SHOFR1=1 & SHOFR2 != 3]
SHOFR3. The average low flow showerhead costs $15. Knowing this, would you still have purchased and installed [SH_QTY] low flow showerhead(s) for $[SH_QTY * 15] if the program had not provided it/them for free?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

Aerator

[CALCULATE FA_QTY=INS_QTY1 IF MEAS1 = Faucet Aerators, FA_QTY=INS_QTY2 IF MEAS2 = Faucet Aerators FA_QTY=INS_QTY3 IF MEAS3 = Faucet Aerators]
[ASK IF FA_QTY > 0]

AEROFR1. If you had not received the [FA_QTY] faucet aerator(s) that the program gave you during the audit, would you have purchased and installed faucet aerators on your own?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

[ASK IF AEROFR1=1 & FA_QTY > 1]
AEROFR2. Would you have purchased and installed [FA_QTY] faucet aerator(s) or would you have purchased fewer of them?
1. Same number
2. Fewer
3. (Would not have installed faucet aerators)
8. (Don’t know)
9. (Refused)

[ASK IF AEROFR1=1, SKIP IF AEROFR2 = 3]
AEROFR3. The average faucet aerator costs $15. Knowing this, would you still have purchased and installed [FA_QTY] faucet aerator(s) for $[FA_QTY * 15] if the program had not provided it/them for free?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

Pipe Wrap

[ASK IF MEAS1 = PIPEWRAP & V1_1=1 OR MEAS2 = PIPEWRAP & V1_2=1 OR MEAS3 = PIPEWRAP & V1_3=1]

PWFR1. If you had not received the pipe wrap that the program gave you during the audit, would you have...
1. Purchased and installed the pipe wrap at the same time
2. Purchased and installed the pipe wrap at a later time
3. Not purchased pipe wrap
8. Don’t know
9. Refused

[ASK if PWFR1=2]

PWFR2. When would you have purchased it on your own? Would you say...
1. Within a few months
2. Within a year
3. More than a year later?
8. (Don’t know)
9. (Refused)

[ASK IF PWFR1=1 OR 2]

PWFR3. The average pipe wrap installation costs $1. Knowing this, would you still have purchased and installed the pipe wrap if the program had not provided it for free?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

Tank Insulation

[ASK IF MEAS1 = TANKWRAP & V1_1=1 OR MEAS2 = TANKWRAP & V1_2=1 OR MEAS3 = TANKWRAP & V1_3=1]

TANKFR1. If you had not received the tank wrap that the program gave you during the audit, would you have...
1. Purchased the tank wrap at the same time
2. Purchased the tank wrap at a later time
3. Not purchased tank wrap
8. Don’t know
9. Refused

[ASK if TANKFR1=2]

TANKFR2. When would you have purchased it on your own?
1. Within a few months
2. Within a year
3. More than a year
8. (Don’t know)
9. (Refused)

[ASK IF TANKFR1=1,2]
TANKFR3. The average tank wrap installation costs $20. Knowing this, would you still have purchased and installed the tank wrap if the program had not provided it for free?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

Appliance

[LOOP FOR EACH MEAS: MEAS1 = FRIDGE/FREEZER/RAC/DEHUM & V1_1=1 OR MEAS2 = FRIDGE/FREEZER/RAC/DEHUM & V1_2=1 OR MEAS3 = FRIDGE/FREEZER/RAC/DEHUM & V1_3=1]

APPFR1. If you had not received the replacement [MEAS] that the program gave you during the audit, would you have...
1. Purchased the replacement [MEAS] at the same time
2. Purchased the replacement [MEAS] at a later time
3. Not purchased the replacement [MEAS]
8. Don’t know
9. Refused

[ASK if APPFR1=2]
APPFR2. When would you have purchased the [MEAS] on your own? Would you say...
1. Within a few months
2. Within a year
3. More than a year later?
8. (Don’t know)
9. (Refused)

[ASK IF APPFR1=1 OR 2]
APPFR3. The average [REFRIGERATOR/FREEZER/Room AC/Dehumidifier] costs $[800/550/245/265]. Knowing this, would you still have purchased and installed the [REFRIGERATOR/FREEZER/Room AC/Dehumidifier] if the program had not provided it/them for free?

Block Heater Timer

[CALCULATE BH_QTY=INS_QTY1 IF MEAS1 = Block Heater Timer, BH_QTY=INS_QTY2 IF MEAS2 = Block Heater Timer BH_QTY=INS_QTY3 IF MEAS3 = Block Heater Timer]
[ASK IF BH_QTY > 0]
BLOCKFR1. If you had not received the [BH_QTY] block heater timer(s) that the program gave you during the audit, would you still have purchased [BH_QTY] of them?
1. (Yes)
2. (No)
3. (Would have purchased fewer)
8. (Don’t know)
9. (Refused)

[ASK IF BLOCKFR1 = 1]

BLOCKFR2. Would you have purchased the [BH_QTY] block heater timer(s) at the same time as when you received it/them, or would you have purchased them later.
1. (At the same time)
2. (Later)
8. (Don’t Know)
9. (Refused)

