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2014 Evaluation Report for the Aboriginal Conservation Program

October 29, 2015

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ACKNOWLEDGMENTS

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ABBREVIATIONS

ACP	Aboriginal Conservation Program
CF	Coincidence Factor
FAST	Field Audit Support Tool
FNESL	First Nations Engineering Services Ltd.
FR	Free-Ridership
HAP	Home Assistance Program
IESO	Independent Electricity System Operator
LDC	Local Distribution Company
NTGR	Net-to-Gross Ratio
PAC	Program Administrator Cost
SO	Spillover
TRC	Total Resource Cost

1. Executive Summary

The Independent Electricity System Operator (IESO) contracted with Opinion Dynamics Corporation (evaluation team) to conduct impact and process evaluations of the Aboriginal Conservation Program (ACP). This report presents the evaluation results covering the period from January 1, 2014 to December 31, 2014 (2014 program year).

The purpose of the ACP is to provide customized conservation services to First Nations communities, including distant northern communities, to reduce their electricity use and lower their monthly utility bills. The program is similar to the Home Assistance Program (HAP), providing the same suite of energy conservation measures to income-qualified homes in Ontario. The ACP, however, differs from the HAP in that its delivery focuses on specific preselected First Nations communities.

1.1 Summary of Evaluation Goals and Objectives

The 2014 ACP evaluation had the following objectives:

- Determine gross and net energy savings and peak demand reductions achieved in 2014
- Complete a limited process evaluation that identifies challenges associated with the implementation of the ACP and opportunities for improvements to its delivery

1.2 Summary of Impact Evaluation Results

The evaluation team verified the gross energy and demand savings claimed in the ACP participant database for projects completed in 2014. Income-qualified direct-install programs similar to the ACP typically assume a net-to-gross ratio (NTGR) of 1.0, as free-ridership (FR) and spillover (SO) are characteristically low. As such, 2014 net verified savings are equal to gross verified savings. Furthermore, given the accelerated time frame allotted for this evaluation, the evaluation team was unable to verify measure installation verification ratios via participant survey. Therefore, for the purposes of this evaluation, the evaluation team assumed 1.0 of all measures were both installed and remained installed throughout 2014.

Based on participant data records provided by the IESO, the evaluation team estimates that the ACP resulted in 549 kW of peak demand reduction and 3,101,207 kWh of energy savings in 2014, as shown in Table 1. The low kW realization rate is due to an older version of the Field Audit Support Tool (FAST) greatly overestimating demand savings for attic and basement insulation.

Table 1. Summary of 2014 Impact Evaluation Results

Component	Value
Number of Participants	1,125
Net Verified Demand Savings (kW)	549
Net Verified Annual Energy Savings (kWh)	3,101,207
Peak Demand Savings Realization Rate	15%
Energy Savings Realization Rate	97%

Impact Evaluation Findings:

- The ACP verified savings per project were considerably higher than similar income-qualified programs. The Home Assistance Program (HAP) provides the same suite of measures to low-income residential customers throughout Ontario. On average, ACP participants saved 2,760 kWh of energy and reduced their peak demand by 0.50 kW in 2014, compared with 770 kWh and 0.10 kW in savings for HAP customers over the same period. Driving these substantial differences is the greater share of ACP participants who receive weatherization measures: 22% of ACP participants receive insulation and draft proofing, compared with only 3% of HAP participants.

- Weatherization measures are responsible for the largest share of kW savings for the ACP in 2014 (59%) and 27% of estimated kWh savings, followed by lighting measures, providing 9% of the overall demand savings and 28% of energy savings. On average, projects with weatherization measures reduce participants' peak demand by 1.11 kW and save approximately 2,850 kWh more than projects that did not.

1.3 Summary of Process Evaluation Results

The process evaluation involved interviews with program and implementation staff; an analysis of program-tracking data; and a review of program documentation, such as program protocols and data collection tools.

Process Evaluation Findings:

- According to interviews with the program's implementer, First Nations Engineering Services (FNESL), program participation has grown steadily over the ACP's 2-year history, and is projected to continue on the same trajectory in 2015. The number of First Nations communities served by the ACP grew from 12 in 2013 to 17 in 2014. By the end of the 2014 program year, residents of 23% of all 126 First Nations communities in Ontario had the opportunity to participate in the ACP.

- FNESL, has created consistent service delivery across all program participants. In comparison, the HAP program employs at least four different delivery agents, some holding many varying contracts with the LDCs that they serve. Program offerings, therefore, can vary between delivery agents, and even between LDCs served by the same delivery agent. The single implementer allows for more consistent audits, measure delivery, participant education, and data collection.

- Though the program has seen a considerable amount of success to date, the ACP faces challenges associated with the compressed timelines that implementation staff have had to operate within. Applications from communities are due to IESO by January 31st, at which point they must be reviewed, scored, and selected communities must be approved by the Ontario Ministry of Energy. This process can take several months, meaning program delivery typically does not begin until April, allowing only 8 months for the implementation team to complete work in all of the communities selected for that program year.

- Another challenge faced by the ACP, particularly regarding the installation of weatherization measures, stems from the range and quality of housing stock present in First Nations communities throughout Ontario. The housing stock in targeted communities ranges from brand new homes to those that are far older and in very poor condition, where installing additional insulation either may be impractical or could lead to health and safety risks. For example, in some instances program, staff found a considerable amount of mold at prospective ACP homes, and additional insulation or air sealing measures could pose serious health threats to their occupants. Further, some properties

are in such disrepair that simply adding more insulation is an ineffective solution to a much more extensive problem.

1.4 Conclusions and Recommendations

- **The program administrator should conduct research on per-unit savings values and installation verification ratios for ACP measures.**

  Though the equipment installed by the ACP and HAP programs is the same, the programs themselves differ in their implementation strategies. The community-based approach, and increased attention given to each project, may result in different ratios of measures installed for a number of ACP measures. Also, given the differences in housing stock and weather conditions for some of the communities served through the ACP, several of the assumptions used in deriving the deemed savings values for HAP measures may require amendment.

- **The program administrator should consider conducting research on additional savings attributable to the program's educational component.**

  The ACP's focus on community engagement may have a greater impact on participant education and awareness of energy efficiency. The evaluation team recommends, through the 2015 evaluation of the ACP, that the program administrator conduct additional research on behavioral change attributable to the program, and any additional savings that may result. Further, explore the feasibility of conducting a billing analysis to capture both equipment-, and behavior-related savings.

- **The program administrator should continue to work on expediting approval for First Nations communities to be served by the ACP in any given program year.**

  One of largest challenges to successfully implementing the ACP in 2014 and 2013 was operating in a condensed timeline. Program staff acknowledge that the IESO has worked to mitigate this issue. However, the evaluation team recommends that the program administrator continue to seek ways of expediting the approval process for communities served by the ACP, such as beginning the process earlier and obtaining approval for multiple years or the entire program cycle.

2. Introduction

This report presents the results of Opinion Dynamics Corporation's (evaluation team) evaluation of the Aboriginal Conservation Program (ACP). Below are the objectives of the impact and limited process evaluations, the first in the ACP's 2-year history, followed by an overview of the program's purpose and goals. Finally, the evaluation team provides an overview of the structure and content of this evaluation report.

2.1 Evaluation Objectives

The 2014 ACP evaluation had the following objectives:

- Determine gross and net energy savings and peak demand reductions achieved in 2014
- Complete a limited process evaluation that identifies challenges associated with the implementation of the ACP and opportunities for improvements to its delivery

2.2 Program Purpose

The purpose of the ACP is to provide customized conservation services to First Nations communities, including distant northern communities, to reduce their electricity use and lower their monthly utility bills. The program is similar to the Home Assistance Program (HAP), providing the same suite of energy conservation measures to income-qualified homes in Ontario. The ACP, however, differs from the HAP in that its delivery focuses on specific preselected First Nations communities.

2.3 Program Goals

The ACP expects to realize the following goals:

- Improvements to the electric efficiency of housing stock within First Nations communities throughout Ontario
- Electricity demand reductions and energy savings
- Adoption of conservation behaviors by participating First Nations households
- Improvements in the knowledge of First Nations Ontarians on how to effectively manage electricity costs
- Support for utility service continuity
- Coordination of the delivery of electric and natural gas customer offerings for eligible communities

The Independent Electricity System Operator (IESO) funds and the local distribution companies (LDCs) deliver the ACP through First Nations Engineering Services Ltd. (FNESL), the province-wide program manager selected to implement the ACP. Eligible participants receive the following measures and their installation at no charge:

- Basic measures: screw-in light bulbs, block heater timer, smart power bar, efficient shower heads, faucet aerators, and hot water pipe wrap/tank insulation

- Extended measures: ENERGY STAR® refrigerators, freezers, window air conditioning units, dehumidifiers, and programmable thermostats
- Weatherization measures: draft proofing, attic insulation, wall insulation, and basement insulation

Eligibility for the program is based on residential customers living within preselected First Nations communities targeted by the ACP for a given program year.

3. Impact Evaluation

In this section, the evaluation team presents the methods, results, and recommendations from the impact evaluation of the ACP for the 2014 program year. This section includes a comparison of estimated demand and energy savings determined through the evaluation (verified savings) to the expected impacts used for program tracking (reported savings). The evaluation team used the most detailed measure-level data available from the program-tracking systems as the basis for estimating verified savings and measure-level savings estimates.

3.1 Methodology

The evaluation team's determination of verified savings consisted of several steps. The first step involved a thorough review of the program-tracking data and cleaning of erroneous records. The appropriate updated deemed savings values (as evaluated in 2013 for the HAP program) were applied to each measure in the cleaned data set. To arrive at net impacts, the evaluation team applied a net-to-gross ratio (NTGR) of 1.0 at the program level. Each of these steps is described in more detail below.

For analysis and reporting purposes, the evaluation team grouped individual ACP measures into broader categories based on similarity of equipment and savings assumptions. All savings and other factors were calculated at the individual measure level, and then aggregated savings into the associated measure group. Appendix A provides a complete list of ACP measures and their associated categories.

3.1.1 Program-Tracking Data Review

The evaluation team reviewed the reported program participation data and identified and corrected data quality issues, such as duplicate records, missing data, and outliers.

The IESO provided a file with 2,449 records in Microsoft Excel format, which was the basis of the program-tracking data review. From this data set, the evaluation team removed 144 records with no audit date and thus savings could not be assigned to a program year. Of the remaining 2,305 records, 311 records were completed in 2013. The evaluation team then condensed the remaining 1,994 observations into 1,177 unique projects, based on unique Field Audit Support Tool (FAST) file IDs. The majority of these were not duplicates, but rather, given the need for multiple visits to each site, had information associated with certain measures broken out between multiple observations each recorded separately in the database. Finally, the evaluation team removed 52 projects that had no energy or demand savings associated with them and no information on measure quantities installed, resulting in a final count of 1,125 unique projects for 2014. Additionally, the evaluation team updated the kW savings ratios for all of the measures installed in the ACP by applying methods in the EM&V Protocols (STG-10). A complete list of the deemed savings values used for this ACP impact evaluation can be found in Appendix E. As part of the evaluation of the 2015 ACP, we will update these deemed savings values based on assumptions specific to ACP projects.

3.1.2 Savings Assumptions

After cleaning the ACP program-tracking data, we applied the per-unit deemed savings to each measure installed in 2014. As part of the evaluation of the HAP in 2011/2012, the evaluation team completed a review of the deemed savings assumptions for non-weatherization measures. The program does not deem weatherization measures; instead, they are calculated through HOT2000 modelling by FNESL. Through this review, the evaluation team recommended changes to deemed energy savings values for four ACP

measures. We also recommended changes to ratios used to estimate demand reduction for all 29 measures installed through the ACP. A complete list of the changes recommended by the evaluation team are included in Appendix E.

3.1.3 Installation Verification Ratio

Given the abbreviated timeline for completing this evaluation, the evaluation team was unable to conduct a participant survey; we therefore set the installation verification ratio to 1.0 for all measures. In subsequent evaluations, the evaluation team anticipates verifying measure installations through a participant survey.

3.1.4 Net-to-Gross Ratio

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

In 2013, the evaluation team tested these assumptions in an evaluation of the HAP, a similar income-qualified direct-install program. The evaluation team conducted NTGR research through a survey of program participants and found both FR and SO rates to be very low. For this reason, in the 2014 impact evaluation of the ACP, the evaluation team assumed a NTGR of 1.0 when reporting net savings values. Details on the methods and results of this 2013 NTGR research can be found in the 2013 HAP Evaluation Report.

3.2 Results

Using the methods described above, the evaluation team calculated the net verified energy and demand savings for the 1,125 ACP projects completed in 2014. The evaluation team compared verified savings to the measure- and project-level reported savings to calculate the realization rates at the project and program levels. Table 2 summarizes the program-level results.

Table 2. ACP Verified Net Savings (2014)

Savings Type	Reported Savings*	Verified Savings	Realization Rate
kW	3,781	549	15%
kWh	3,211,823	3,101,207	97%

* These values are based on the reported savings for the project in the data set cleaned by Opinion Dynamics.

Realization rates for energy savings for 2014 were very high (97%). The low realization for peak demand (15%) is due almost exclusively to the FAST greatly overestimating demand reduction for weatherization measures, specifically attic and basement insulation. For both measures, demand reductions estimated by the FAST were more than 10 times the verified estimates.

The greatest share of energy and demand savings are attributable to weatherization measures. As shown in Figure 1, weatherization measures are responsible for close to 60% of the program's estimated demand reduction—attic, basement, and wall insulation alone account for roughly 55% of the ACP's demand savings. While lighting measures are credited with the largest share of energy savings (28%), weatherization measures are still responsible for a substantial share, at 27% (see Figure 2).