[ASK if BLOCKFR2 = 2]

BLOCKFR2A. When would you have purchased it/them on your own? Would you say...
1. Within a few months
2. Within a year
3. More than a year later
8. (Don’t know)
9. (Refused)

[ASK IF BLOCKFR1=1 ]

BLOCKFR3. The average block heater timer costs $22. Knowing this, would you still have purchased and installed [BH_QTY] block heater timer(s) for $[BH_QTY * 22] if the program had not provided it/them for free?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

Power Bar

[CALCULATE PB_QTY=INS_QTY1 IF MEAS1 = Power Bar, PB_QTY=INS_QTY2 IF MEAS2 = Power Bar PB_QTY=INS_QTY3 IF MEAS3 = Power Bar]

[ASK IF PB_QTY > 0]

POWERFR1. If you had not received the [PB_QTY] power bar(s) with integrated timer(s) that the program gave you during the audit, would you have...
1. Purchased [PB_QTY] power bar(s) with integrated timer(s) at the same time
2. Purchased [PB_QTY] bar timer(s) with integrated timer(s) at a later time
3. Not purchased any power bar(s) with integrated timer(s).
8. (Don’t know)
9. (Refused)
[ASK IF POWERFR1 = 1 OR 2 AND PB_QTY > 1]

POWERFR2. Would you have bought the same number, or fewer?

1. Same
2. Fewer
8. (Don’t know)
9. (Refused)

[ASK if POWERFR1=2]

POWERFR3. When would you have purchased the power bar(s) with integrated timer(s) on your own? Would you say...

1. Within a few months
2. Within a year
3. More than a year later
8. (Don’t know)
9. (Refused)

[ASK IF POWERFR1 = 1 OR 2]

POWERFR4. The average power bar with integrated timer costs $45. Knowing this, would you still have purchased and installed [PB_QTY] power bar with integrated timer(s) for $[PB_QTY * 45] if the program had not given it/them for free?

1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

Programmable Thermostat

[ASK IF MEAS1 = THERMOSTAT & V1_1=1 OR MEAS2 = THERMOSTAT & V1_2=1 OR MEAS3 = THERMOSTAT & V1_3=1]]

PTFR1. Have you programmed the thermostat installed through the program?

1. (Yes)
2. (No)
98. (Don’t know)
99. (Refused)

PTFR2. If you had not received the programmable thermostat that the program gave you during the audit, would you have...

1. Purchased the programmable thermostat at the same time
2. Purchased the programmable thermostat at a later time
3. Not purchased the programmable thermostat
8. Don’t know
9. Refused

[ASK IF PTFR2=2]
PTFR3. When would you have purchased it on your own?
1. Within a few months
2. Within a year
3. More than a year
4. (Don’t know)
5. (Refused)

[ASK IF PTFR2=1 OR 2]

PTFR4. The average programmable thermostat costs $85. Knowing this, would you still have purchased and installed the programmable thermostat if the program had not provided it for free?
1. (Yes)
2. (No)
3. (Don’t know)
4. (Refused)

Draft Proofing
[ASK IF MEAS1 = DRAFTPROOFING & V1_1=1 OR MEAS2 = DRAFTPROOFING & V1_2=1 OR MEAS3 = DRAFTPROOFING & V1_3=1]

DPFR1a. Before you learned about the Home Assistance Program, had you looked into getting a home energy audit, other than the one provided by the program?
1. (Yes)
2. (No)
3. (Don’t know)
4. (Refused)

[ASK IF DPFR1a=1]

DPFR1b. If the auditor had recommended draft proofing, would you have hired a contractor to draft proof your home?
1. (Yes)
2. (No)
3. (Don’t know)
4. (Refused)

[ASK IF DPFR1b = 2, 98, 99]

DPFR2a. If you had not had your home draft proofed by the program, would you have...
1. Draft proofed your home at about the same time as was done by the program
2. Draft proofed your home at a later time
3. Not draft proofed your home
4. (Don’t know)
5. (Refused)

[ASK if DPFR2a=2]

DPFR2b. When would you have draft proofed your home on your own?
1. Within a few months
2. Within a year
3. More than a year
8. (Don’t know)
9. (Refused)

[ASK if DPFR2a 1 OR2]

DPFR3. The average draft proofing project costs $300. Knowing this, would you still have had your home draft proofed for $300 if the program had not given provided it for free?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)

Insulation

[ASK IF MEAS1 = INSULATION & V1_1=1 OR MEAS2 = INSULATION & V1_2=1 OR MEAS3 = INSULATION & V1_3=1]

[ASK IF DPFR1 = MISSING]

INSFR1. Before you learned about the Home Assistance Program, had you looked in to getting a home energy audit, other than the one provided by the program?
1. (Yes)
2. (No)
98. (Don’t know)
99. (Refused)

INSFR2. If you had not had your home insulated by the Home Assistance Program, would you have...
1. Installed extra insulation in your home at about the same time as it was done by the program
2. installed extra insulation in your home at a later time
3. Not installed extra insulation your home
8. (Don’t know)
9. (Refused)

[ASK if INSFR2=2]

INSFR2a. When would you have insulated your home on your own?
1. Within a few months
2. Within a year
3. More than a year
8. (Don’t know)
9. (Refused)

[ASK if INSFR2=1 OR 2]

INSFR3. The average additional insulation project costs $1250. Knowing this, would you still have had additional insulation installed in your home for $1250 if the program had not given provided it for free?
1. (Yes)
2. (No)
8. (Don’t know)
9. (Refused)
Spillover

SP1. Now I have a few questions about the energy saving improvements you might have made for which you did not receive incentives from the Home Assistance Program. Since your participation in the program, have you: [1=Yes; 2=No; 98=Don’t Know; 99=Refused]

a. Purchased and installed an ENERGY STAR appliance?
b. Purchased a new ENERGY STAR room air conditioner?
c. Installed additional CFLs?
d. Installed LED light bulbs
e. Purchased and installed anything else?

[ASK IF SP1a=1]
SP1AA. What kind of ENERGY STAR appliance did you buy?

[ASK IF SP1c = 1]
SP1CC. How many additional CFLs did you install? [NUMERIC RESPONSE 1-50, 98=Don’t Know; 99=Refused]

[ASK IF SP1d = 1]
SP1DD. How many additional LEDs did you install? [NUMERIC RESPONSE 1-50, 98=Don’t Know; 99=Refused]

[ASK IF SP1A = 1]
SP2A. Did the Home Assistance Program influence you in any way to purchase this appliance?

1. (Yes)
2. (No)
98. (Don’t Know)
99. (Refused)

[ASK IF SP2A=1]
SP3A. On a scale that ranges from 1 to 7 where 1 is “not at all influential” and 7 is “extremely influential”, how influential was your participation in the Home Assistance Program on your decision to purchase and install the ENERGY STAR appliance? [RECORD 1-7; 98=Don’t Know; 99=Refused]

[ASK IF SP3A= 6 or 7]
SP4A. More specifically, how did the Home Assistance Program influence your decision to purchase the ENERGY STAR Appliance? [OPEN END; 98=Don’t Know; 99=Refused]

[ASK IF SP1B = 1]SP2B. Did the Home Assistance Program influence you in any way to purchase the ENERGY STAR room air conditioner?

1. (Yes)
2. (No)
98. (Don’t Know)
99. (Refused)

[ASK IF SP2B=1]
SP3B. On a scale that ranges from 1 to 7 where 1 is “not at all influential” and 7 is “extremely influential”, how influential was your participation in the Home Assistance Program on your decision to purchase the ENERGY STAR room air conditioner? [RECORD 1-7; 98=Don’t Know; 99=Refused]

[ASK IF SP3B= 6 or 7]

SP4B. More specifically, how did the Home Assistance Program influence your decision to purchase the ENERGY STAR room air conditioner? [OPEN END; 98=Don’t Know; 99=Refused]

[ASK IF SP1C = 1]

SP2C. Did the Home Assistance Program influence you in any way to install the additional CFLs?
1. (Yes)
2. (No)
98. (Don’t Know)
99. (Refused)

[ASK IF SP2C=1]

SP3C. On a scale that ranges from 1 to 7 where 1 is “not at all influential” and 7 is “extremely influential”, how influential was your participation in the Home Assistance Program on your decision to install the additional CFLs? [RECORD 1-7; 98=Don’t Know; 99=Refused]

[ASK IF SP3C= 6 or 7]

SP4C. More specifically, how did the Home Assistance Program influence your decision to install the additional CFLs? [OPEN END; 98=Don’t Know; 99=Refused]

[ASK IF SP1D = 1]

SP2D. Did the Home Assistance Program influence you in any way to install the LED light bulbs?
1. (Yes)
2. (No)
98. (Don’t Know)
99. (Refused)

[ASK IF SP2D=1]

SP3D. On a scale that ranges from 1 to 7 where 1 is “not at all influential” and 7 is “extremely influential”, how influential was your participation in the Home Assistance Program on your decision to install the LED light bulbs? [RECORD 1-7; 98=Don’t Know; 99=Refused]

[ASK IF SP3D= 6 or 7]

SP4D. More specifically, how did the Home Assistance Program influence your decision to install the LEDs? [OPEN END; 98=Don’t Know; 99=Refused]

[ASK IF SP1E=1]

SP2E. What other energy saving improvements did you make? [OPEN END]

[ASK IF SP1E=1]
SP3E. On a scale that ranges from 1 to 7 where 1 is “not at all influential” and 7 is “extremely influential”, how influential was your participation in the Home Assistance Program on your decision to install the other energy saving improvement(s)? [RECORD 1-7; 98=Don’t Know; 99=Refused]

[ASK IF SP3E= 6 or 7]
SP4E. More specifically, how did the Home Assistance Program influence your decision to install the other energy saving improvement(s)? [OPEN END; 98=Don’t Know; 99=Refused]