Figure 1. Percent of Verified kW Savings by Measure Group

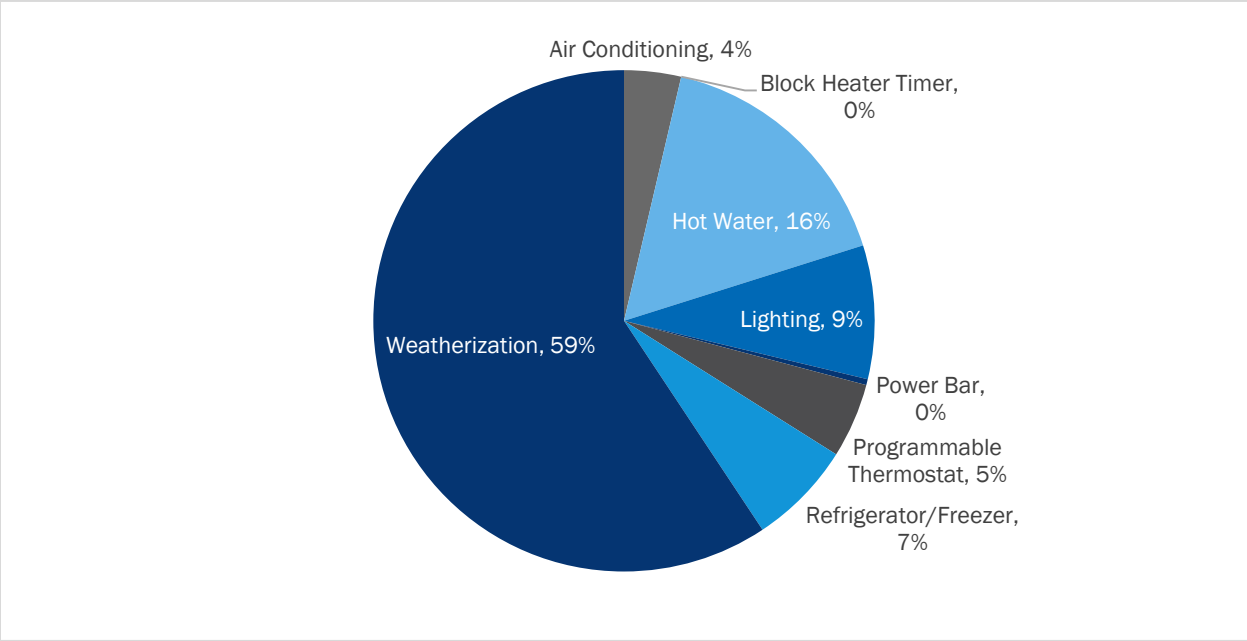


Figure 2. Percent of Verified kWh Savings by Measure Group

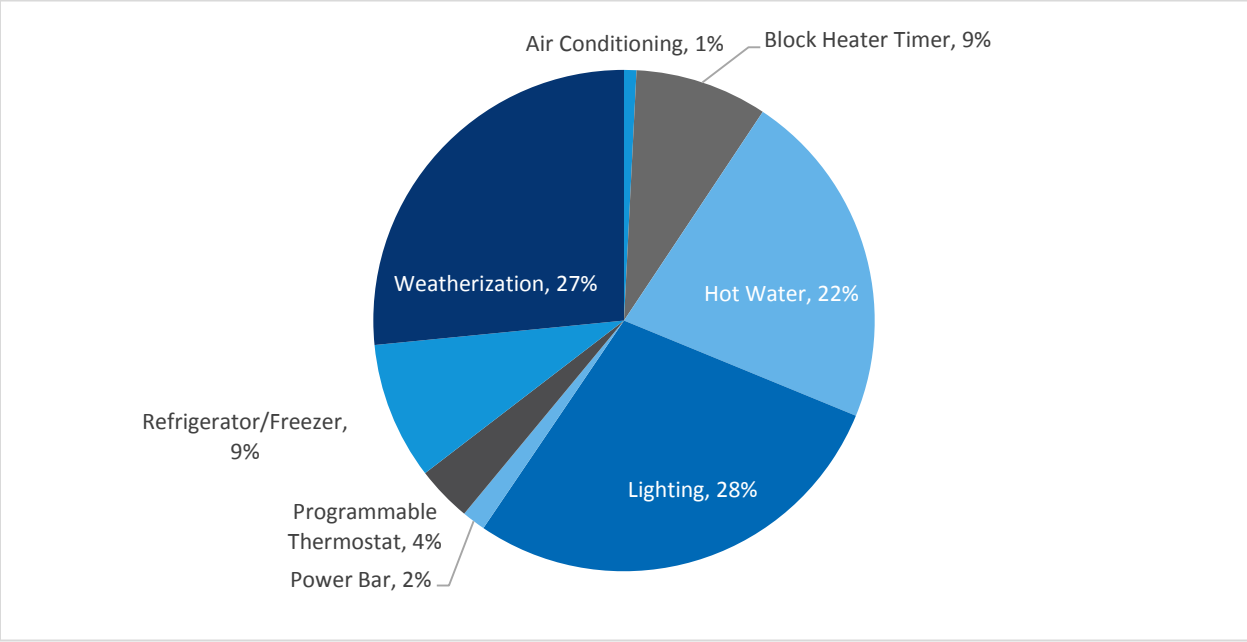


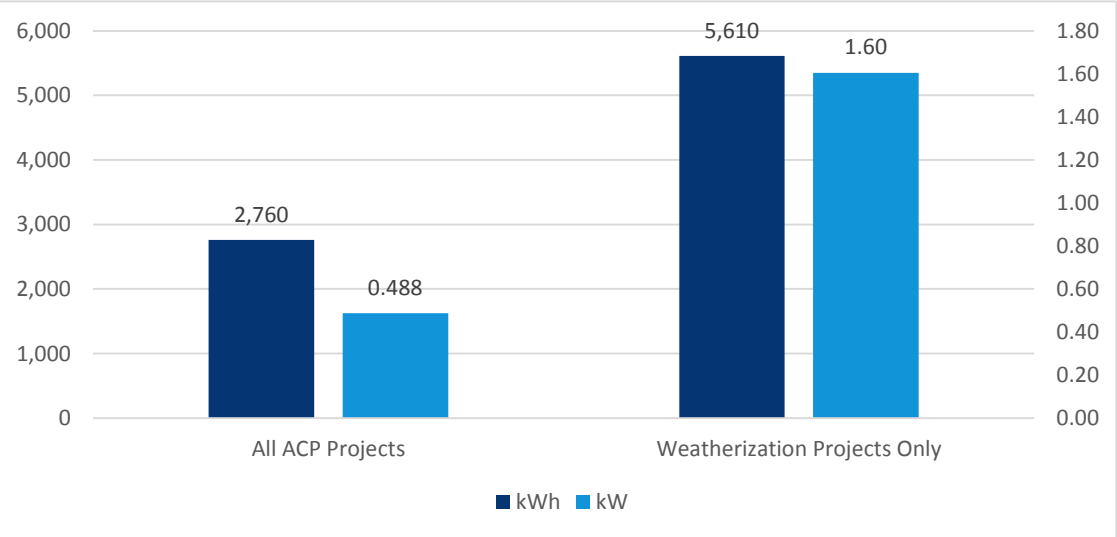
Table 3 below shows the ten individual measures responsible for the largest portion of demand savings, and the share of total participants that received them.

Table 3: Top Ten Demand Reduction (kW) Measures in 2014

ACP Measure	kW	kWh	Unique Participants	Percent of Participants That Received	Measure Quantity
Basement Insulation	106.35	269,120	78	7%	48,401
Attic Insulation	98.72	249,826	202	18%	191,785
Wall Insulation	96.58	244,410	55	5%	13,727
ENERGY STAR qualified CFL twister (60w)	38.66	744,280	1,042	93%	16,180
Programmable Thermostat – Low Voltage	26.35	66,681	27	2%	31
Comprehensive Draft-Proofing	23.80	60,232	116	10%	12,184
Efficient Shower Heads (standard) < 4.8 L/min	23.50	193,778	505	45%	514
Refrigerator Replacement (ENERGY STAR qualified 15.5–16.9 cu feet)	15.68	116,775	173	15%	173
Low-Flow Faucet Aerator (bathroom faucet < 3.8 L/min) - Electric Water Heating Only	14.09	58,400	707	63%	730
Efficient Shower Heads (hand-held) < 4.8 L/min	13.99	115,362	300	27%	306

Per-project savings for the ACP were substantially higher than those for the HAP, a similar program offering the same suite of measures to income-qualified residential customers. On average, HAP participants saved approximately 770 kWh and reduced their peak demand by 0.10 kW in 2014, compared with 2,760 kWh and 0.50 kW for ACP participants. This is due largely to a much higher proportion of ACP projects that included weatherization measures (22%), compared with only 3% of HAP projects. As illustrated in Figure 3, projects that installed weatherization measures saved an average of 2,850 kWh and 1.11 kW more than typical ACP participants.

Figure 3. Per-Project Savings Comparisons



3.3 Recommendations

Based on the findings discussed above, the evaluation team makes the following recommendations.

- **The program administrator should conduct research on per-unit savings values and installation verification ratios rates for ACP measures.**

  Though the equipment installed by the ACP and HAP programs is the same, the programs themselves differ in their implementation strategies. The community-based approach, and increased attention given to each project, may result in different ratios of measures installed for a number of ACP measures. Also, given the differences in housing stock and weather conditions for some of the communities served through the ACP , several of the assumptions used in deriving the deemed savings values for HAP measures may require amendment.

4. Process Evaluation

4.1 Methodology

For 2014, the evaluation team was able to complete a limited process evaluation of the ACP based predominantly on interviews with program staff, analyzing program-tracking data, and reviewing program documentation. Interviews with program staff, including the ACP's implementation contractor FNESL, served four primary purposes:

1. To develop an understanding of program goals, the delivery strategies used to obtain goals, and the staff and stakeholders' perspective on the effectiveness of each strategy
2. To better understand participant education that may drive behavioral changes
3. To better understand the program-tracking systems, quality assurance procedures, and audit process and documentation
4. To better understand alternative program technologies and designs that could be tested through research

The evaluation t eam's Project Manager and lead Project Analyst conducted all interviews with program staff in July of 2015. This consisted of interviews with the ACP program lead at the IESO, and with two representatives at FNESL, one of whom had worked on the ACP since its inception in 2013.

4.2 Results

The ACP, serves specific First Nations communities throughout Ontario. Implemented by FNESL, an Aboriginal-owned engineering company, the delivery strategy for this program is to focus on reaching the entire community, as opposed individual residential customers. As such, for each community, FNESL organizes a community launch event where eligible residents are introduced to the program, given some background on the different energy-saving technologies they may be eligible for, and provided with information about how to sign up. Gaining the trust of the community and providing energy education are critical components of the ACP. As such, the community launch events provide an important setting for program implementation staff to meet with community members, explain why the program is valuable, and inform them about the most effective ways to reduce their energy consumption.

Additionally, the ACP employs a single delivery agent, FNESL, to implement the program. This strategy both contributes to the program's efficient delivery and its consistency. In comparison, the HAP program employs at least four different delivery agents, some holding many contracts with the LDCs they serve. Program offerings, therefore, can vary between delivery agents, and even between contracts held by the same delivery agent. With a single implementer, the program administrator is ensured similar installation practices, data collection, and delivery of educational content across the entire program. This allows for easier comparisons between participants, and thus the ability to isolate successful aspects of the program, and differentiate from those that are less so. Additionally, contracting with a single delivery agent allows the program administrator to make adjustments to service delivery more efficiently.

The number of First Nations communities served by the ACP grew from 12 in 2013 to 17 in 2014, as shown in Table 4. By the end of the 2014 program year, residents of 23% of all 126 First Nations communities in Ontario had the opportunity to participate in the ACP.

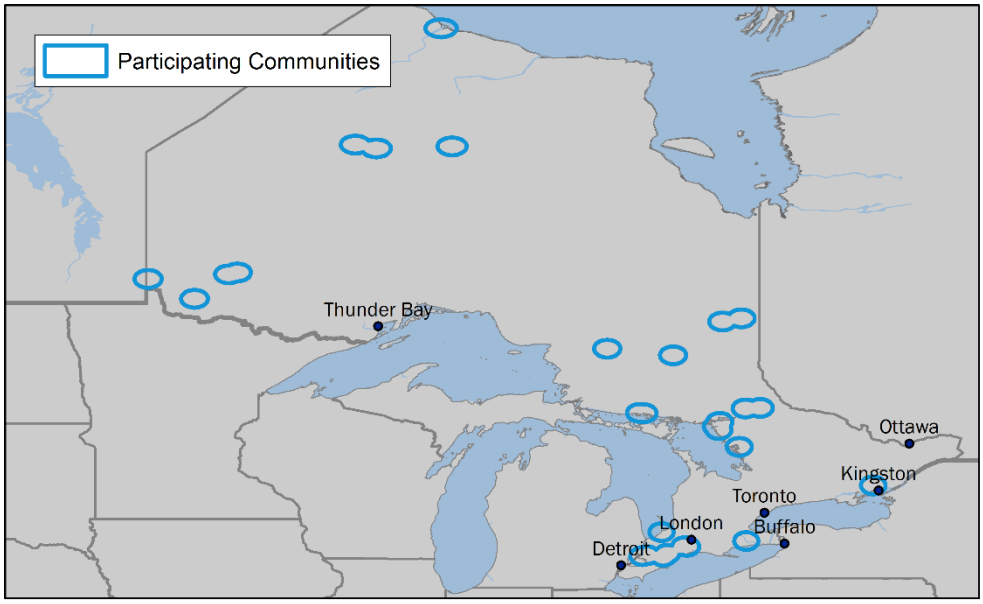
Table 4. ACP Participation Year over Year

Program Year	Calendar Year	Number of Communities (total = 126)*	Percent per Year	Cumulative Percent of Communities Reached
1	2013	12	10%	10%
2	2014	17	13%	23%
3	2015	16**	13%	36%

* Source: Interview with ACP implementation contractor FNESL, on July 7, 2015.
** Estimated.