Other Energy Saving Efforts

SA1. Outside the Home Assistance Program, have you received any other free upgrades or free CFLs in the past year?
   1. (Yes)
   2. (No)
   8 (Don’t know)
   9. (Refused)

[ASK if SA1 = 1]
SA2. Can you tell me the name of the program or the group offering the free upgrades or CFLs?
   oo. [OPEN END]
   98. (Don’t know)
   99. (Refused)

Behavior Change

BC1. I’m going to read you a list of actions you might have taken to save more energy in your home. For each, please tell me if you have taken that action. Have you...
   [1=Yes, 2=No, 98=Don’t know, 99=Refused]
   a. Lowered your hot water use, including taking shorter showers or washing clothes in cold water?
   b. NONE
   c. Turned off lights more frequently since you’ve participated in the program?
   d. Unplug unused appliances?
   e. Turned off heated dry setting on dishwashers [3=No dishwasher]
   f. [ASK IF PB_QTY > 0] Setting the timer on your power bar
   g. [ASK IF E2 = 1] Take action on any other recommendations that the program representative might have mentioned?

[ASK IF BC1g=1]
BC2. What other recommendations did you take action on? [OPEN END]
   oo. (OPEN END)
   98. (Don’t know)
   99. (Refused)

[ASK IF BC1A-G ALL = 2]
BC3. Why have you not taken any additional actions to save energy in your home? [MULTIPLE RESPONSE,
UP TO 5]
1. (Still planning on taking action, - something causing delay)
2. (The cost was too high)
3. (Have not had time/too busy)
4. (Waiting for someone else to take action (e.g., homeowner, family, etc.)
00. (Other (specify: _____________________________________))
98. (Don’t know)
99. (Refused)

BC4. Have you shared what you learned during your participation in the Home Assistance Program, or any of the educational materials you received, with a family member, friend or neighbor?
1. (Yes)
2. (No)
98. (Don’t know)
99. (Refused)

Non-Energy Benefits

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. Does someone in your household pay the electric bill?
1. Yes
2. No
8. (Don’t know)
9. (Refused)

[ASK IF NE2 = 2]
NE2a. Who pays the electric bill? [OPEN END, RECORD RESPONSE]

[ASK IF NE2 = 1]
NE2b. Which of the following sentences best describes how your ELECTRIC bill has changed because of the free upgrades installed during your home energy audit? (NOTE TO INTERVIEWER: WE’RE ONLY INTERESTED IN ELECTRIC BILL, NOT GAS OR OTHER TYPES OF ENERGY)
1. My electric bill has stayed the same
2. My electric bill has gone down
3. My electric bill has gone up
8. (Don’t know)
9. (Refused)
NE3. Besides the benefits we mentioned, what other benefits have you experienced because of your participation in the program? [MULTIPLE RESPONSE, OPEN END]
   1. (lighting – like the light level better)
   2. (environmentalism– improved sense of environmental responsibility)
   3. (health improved)
   4. (miss less work)
   5. (home is less drafty)
   6. (noise reduction)
   7. (decreased maintenance costs)
   8. (other, open end, specify VERBATIM)
   96. (no, none)
   98. (DON’T KNOW)
   99. (REFUSED)

[ASK IF NE3 <> 96, 98, 99 OR NE1=1 OR NE2b=2]

NE4. If you had to pay for these other benefits, how much would you be willing to pay? [NUMERIC OPEN END, 1-1000]

[ASK IF NE3 <> 96, 98, 99 OR NE1=1 OR NE2b=2]

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

Demographics

We’re almost finished. I just have a few questions about your household to make sure we’re talking with a representative sample of customers.

D1. Do you or someone in your household own this home or do you rent?
   1. Own
   2. Rent
   3. (Other – Specify)
   98. (Don’t know)
   99. (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)
1. (Before 1950)
2. (Between 1950 and 1959)
3. (Between 1960 and 1969)
4. (Between 1970 and 1978)
5. (Between 1979 and 1988)
6. (Between 1989 and 2001)
7. (Between 2002 and 2007)
8. (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]
01. (Natural gas)
02. (Bottled, tank or LP gas)
03. (Electric)
04. (Oil, kerosene)
05. (Coal (coke))
06. (Wood)
07. (Solar)
08. (Other, specify)
96. (No fuel)
98. (Don’t know)
99. (Refused)

D6. Including yourself, how many people currently live in your home year-round?
__________________ [RECORD NUMBER OF PEOPLE]
98. (Don’t know)
99. (Refused)

D7. How many people who currently live in your household are 18 years old or younger?
__________________ [RECORD NUMBER OF PEOPLE]
98. (Don’t know)
99. (Refused)

D9. What is the highest level of education or year of school that you have completed?
1. No schooling (DO NOT READ)
2. Less than high school
3. Some high school
4. High school graduate or equivalent (e.g., GED)
5. Some college, no degree
6. College degree
7. Graduate or professional degree
D10. 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
6. (Other, Specify)
7. (Don’t Know)
8. (Refused)
Appendix F.  Free Ridership Logic

Figure 3: Screw-In CFL Free Ridership

(CFL FR = $Q' ET$)

CFLR2: What type of bulbs did those received through the program replace, and how many?