Figure 4 shows the 17 communities served by the ACP in 2014. The communities are distributed throughout the province and many are located far from population centers. The distances between communities and the distance from population centers pose logistical challenges unique to the ACP.

Figure 4. 2014 Participating ACP Communities



4.2.1 Challenges

Though the program has seen a considerable amount of success to date, the ACP faces a number of implementation challenges. The main challenge reported by program implementers stems from the compressed timelines that implementation staff have had to operate within. Applications from communities are due to IESO by January 31st, at which point they must be reviewed, scored, and selected communities must be approved by the Ontario Ministry of Energy. This process can take several months, meaning program delivery typically does not begin until April, allowing only 8 months for the implementation team to complete work in all of the communities selected for that program year.

This consolidated timeline is particularly challenging for the ACP, given the time required to build trust in each community and the range of logistics and custom arrangements necessary when delivering both basic and extended measures to remote communities. Each ACP project requires an initial energy assessment, during which all basic measures—such as CFLs, faucet aerators, and power bars—are installed. Information on the home is then sent from the auditor to FNESL, where it is determined if the household is eligible for up

to three additional installation visits: one visit from the program insulation contractor to deliver weatherization measures, one from the ACP's appliance contractor for delivery of new appliances and disposal of the old, and one from a local electrician to install a programmable thermostat. Finally, each home is visited by a program representative to verify that it received each measure it qualified for and that everything was installed properly.

Another challenge faced by the ACP, particularly regarding the installation of weatherization measures, stems from the range and quality of housing stock present in First Nations communities throughout Ontario. Housing stock in targeted communities range from brand new homes to those that are far older and in very poor condition, where installing additional insulation may either be impractical or could lead to health and safety risks. For example, in some instances program, staff have found a considerable amount of mold at prospective ACP homes, and additional insulation or air sealing measures could pose serious health threats to its occupants. Further, some properties are in such disrepair that simply adding more insulation is an ineffective solution to a much more extensive problem.

4.3 Recommendations

The evaluation team provides recommendations below based on the findings discussed in Section 4.2.

- **The program administrator should consider conducting additional research on additional savings attributable to the program's educational component.**

  The ACP's focus on community engagement may have a greater impact on participant education and awareness of energy efficiency. The evaluation team recommends, through the 2015 evaluation of the ACP, that the program administrator conduct additional research on behavioral change attributable to the program, and any additional savings that may result. Further, we suggest exploring the feasibility of conducting a billing analysis to capture both equipment-, and behavior-related savings.

- **The program administrator should continue to work on expediting approval for First Nations communities to be served by the ACP in any given program year.**

  One of largest challenges to successfully implementing the ACP in 2014 and 2013 was operating in a condensed timeline. Program staff acknowledge that the IESO has worked to mitigate this issue. However, we recommend that the program administrator continue to seek ways of expediting the approval process for communities served by the ACP, such as beginning the process earlier and obtaining approval for multiple years or the entire program cycle.

Appendix A. Measures and Measure Categories

Measure Number	Measure Category	Simplified Measure Name	ACP Measure
1	Lighting	Screw-in CFL	ENERGY STAR qualified CFL twister (60w)
2	Lighting	Screw-in CFL	ENERGY STAR qualified CFL twister (75w)
3	Lighting	Screw-in CFL	ENERGY STAR qualified CFL twister (100w)
4	Block Heater Timer	Block Heater Timer	Block Heater Timer (just timer)
5	Power Bar	Power Bar	Power Bar with integrated timer
6	Hot Water	Hot Water Tank Pipe Insulation	Hot Water Tank Pipe Insulation - ½" (per cu foot)
7	Hot Water	Hot Water Tank Pipe Insulation	Hot Water Tank Pipe Insulation - ¾" (per cu foot)
8	Hot Water	Hot Water Tank Insulation	Hot Water Tank Insulation - Fiberglass R10
9	Hot Water	Efficient Shower Head	Efficient Shower Head (standard) < 4.8 L/min
10	Hot Water	Efficient Shower Head	Efficient Shower Head (hand-held) < 4.8 L/min
11	Hot Water	Faucet Aerator	Low-Flow Faucet Aerator (kitchen) < 5.7 L/min
12	Hot Water	Faucet Aerator	Low-Flow Faucet Aerator (bathroom) < 3.8 L/min
13	Refrigerator/Freezer	Refrigerator	Refrigerator Replacement (ENERGY STAR qualified 15.5–16.9 cu ft)
14	Refrigerator/Freezer	Refrigerator	Refrigerator Replacement (ENERGY STAR qualified 17.0–18.4 cu ft)
15	Refrigerator/Freezer	Refrigerator	Refrigerator Replacement (10.0–12.5 cu feet)
16	Refrigerator/Freezer	Freezer	Freezer Replacement (ENERGY STAR qualified 12.0–14.4 cu feet)
17	Refrigerator/Freezer	Freezer	Freezer Replacement (ENERGY STAR qualified 14.5–16.0 cu feet)
18	Air Conditioner/ Dehumidifier	Room Air Conditioner	Window Air Conditioner Replacement (ENERGY STAR qualified 6,000–7,999 BTU/hr)
19	Air Conditioner/ Dehumidifier	Room Air Conditioner	Window Air Conditioner Replacement (ENERGY STAR qualified 8,000–9,999 BTU/hr)
20	Air Conditioner/ Dehumidifier	Room Air Conditioner	Window Air Conditioner Replacement (ENERGY STAR qualified 10,000–12,000 BTU/hr)
21	Air Conditioner/ Dehumidifier	Dehumidifier	Dehumidifier Replacement (ENERGY STAR qualified 14.2–21.2 L/day)
22	Air Conditioner/ Dehumidifier	Dehumidifier	Dehumidifier Replacement (ENERGY STAR qualified 21.3–25.4 L/day)
23	Air Conditioner/ Dehumidifier	Dehumidifier	Dehumidifier Replacement (ENERGY STAR qualified 25.5–35.5 L/day)
24	Programmable Thermostat	Programmable Thermostat	Programmable Thermostat – Line Voltage
25	Programmable Thermostat	Programmable Thermostat	Programmable Thermostat – Low Voltage
26	Weatherization	Weatherization Measure	Comprehensive Draft-Proofing
27	Weatherization	Weatherization Measure	Attic Insulation
28	Weatherization	Weatherization Measure	Wall Insulation
29	Weatherization	Weatherization Measure	Basement Insulation