A) Incandescent  B) CFL  C) Other  D) empty sockets  E) storage  F) Don’t Know  G) Refused

CFLR3: To confirm the previous question, were CFLs replaced by CFLs from the program?

1) Yes (FRa=1)  2) No, Don’t know, Refused (adjust previous response)

CFLR4: Where the incandescents burnt out when you replaced them?

1) Burnout  2) Working  3) Some of each  4) Don’t know, Refused

CFLR5: If you had not received the free CFL(s), would you have replaced your incandescent bulbs with CFLs?

1) All CFLs (FRb=1)  2) Incandescent (FRb=0)  3) Some CFLs (FRb=0.5)  4) Don’t know, Refused

CFLR6: If you had not received the free CFL(s), would you have replaced your working bulbs at the same time or waited?

1) Same time (FRc=1)  2) At burnout (FRc=0)  3) Some of each (FRc=0.5)  4) Don’t know, Refused (FRc=0)

Figure 4: Pipe Wrap, Tank Insulation, Room A/C, Dehumidifier, and Appliance Free Ridership

(PW FR = FRa * FRb * FRc)

PWFR1/ TANKFR1/ APPFR1: If you had not received [MEAS], would you have purchased at the same time?

Same time FRa=1  Later time  No, Don’t know, Refused

PWFR2/ TANKFR2/ APPFR2: When would you have purchased?

Few months FRb=1  Within year FRb=0.5  More than year, Don’t know, Refused (FRb=0)

PWFR3/ TANKFR3/ APPFR3: The average [MEAS] costs $$, knowing that would you still have purchased and installed?

YES (1) FRc=1  No, Don’t know, Refused (FRc=0)
Figure 5: Block Heater Timer, Draft Proofing, and Insulation Free Ridership

If you had not received the measure through the program, would you have purchased it on your own?
- Yes FR_a = 1
- Fewer
- No, Don't Know, Refused

Would you have purchased it at the same time or later?
- Same time FR_b = 1
- Later
- Don't know, Refused

How much later would you have purchased it?
- Few months FR_c = 1
- Within year FR_c = 0.5
- More than year, Don't know, Refused

Knowing the average cost of the measure, would you still have purchased and installed it?
- YES FR_c = 1
- No, Don't know, Refused

Figure 6: Showerhead and Faucet Aerator Free Ridership

SHOFR1 / AEROFR1: If you had not received the [QTY] from the program, would you have purchased and installed it?
- YES
- NO, Don't know, Refused

SHOFR2 / AEROFR2: Would you have purchased and installed the same number?
- Same FR_a = 1
- Fewer FR_a = 0.5
- Don't know, Refused
- None

SHOFR3 / AEROFR3: The average [MEAS] costs $\$, knowing that would you still have purchased and installed?
- YES FR_b = 1
- No, Don't know, Refused
Figure 7: Programmable Thermostat Free Ridership

\[ FR = FR_a \times FR_b \times FR_c \times FR_d \]

PTFR1: Have you programmed the thermostat you received through the program?

- Yes \( FR_a = 1 \)
- No, Don't Know, Refused

If you had not received the measure through the program, would you have purchased it on your own?

- Yes \( FR_b = 1 \)
- Fewer
- No, Don't Know, Refused

Would you have purchased it at the same time or later?

- Same time \( FR_c = 1 \)
- Later
- Don't know, Refused

How much later would you have purchased it?

- Few months \( FR_c = 1 \)
- Within year \( FR_c = 0.5 \)
- More than year, Don't know, Refused

Knowing the average cost of the measure, would you still have purchased and installed it?

- YES \( FR_d = 1 \)
- No, Don't know, Refused

\( (FR = 0) \)
Figure 8: Power Bar Free Ridership

(\(FR = FR_a \times FR_b \times FR_c\))

If you had not received the \([QTY]\) power bar(s) with integrated timer(s), would you have purchased one with...

- An integrated timer at the same time
- An integrated timer at a later time
- No power bars with no integrated timers, Don't Know, Refused

Would you have purchased the same number of fewer?

- Same \(FR_a=1\)
- Fewer
- Don't know, Refused

When would you have purchased the power bar(s) on your own?

- Few months \(FR_b=1\)
- Within year \(FR_b=.5\)
- More than year, Don't know, Refused

Knowing the average cost of the measure, would you still have purchased and installed it?

- YES \(FR_c=1\)
- No, Don't know, Refused
Appendix G.  Savings Assumptions

The following tables show the results of our review of program savings assumptions for both energy and demand savings.

Energy Savings

Table 12 below shows the changes recommended in our previous report in energy savings for five measures. The table includes the current kWh and the recommended kWh for the measure, as well as the reason for the recommended change.

Table 12. Recommended Changes in Deemed kWh Values

<table>
<thead>
<tr>
<th>Measure</th>
<th>OPA Ex Ante kWh</th>
<th>ODC Recommended kWh</th>
<th>Reason for Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY STAR Qualified CFL Tri-Light (60-75-100W)</td>
<td>89</td>
<td>94</td>
<td>Recalculated using waste heat factors, and used average savings for all three wattages (60W, 75W, 100W)</td>
</tr>
<tr>
<td>Efficient Aerators (Kitchen) &lt; 5.7 Lpm</td>
<td>176</td>
<td>140</td>
<td>Reduced energy needed to heat water based on temperature increase of 15.7 degrees C from 44 degrees C in the OPA measures assumptions (assumes a mixed water temperature of 26.7 and an inlet water temperature of 11)</td>
</tr>
<tr>
<td>Efficient Aerators (Bathroom) &lt; 3.8 Lpm</td>
<td>291</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Dehumidifier Replacement (ENERGY STAR 21.3 - 25.4 l/day)</td>
<td>485</td>
<td>664</td>
<td>Increased efficiency of efficient dehumidifier using ENERGY STAR 2008 minimum standards</td>
</tr>
<tr>
<td>Dehumidifier Replacement (ENERGY STAR 25.5 - 35.5 l/day)</td>
<td>552</td>
<td>934</td>
<td>Increased efficiency of efficient dehumidifier using ENERGY STAR 2008 minimum standards</td>
</tr>
</tbody>
</table>

Demand Savings

The specific end-use profiles used for each measure, peak period definitions used, and recommended peak period coincidence factors are presented in Table 13.

Table 13. Specific Peak Period and End-Use Load Profiles by Measure

<table>
<thead>
<tr>
<th>Measure Number</th>
<th>Measure</th>
<th>End Use Profile</th>
<th>Peak Period</th>
<th>Peak Period Definition</th>
<th>Peak Period CF Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ENERGY STAR qualified CFL twister (60w)</td>
<td>Lighting</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0000519463</td>
</tr>
<tr>
<td>2</td>
<td>ENERGY STAR qualified CFL twister (75w)</td>
<td>Lighting</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0000519463</td>
</tr>
<tr>
<td>3</td>
<td>ENERGY STAR qualified CFL</td>
<td>Lighting</td>
<td>Summer - Non-</td>
<td>Standard</td>
<td>0.0000519463</td>
</tr>
<tr>
<td>Measure Number</td>
<td>Measure</td>
<td>End Use Profile</td>
<td>Peak Period</td>
<td>Peak Period Definition</td>
<td>Peak Period CF Value</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------</td>
<td>-----------------</td>
<td>------------------------------</td>
<td>------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>4</td>
<td>ENERGY STAR qualified CFL tri-light (60-75-100w)</td>
<td>Lighting</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0000519463</td>
</tr>
<tr>
<td>5</td>
<td>ENERGY STAR qualified CFL-PAR30 (75w outdoor)</td>
<td>Outdoor Lighting</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>ENERGY STAR qualified CFL-PAR38 (100w indoor)</td>
<td>Lighting</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0000519463</td>
</tr>
<tr>
<td>7</td>
<td>ENERGY STAR qualified CFL-PAR38 (100w outdoor)</td>
<td>Outdoor Lighting</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>ENERGY STAR qualified CFL-covered A19 (60w)</td>
<td>Lighting</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0000519463</td>
</tr>
<tr>
<td>9</td>
<td>Block Heater Timer (just timer)</td>
<td>Car Block Heater</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Power Bar with integrated timer</td>
<td>Power Bar</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0000444403</td>
</tr>
<tr>
<td>11</td>
<td>Hot Water Tank Pipe Insulation - 1/2&quot; (Per 3 Feet) - Electric Water Heating Only</td>
<td>Residential Water Heat</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001212666</td>
</tr>
<tr>
<td>12</td>
<td>Hot Water Tank Pipe Insulation - 3/4&quot; (Per 3 Feet) - Electric Water Heating Only</td>
<td>Residential Water Heat</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001212666</td>
</tr>
<tr>
<td>13</td>
<td>Hot Water Tank Insulation - fiberglass R10 - Electric Water Heating Only</td>
<td>Residential Water Heat</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001212666</td>