Appendix B. Verified Savings by Measure

ACP Measure	kW	kWh	Unique Participants	Measure Quantity
Attic Insulation	98.72	249,826	202	191,785
Basement Insulation	106.35	269,120	78	48,401
Comprehensive Draft-Proofing	23.80	60,232	116	12,184
Wall Insulation	96.58	244,410	55	13,727
Efficient Shower Heads (hand-held) < 4.8 L/min	13.99	115,362	300	306
Efficient Shower Heads (standard) < 4.8 L/min	23.50	193,778	505	514
Hot Water Tank Insulation - Fiberglass R10 - Electric Water Heating Only	13.26	109,350	405	405
Hot Water Tank Pipe Insulation - ½" (per cu foot)	11.92	98,306	378	2,587
Hot Water Tank Pipe Insulation - ¾" (per cu foot)	0.12	950	3	25
Low-Flow Faucet Aerator (bathroom faucet < 3.8 L/min) - Electric Water Heating Only	14.09	58,400	707	730
Low-Flow Faucet Aerator (kitchen faucet < 5.7 L/min) - Electric Water Heating Only	13.46	101,780	726	727
ENERGY STAR qualified CFL twister (100w)	8.43	129,885	637	2,194
ENERGY STAR qualified CFL twister (60w)	38.66	744,280	1,042	16,180
ENERGY STAR qualified CFL-PAR38 (100w indoor)	0.15	2,828	8	28
Freezer Replacement (ENERGY STAR qualified 12.0–14.4 cu feet)	4.72	34,815	55	55
Freezer Replacement (ENERGY STAR qualified 14.5–16.0 cu feet)	3.43	25,320	40	40
Refrigerator Replacement (10.0–12.5 cu feet)	2.80	20,896	32	32
Refrigerator Replacement (ENERGY STAR qualified 15.5–16.9 cu feet)	15.68	116,775	173	173
Refrigerator Replacement (ENERGY STAR qualified 17.0–18.4 cu feet)	10.34	76,950	114	114
Programmable Thermostat – Line Voltage	0.06	44,352	156	704
Programmable Thermostat – Low Voltage	26.35	66,681	27	31
Dehumidifier Replacement (ENERGY STAR qualified 14.2–21.2 L/day)	0.88	2,910	6	6
Dehumidifier Replacement (ENERGY STAR qualified 21.3–25.4 L/day)	0.20	664	1	1
Dehumidifier Replacement (ENERGY STAR qualified 25.5–35.5 L/day)	1.40	4,670	5	5
Window Air Conditioner Replacement (ENERGY STAR qualified 10,000–12,000 BTU/hr)	3.13	2,925	15	15
Window Air Conditioner Replacement (ENERGY STAR qualified 6,000–7,999 BTU/hr)	10.06	9,394	77	77
Window Air Conditioner Replacement (ENERGY STAR qualified 8,000–9,999 BTU/hr)	4.45	4,158	27	27
Power Bar with integrated timer	2.10	47,276	892	892
Block Heater Timer (just timer)	0.00	264,915	401	406

Appendix C. Program Manager Interview Guide

Purpose

This interview guide will be used to support the process evaluation of IESO's Aboriginal Conservation Program. The interviews will be conducted by Opinion Dynamics staff. We will complete 1–2 interviews with IESO Program Managers, identified by the IESO as the best resources of information regarding the Aboriginal Conservation Program.

These interviews will serve six primary purposes to:

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

2) Better understand participant outreach and education

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

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

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

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

7) Understand how the structure and delivery strategies of the ABORIGINAL CONSERVATION PROGRAM will change moving forward?

Introduction

I would like to ask you some questions about your experience with the Aboriginal Conservation Program, and allow you to raise any issues or concerns you might have regarding program operation or procedures. We are familiar with the Home Assistance Program, but would like to understand how this program is different, and more about some of the unique challenges that it faces.

Background

B1. What is your role at the IESO?

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

B2a. Can you provide a brief overview of this program's history? How long has it been in operation?

B3. Were there any changes to the program implementation or structure from 2013 to 2014?

B3a. We understand the program will be ending in after the 2015 program year? Is this correct? If so, why? Is there anything that is expected to take this program's place?

B4. What are the approximate 2014 participation levels in the program for both participants and LDCs? Has participation met your expectations? If not, why?

- B4a. Approximately how much of 2014 participants do you estimate coming from social housing communities?

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

- 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 IESO in attaining these goals?

B6. What changes to the Aboriginal Conservation Programs program's design (including incentive structure, audit requirements, verification and reporting) do you expect moving forward?

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

B8. To your knowledge, are there any fundamental differences in the mix of measures these participants receive compared with HAP participants?

B9. Can you briefly describe the unique challenges associated with this program (*i.e. language*)? How do these differ from the HAP? (*If not already spoken about*) Are there any challenges associated implementing this program in more remote/northern areas?

Organization Relationships

R1. In addition to the LDCs and First Nations Engineering Service Ltd, are there other organizations involved with implementing the program and what are their specific roles? How do they interact?

R2. Can you briefly describe the function of First Nations Engineering Service Ltd with implementing this program? (*Probe for any additional functions that this group fulfills beyond that of a standard Delivery Agent for the HAP, i.e. training residents of local reservations as auditors, outreach, etc.)*

R3. Do the gas companies have any role in promoting and/or implementing the program? If so, what is their role?

R3a. How effective is communication and cooperation between IESO and other participating organizations and stakeholders, such as the natural gas companies?

R3. Can you describe the working relationship between the IESO and the LDCs for this program specifically? Does this program require additional coordination beyond what is required for the HAP? If so, what is required?

R3a. What has worked in the past and what hasn't?

R3b. How will the program structure moving forward address these challenges?

R5. How much interaction does IESO have with First Nations Engineering Services Ltd? Are the LDCs the first point of contact, or does IESO interact directly with them?

R6. Do local tribal councils play a role in administering this program? If so, please describe?

R7. We would like to conduct additional interviews with representatives at participating LDCs, First Nations Engineering Services Ltd, and (if appropriate) representatives of some of participating tribal councils. Would you be able to put us in touch with the appropriate contacts?

Program Marketing/Outreach

M1. What are the primary means of gaining participation?

M2. How did the IESO market the program in 2014? How was this coordinated with other stakeholders (i.e. local governments, gas companies, LDCs, delivery agents)?

M3. How is the marketing budget determined? Will this process change in 2015?

M4. How has the IESO supported (i.e., funding and other assistance) the marketing done by partner organizations?

M6. 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)

M7. What do you think are the most successful channels for generating participation? How do you expect these channels to be used in future years?

Program Data Collection, Processing and Tracking

D1. What is the application process for the program (i.e. necessary forms and data that are tracked)? Has this process changed from 2013 to 2014? Do you expect changes to the application process moving forward?

D1a. Were application forms from 2014 developed by the LDCs or the IESO?

D1b. Is the current process for getting information to the IESO similar, or the same, as it is for the HAP?

D2. Does the Aboriginal Conservation Program use the FAST in the same way that it is used for the HAP? From 2013 to 2014, have there been any changes to how the LDC's and First Nations Engineering Services Ltd use 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?

D3. Do weatherization audits, the modeling software, and the data collected during these audits differ from what is done for the HAP?

D3a. Does the IESO do any QA/QC on the model results?

D3b. Where are the modeling files maintained? Does the IESO get the modeling files from the (LDCs/Implementer)?

D3c. How do the LDCs bill the IESO for the weatherization audits and any measures installed during the weatherization audits?

D3d. Do you think it would be feasible, from an administrative perspective, to move towards deemed savings values for weatherization measures?

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 IESO for reimbursement of measures? What forms are filled out and submitted?

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

Participant Experience

E1. What portion of participants are in multifamily buildings?

E2. How does this group of program participants differ from HAP participants?

E6. Is the educational component of the program *required* by the IESO? If so, is there a verification process?

E6a. Has the IESO offered any support to LDCs and First Nations Engineering Services Ltd, in terms of materials and auditor guidelines for customer engagement, in the past?

E6a. Do you expect any changes to this component of the program moving forward? Would you be able to share the new educational materials with us?

E7. Have participants requested any additional measure types? Are any additional measures or incentives being considered, or a restructuring of existing ones?

Conclusion

C1. Reflecting on how the program has operated over the past 2 years, how well do you think the program has met its goals?

C1a. As we understand it, one of the goals of this program is to contribute to the local economies of participating communities by creating jobs. How does of the program achieve this goal? How well do you think the program has met this specific goal?

C2. Are there any other barriers or challenges associated with this program specifically that we haven't discussed yet? If so, what are they? How will changes to the program and design and implementation address these?

C3. Do you have any thoughts on how the program can be, or will be, changed moving forward to lessen the administrative burden on the IESO, LDCs, delivery agents, and participants?

C4. Finally, do you have any other comments or recommendations concerning the program that you would like to share?

Appendix D. Delivery Agent Interview Guide

Purpose

This interview guide will be used to support the process evaluation of the Aboriginal Conservation Program (ACP). The interviews will be conducted by telephone by Opinion Dynamics staff. We will complete in-depth interviews with FNESL managers implementing the program.

These interviews will serve four primary purposes:

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

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

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

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

Background

S1. Our records show that you are currently the contact at First Nations Engineering Services, Ltd. (FNESL) for the ACP. Is this correct?

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

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

B1. What is your role at FNESL and your involvement with the ACP?

B2. Is there any interaction with LDCs, or do you primarily communicate directly with the IESO?

B2a. [IF INTERACT WITH LDCs] What is the extent of your communication/coordination?

B4. Can you describe the working relationship between FNESL and the IESO?

B4a. What are your respective roles in implementing the programs?

B4b. What is working?

B4c. What is not working?

B5. Can you briefly describe what has changed from program year to program year over the first three years of the program? (i.e. how did the different time-line for the first two program year's affect implementation?)

B6. Other than the different timeline for each program year, were there any other barriers or challenges associated with implementation of the Program? Do any of these challenges vary depending upon the community you are serving?

B7. What types of information, materials, guidance, or tools do you provide each community? How does FNESL work with each community to implement the program?

B8. Can you briefly describe your process

[ASK IF INTERVIEWED IN 2013]

B8. Has your role changed at all over the past year at FNESL?

B9. Has anything changed with how FNESL administers or implements the ACP over the past year?

Organization Relationships

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

R1. What other organizations, besides LDCs and the IESO, do you work with to implement the ACP? What are their roles? [PROBE FOR MARKETING ORGANIZATIONS, OUTREACH ORGANIZATIONS, SUB-CONTRACTORS, ETC.]

R2. Have you worked with the gas utilities to deliver the ACP?

R2a. How effective is communication and coordination between program implementation staff and participating organizations and stakeholders, such as the natural gas companies?

R2b. What are the primary areas for improvement?

Program Marketing/Outreach

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

M2. How do you recruit participants?

M2a. What is your role in putting on community launch events?

M2b. Does your marketing approach differ by Community?

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?

M7. Do the band councils provided any kind of marketing materials or support? [IF YES] Are you able to share these materials with us?

M6a. Does IESO provide any marketing materials? [IF YES] Are you able to share these materials with us?

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

M9. How is your marketing budget determined?

Program Data Collection, Processing and Tracking

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

D1a. How is the information transferred between the LDCs and FNESL?

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

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

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

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

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

D3. Does FNESL offer weatherization measures to qualifying participants?

D3a. Additionally, can you describe how the differences in housing stock, and general housing quality, affects your ability to offer weatherization measures in certain communities?

D4. Describe the Extended Audits and the information collected.

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

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

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

D4d. Does FNESL do any QA/QC on the model results?

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

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

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

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

D4i. In general, what do you think about how FAST handles weatherization measures?

D5. Are any other data collection instruments used during the audits? If so, what information is collected and how is it used and where is it maintained?

D6. Describe the verification process.

D6a. When are verification audits conducted? By whom?

D6b. What information is collected during the verification audits?

D6bi. Is this process different depending on which measures are installed (i.e. is there a different process for verifying weatherization measures)?

D6c. What forms are used? Can we review examples of completed forms?

D6d. How is the information from the verifications used?

D7. Describe the reimbursement process.

D7a. How does FNESL submit requests for reimbursement of measures to the IESO?

D7b. How do the LDCs provide reimbursement for outreach, marketing, and any additional administrative costs (i.e. travel costs, and equipment transport to and from remote areas)?

Participant Experience

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

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

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

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

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

E5. Are auditors trained in participant engagement?

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

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

E8. How is participant engagement verified?

E8a. Does FNESL use any sort of follow-up customer satisfaction survey?

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

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

FNESL Participation in Program

L1. Does FNESL have specific goals for participation levels in the HAP for each LDC?

- L1a. How are these goals determined? Do you expect these to change moving forward?
- L1b. What were the primary energy and non-energy goals of the Initiative in 2014?
- L1c. Are you on track to meet the 2015 goals?
- L1d. What are the main challenges for FNESL in attaining these goals?
- L1e. Are there any aspects of the program that you feel are unnecessarily burdensome on you? Auditors? Participants?

L2. Finally, do you have any other comments or recommendations concerning the ACP that you would like to share?

Appendix E. Savings Assumptions

The following tables show the results of our review of program savings assumptions for both energy and demand savings for the 2011/2012 evaluation of the HAP. We have included the results below for measures that are also installed through the ACP.