</tr>
<tr>
<td>14</td>
<td>Low-Flow Showerhead - Electric Water Heating Only</td>
<td>Residential Water Heat</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001212666</td>
</tr>
<tr>
<td>15</td>
<td>Low-Flow Showerhead - Electric Water Heating Only</td>
<td>Residential Water Heat</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001212666</td>
</tr>
<tr>
<td>16</td>
<td>Low-Flow Faucet Aerator (5.7 L/min) - Electric Water Heating Only</td>
<td>Residential Water Heat</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001212666</td>
</tr>
<tr>
<td>17</td>
<td>Low-Flow Faucet Aerator (3.8 L/min) - Electric Water Heating Only</td>
<td>Residential Water Heat</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001212666</td>
</tr>
<tr>
<td>18</td>
<td>Refrigerator replacement (ENERGY STAR qualified 15.5 - 16.9 ft³)</td>
<td>Refrigerator</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001277190</td>
</tr>
<tr>
<td>19</td>
<td>Refrigerator replacement (ENERGY STAR qualified 17.0 - 18.4 ft³)</td>
<td>Refrigerator</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001277190</td>
</tr>
<tr>
<td>20</td>
<td>Refrigerator Replacement (10.0 - 12.5 cu ft)</td>
<td>Refrigerator</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001277190</td>
</tr>
<tr>
<td>21</td>
<td>Freezer replacement (ENERGY STAR qualified 12-</td>
<td>Freezer</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001356416</td>
</tr>
<tr>
<td>Measure Number</td>
<td>Measure</td>
<td>End Use Profile</td>
<td>Peak Period</td>
<td>Peak Period Definition</td>
<td>Peak Period CF Value</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
<td>----------------</td>
<td>-------------</td>
<td>------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>22</td>
<td>Freezer replacement (ENERGY STAR qualified 14.5 - 16.0 ft³)</td>
<td>Freezer</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0001356416</td>
</tr>
<tr>
<td>23</td>
<td>Window air conditioner replacement (ENERGY STAR qualified 6,000 – 7,999 BTU/hr)</td>
<td>AC_Room</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0010707343</td>
</tr>
<tr>
<td>24</td>
<td>Window air conditioner replacement (ENERGY STAR qualified 8,000 – 9,999 BTU/hr)</td>
<td>AC_Room</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0010707343</td>
</tr>
<tr>
<td>25</td>
<td>Window air conditioner replacement (ENERGY STAR qualified 10,000 – 12,000 BTU/hr)</td>
<td>AC_Room</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0010707343</td>
</tr>
<tr>
<td>26</td>
<td>Dehumidifier replacement (ENERGY STAR qualified 14.2 - 21.2 l/day)</td>
<td>Dehumidifier</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0003007831</td>
</tr>
<tr>
<td>27</td>
<td>Dehumidifier replacement (ENERGY STAR qualified 21.3 - 25.4 l/day)</td>
<td>Dehumidifier</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0003007831</td>
</tr>
<tr>
<td>28</td>
<td>Dehumidifier replacement (ENERGY STAR qualified 25.5 - 35.5 l/day)</td>
<td>Dehumidifier</td>
<td>Summer - Non-weather sensitive</td>
<td>Standard</td>
<td>0.0003007831</td>
</tr>
<tr>
<td>29</td>
<td>Programmable Thermostat – Baseboard</td>
<td>Space Heating Room</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0000013550</td>
</tr>
<tr>
<td>30</td>
<td>Programmable Thermostat – Electric Furnace</td>
<td>Blended Furnace</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0003951689</td>
</tr>
<tr>
<td>31</td>
<td>Comprehensive Draftproofing</td>
<td>Blended Furnace</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0003951689</td>
</tr>
<tr>
<td>32</td>
<td>Attic Insulation</td>
<td>Blended Furnace</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0003951689</td>
</tr>
<tr>
<td>33</td>
<td>Wall Insulation</td>
<td>Blended Furnace</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0003951689</td>
</tr>
<tr>
<td>34</td>
<td>Basement Insulation</td>
<td>Blended Furnace</td>
<td>Summer - Weather sensitive</td>
<td>Alternate</td>
<td>0.0003951689</td>
</tr>
</tbody>
</table>

Table 14 below shows the deemed kW values currently used by the OPA and the recommended kW as calculated with the updated coincidence factors.
Table 14: kW Savings by Measure

<table>
<thead>
<tr>
<th>Measure Number</th>
<th>Measure</th>
<th>Deemed kW</th>
<th>Recommended kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ENERGY STAR® qualified CFL twister (60w)</td>
<td>0.0014</td>
<td>0.0024</td>
</tr>
<tr>
<td>2</td>
<td>ENERGY STAR® qualified CFL twister (75w)</td>
<td>0.0017</td>
<td>0.0028</td>
</tr>
<tr>
<td>3</td>
<td>ENERGY STAR® qualified CFL twister (100w)</td>
<td>0.0023</td>
<td>0.0038</td>
</tr>
<tr>
<td>4</td>
<td>ENERGY STAR® qualified CFL tri-light (60-75-100w)</td>
<td>0.0028</td>
<td>0.0049</td>
</tr>
<tr>
<td>5</td>
<td>ENERGY STAR® qualified CFL-PAR30 (75w outdoor)</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>6</td>
<td>ENERGY STAR® qualified CFL-PAR38 (100w indoor)</td>
<td>0.0031</td>
<td>0.0052</td>
</tr>
<tr>
<td>7</td>
<td>ENERGY STAR® qualified CFL-PAR38 (100w outdoor)</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>8</td>
<td>ENERGY STAR® qualified CFL-covered A19 (60w)</td>
<td>0.0014</td>
<td>0.0023</td>
</tr>
<tr>
<td>9</td>
<td>Block Heater Timer (just timer)</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>10</td>
<td>Power Bar with integrated timer</td>
<td>0.0042</td>
<td>0.0024</td>
</tr>
<tr>
<td>11</td>
<td>Hot Water Tank Pipe Insulation - 1/2&quot; (Per 3 Feet) - Electric Water Heating Only</td>
<td>0.0029</td>
<td>0.0046</td>
</tr>
<tr>
<td>12</td>
<td>Hot Water Tank Pipe Insulation - 3/4&quot; (Per 3 Feet) - Electric Water Heating Only</td>
<td>0.0029</td>
<td>0.0046</td>
</tr>
<tr>
<td>13</td>
<td>Hot Water Tank Insulation - fibreglass R10 - Electric Water Heating Only</td>
<td>0.0286</td>
<td>0.0327</td>
</tr>
<tr>
<td>14</td>
<td>Low Flow Showerhead - Electric Water Heating Only</td>
<td>0.0280</td>
<td>0.0457</td>
</tr>
<tr>
<td>15</td>
<td>Low Flow Showerhead - Electric Water Heating Only</td>
<td>0.0280</td>
<td>0.0457</td>
</tr>
<tr>
<td>16</td>
<td>Low Flow Faucet Aerator (Kitchen Faucet 5.7 L/min) - Electric Water Heating Only</td>
<td>0.0131</td>
<td>0.0170</td>
</tr>
<tr>
<td>17</td>
<td>Low Flow Faucet Aerator (Bathroom Faucet 3.8 L/min) - Electric Water Heating Only</td>
<td>0.0225</td>
<td>0.0097</td>
</tr>
<tr>
<td>18</td>
<td>Refrigerator replacement (ENERGY STAR qualified 15.5 - 16.9 ft3)</td>
<td>0.0941</td>
<td>0.0862</td>
</tr>
<tr>
<td>19</td>
<td>Refrigerator replacement (ENERGY STAR qualified 17.0 - 18.4 ft3)</td>
<td>0.0941</td>
<td>0.0862</td>
</tr>
<tr>
<td>20</td>
<td>Refrigerator Replacement (10.0 - 12.5 cu ft)</td>
<td>0.0941</td>
<td>0.0862</td>
</tr>
<tr>
<td>21</td>
<td>Freezer replacement (ENERGY STAR qualified 12-14.4 ft3)</td>
<td>0.0881</td>
<td>0.0859</td>
</tr>
<tr>
<td>22</td>
<td>Freezer replacement (ENERGY STAR qualified 14.5 - 16.0 ft3)</td>
<td>0.0881</td>
<td>0.0859</td>
</tr>
<tr>
<td>23</td>
<td>Window air conditioner replacement (ENERGY STAR qualified 6,000 – 7,999 BTU/hr)</td>
<td>0.1235</td>
<td>0.1306</td>
</tr>
<tr>
<td>24</td>
<td>Window air conditioner replacement (ENERGY STAR qualified 8,000 – 9,999 BTU/hr)</td>
<td>0.1610</td>
<td>0.1649</td>
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<tr>
<td>25</td>
<td>Window air conditioner replacement (ENERGY STAR qualified 10,000 – 12,000 BTU/hr)</td>
<td>0.1975</td>
<td>0.2088</td>
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<tr>
<td>26</td>
<td>Dehumidifier replacement (ENERGY STAR qualified 14.2 - 21.2 l/day)</td>
<td>0.2802</td>
<td>0.1459</td>
</tr>
<tr>
<td>27</td>
<td>Dehumidifier replacement (ENERGY STAR qualified 21.3 - 25.4 l/day)</td>
<td>0.2802</td>
<td>0.1996</td>
</tr>
<tr>
<td>28</td>
<td>Dehumidifier replacement (ENERGY STAR qualified 25.5 - 35.5 l/day)</td>
<td>0.3189</td>
<td>0.2811</td>
</tr>
<tr>
<td>29</td>
<td>Programmable Thermostat – Baseboard</td>
<td>0.0000</td>
<td>0.0001</td>
</tr>
<tr>
<td>30</td>
<td>Programmable Thermostat – Electric Furnace</td>
<td>0.1757</td>
<td>0.0760</td>
</tr>
<tr>
<td>31</td>
<td>Comprehensive Draftproofing</td>
<td>kWh savings *</td>
<td>kWh savings *</td>
</tr>
<tr>
<td>Measure Number</td>
<td>Measure</td>
<td>Deemed kW</td>
<td>Recommended kW</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>----------------</td>
</tr>
<tr>
<td>32</td>
<td>Attic Insulation</td>
<td>0.0005</td>
<td>0.0004</td>
</tr>
<tr>
<td>33</td>
<td>Wall Insulation</td>
<td>kWh savings * 0.0080</td>
<td>kWh savings * 0.0004</td>
</tr>
<tr>
<td>34</td>
<td>Basement Insulation</td>
<td>kWh savings * 0.0005</td>
<td>kWh savings * 0.0004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kWh savings * 0.0287</td>
<td>kWh savings * 0.0004</td>
</tr>
</tbody>
</table>
For more information, please contact:

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Project Director

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aburke@opiniondynamics.com

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