Energy Savings

Table 5 shows the changes recommended to deemed kWh savings values for four measures installed in both the HAP and the ACP. More detailed information on these recommendations can be found in our 2011/2012 and 2013 evaluation reports for the HAP. The table includes past kWh savings assumptions, which may be present in older versions of the FAST, alongside the present deemed savings values used to calculate verified savings for this evaluation. No additional changes were recommended to deemed savings values in the 2014 evaluation.

Table 5. Recommended Changes in Deemed kWh Values

Measure	Old kWh	Present kWh	Reason for Change
Low-Flow Aerator (Kitchen) < 5.7 L/min	176	140	Reduced energy needed to heat water based on temperature increase of 15.7 degrees C from 44 degrees C in the IESO measures assumptions (assumes a mixed water temperature of 26.7 and an inlet water temperature of 11.0)
Low-Flow Aerator (Bathroom) < 3.8 L/min	291	80	
Dehumidifier Replacement (ENERGY STAR 21.3–25.4 L/day)	485	664	Increased efficiency of efficient dehumidifier using ENERGY STAR 2008 minimum standards
Dehumidifier Replacement (ENERGY STAR 25.5–35.5 L/day)	552	934	Increased efficiency of efficient dehumidifier using ENERGY STAR 2008 minimum standards

Demand Savings

The specific end-use profiles used for each measure, peak period definitions used, recommended peak period coincidence factors (CFs), and the recommended kW as calculated with those coincidence factors are presented in Table 6. The evaluation team developed these factors in the course of our 2011/2012 and 2013 evaluations of the HAP. No additional changes were made in the 2014 evaluation.

Table 6. Specific Peak Period and End-Use Load Profiles by Measure

Measure Number	Measure	End-Use Profile	Peak Period	Peak Period Definition	Peak Period CF Value	Recommended kW
1	ENERGY STAR qualified CFL twister (60w)	Lighting	Summer - Non-weather sensitive	Standard	0.0000519463	0.0024
2	ENERGY STAR qualified CFL twister (75w)	Lighting	Summer - Non-weather sensitive	Standard	0.0000519463	0.0028

Measure Number	Measure	End-Use Profile	Peak Period	Peak Period Definition	Peak Period CF Value	Recommended kW
3	ENERGY STAR qualified CFL twister (100w)	Lighting	Summer - Non-weather sensitive	Standard	0.0000519463	0.0038
4	Block Heater Timer (just timer)	Car Block Heater	Summer - Non-weather sensitive	Standard	0	0.0000
5	Power Bar with integrated timer	Power Bar	Summer - Non-weather sensitive	Standard	0.0000444403	0.0024
6	Hot Water Tank Pipe Insulation - ½" (per cu foot) - Electric Water Heating Only	Residential Water Heat	Summer - Non-weather sensitive	Standard	0.0001212666	0.0046
7	Hot Water Tank Pipe Insulation - ¾" (per cu foot) - Electric Water Heating Only	Residential Water Heat	Summer - Non-weather sensitive	Standard	0.0001212666	0.0046
8	Hot Water Tank Insulation - Fiberglass R10 - Electric Water Heating Only	Residential Water Heat	Summer - Non-weather sensitive	Standard	0.0001212666	0.0327
9	Efficient Shower Head - Electric Water Heating Only	Residential Water Heat	Summer - Non-weather sensitive	Standard	0.0001212666	0.0457
10	Efficient Shower Head - Electric Water Heating Only	Residential Water Heat	Summer - Non-weather sensitive	Standard	0.0001212666	0.0457
11	Low-Flow Faucet Aerator (< 5.7 L/min) - Electric Water Heating Only	Residential Water Heat	Summer - Non-weather sensitive	Standard	0.0001212666	0.0170
12	Low-Flow Faucet Aerator (< 3.8 L/min) - Electric Water Heating Only	Residential Water Heat	Summer - Non-weather sensitive	Standard	0.0001212666	0.0097
13	Refrigerator replacement (ENERGY STAR qualified 15.5–16.9 cu feet)	Refrigerator	Summer - Non-weather sensitive	Standard	0.0001277190	0.0862
14	Refrigerator replacement (ENERGY STAR qualified 17.0–18.4 cu feet)	Refrigerator	Summer - Non-weather sensitive	Standard	0.0001277190	0.0862
15	Refrigerator Replacement (10.0–12.5 cu feet)	Refrigerator	Summer - Non-weather sensitive	Standard	0.0001277190	0.0862
16	Freezer replacement (ENERGY STAR qualified 12.0–14.4 cu feet)	Freezer	Summer - Non-weather sensitive	Standard	0.0001356416	0.0859
17	Freezer replacement (ENERGY STAR qualified 14.5–16.0 cu feet)	Freezer	Summer - Non-weather sensitive	Standard	0.0001356416	0.0859
18	Window air conditioner replacement (ENERGY STAR qualified 6,000–7,999 BTU/hr)	AC Room	Summer - Weather sensitive	Alternate	0.0010707343	0.1306
19	Window air conditioner replacement (ENERGY STAR qualified 8,000–9,999 BTU/hr)	AC Room	Summer - Weather sensitive	Alternate	0.0010707343	0.1649
20	Window air conditioner replacement (ENERGY STAR qualified 10,000–12,000 BTU/hr)	AC Room	Summer - Weather sensitive	Alternate	0.0010707343	0.2088

Measure Number	Measure	End-Use Profile	Peak Period	Peak Period Definition	Peak Period CF Value	Recommended kW
21	Dehumidifier replacement (ENERGY STAR qualified 14.2–21.2 L/day)	Dehumidifier	Summer - Non-weather sensitive	Standard	0.0003007831	0.1459
22	Dehumidifier replacement (ENERGY STAR qualified 21.3–25.4 L/day)	Dehumidifier	Summer - Non-weather sensitive	Standard	0.0003007831	0.1996
23	Dehumidifier replacement (ENERGY STAR qualified 25.5–35.5 L/day)	Dehumidifier	Summer - Non-weather sensitive	Standard	0.0003007831	0.2811
24	Programmable Thermostat – Baseboard	Space Heating Room	Summer - Weather sensitive	Alternate	0.0000013550	0.0001
25	Programmable Thermostat – Electric Furnace	Blended Furnace	Summer - Weather sensitive	Alternate	0.0003951689	0.0760
26	Comprehensive Draft-Proofing	Blended Furnace	Summer - Weather sensitive	Alternate	0.0003951689	kWh savings * 0.0004
27	Attic Insulation	Blended Furnace	Summer - Weather sensitive	Alternate	0.0003951689	kWh savings * 0.0004
28	Wall Insulation	Blended Furnace	Summer - Weather sensitive	Alternate	0.0003951689	kWh savings * 0.0004
29	Basement Insulation	Blended Furnace	Summer - Weather sensitive	Alternate	0.0003951689	kWh savings * 0.0004

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