



2015 Program Evaluation: Niagara-on-the Lake Conservation Cultivator Pilot

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Contents

- 1 Acronyms and Abbreviations.....2**

- 2 Executive Summary3**
 - 2.1 Program Description 3**
 - 2.2 Background, Goals, and Objectives 3**
 - 2.3 Key Observations and Recommendations..... 3**
 - 2.3.1 Impact Evaluation Observations and Recommendations 3
 - 2.3.2 Net-to-Gross Key Observations 4
 - 2.3.3 Process Evaluation 5

- 3 Evaluation Goals and Objectives7**

- 4 Program Description.....8**

- 5 Methodology.....9**
 - 5.1 Impact Evaluation Methodology..... 9**
 - 5.1.1 Project Reviews and Evaluation 9
 - 5.1.2 Net-to-Gross (NTG) Methodology 9
 - 5.2 Process Evaluation Methodology 10**
 - 5.2.1 LDC and Implementation Staff 11
 - 5.2.2 NOTLH Conservation Cultivator Participants..... 11

- 6 Participation12**

- 7 Impact Evaluation Results.....14**
 - 7.1 Energy and Summer Peak Demand Savings 14**
 - 7.2 Lifetime Savings 15**

7.3	Net-To-Gross (NTG)	15
7.3.1	Net-to-Gross Results	15
7.3.2	Free-Ridership	15
7.3.3	Spillover	16
7.4	Cost Effectiveness	16
8	Process Evaluation Results	18
8.1	LDC and Implementer Staff Perspectives	18
8.1.1	Roles and Responsibilities.....	18
8.1.2	Changes to the Pilot	18
8.1.3	Implementation Barriers.....	18
8.1.3.1	<i>NOTLH Staff</i>	18
8.1.3.2	<i>Implementation Staff</i>	19
8.1.4	Success of the Pilot to Date.....	20
8.1.5	Suggestions for Improvement	20
8.2	Participant Perspectives	20
8.2.1	Firmographics	20
8.2.2	Pilot Outreach and Marketing	20
8.2.3	Awareness of Other Save on Energy Business Programs.....	21
8.2.4	Participant Motives and Decision Making	21
8.2.5	Pilot Material and Application Satisfaction	21
8.2.6	Participant Satisfaction	22
8.2.7	Barriers to Future Participation	23
9	Key Observations and Recommendations	24
9.1	Impact Evaluation	24
9.2	Process Evaluation	25

1 Acronyms and Abbreviations

CDM	= Conservation and demand management
CFF	= Conservation first framework
EUL	= Effective useful life
FR	= Free ridership
kW	= Kilowatt
kWh	= Kilowatt-hour
IESO	= Independent Electricity System Operator
LDC	= Local distribution company
MAL	= Measures and assumptions list
M&V	= Measurement and verification
NOTLH	= Niagara-on-the-Lake Hydro, Inc.
NTG	= Net-to-gross
NTGR	= Net-to-gross ratio
PAC	= Program administrator cost
SO	= Spillover
TRC	= Total resource cost
TRM	= Technical reference manual

2 Executive Summary

2.1 Program Description

The Conservation Cultivator Pilot was designed and implemented by Niagara-on-the-Lake Hydro Inc. (NOTLH) and CLEAResult Canada Consulting Inc. The pilot was funded by the Independent Electricity System Operator (IESO) and was in market from January 2015 to May 2016.

The pilot targeted energy efficiency in greenhouses, fruit/vegetable facilities, and wineries, and provided prescriptive lighting and refrigeration upgrades as well as an opportunity for custom measures, under a direct install model.

2.2 Background, Goals, and Objectives

The Independent Electricity System Operator (IESO) retained Nexant, Inc. together with sub-consultant NMR Group to conduct an evaluation of its Business Programs for the 2017 evaluation cycle. This report provides the results of the impact and process evaluation of Niagara-on-the-Lake Hydro Inc. (NOTLH) Conservation Cultivator Pilot (or the "Pilot") for the 2015 program year.

The evaluation goals and objectives include:

- Verify energy and demand savings with a high degree of confidence, taking into account;
 - All measures implemented as part of the program
 - Spillover savings and pilot-enabled savings
- Review and evaluate key pilot elements;
- Conduct annual cost-effectiveness analyses; and
- Report and attribute savings due to the pilot.

2.3 Key Observations and Recommendations

This section provides a summary of the impact and process evaluation results, observations and recommendations for the NOTLH Conservation Cultivator Pilot.

2.3.1 Impact Evaluation Observations and Recommendations

The pilot reported savings from four projects. All four projects were included in the impact evaluation sample. Nexant reviewed all project documentation provided by IESO and NOTLH. Two projects were verified via desk review and two projects were verified with desk reviews and site visits.

The NOTLH Conservation Cultivator Pilot savings are summarized in Table 2-1 below.

Table 2-1: NOTLH Conservation Cultivator Pilot Savings Results

Savings Type	Gross Reported Savings	Realization Rate	Gross Verified Savings	Net To Gross Ratio	Net Verified Savings	Net Verified 2020 Savings
Energy (MWh)	187.7	48%	90.1	100%	90.1	90.1
Summer Peak Demand (MW)	0.0	-	0.012	100%	0.012	0.012

The following observations and recommendations are based on the four projects included in the pilot:

- Measures at two sites failed, leading to zero verified savings

Recommendation: *It may be beneficial for program administrators to consider performing follow up surveys with program participants and working closely with measure contractor to ensure measure persistence and customer satisfaction.*

- Summer peak demand savings were not reported for this pilot.

Recommendation: *It is recommended that future program implementers calculate and present summer peak demand savings using IESO's peak demand definition.*

- Reported savings were based on pre-project equipment run hours assumptions. Post-project run hours were verified to be different from these assumed run hours.

Recommendation: *It is recommended that future program implementers revise pre-project run hour assumptions with updated post-project run hours in saving calculations, if possible, in order to achieve more accurate savings estimates.*

2.3.2 Net-to-Gross Key Observations

The key net-to-gross observations from the pilot impact evaluation are as follows:

- Participant feedback indicates no free-ridership (0.0%), as responses show that the pilot helped customers' complete projects they would not have completed otherwise. Both participants learned about the pilot before they started planning the upgrades and indicated that they would have not known about or completed the upgrades if it had not been for the pilot. Both respondents said the availability of the pilot funding played a great role (5 rating) in their decision to make the energy-efficient upgrades, as did recommendations from a NOTLH representative and recommendations provided by auditors or contractors associated with the pilot.

Recommendation: Any future pilots or programs targeting this market should make sure to identify and target customers most in need of support, and who would not be able to install the equipment without the program.

2.3.3 Process Evaluation

The key observations and recommendations from the pilot process evaluation include the following:

- Both the implementer and NOTLH staff indicated that the customers in this market were hard to reach because they were very busy running their facilities, especially during the fall harvest. The implementer also mentioned that many customers may not have known what the next steps were after receiving their audit reports. These customers may have been too busy to take the time to understand the detailed audit report or to reach out to contractors.

Recommendation: Any future pilots or programs targeting this market should ensure that the auditors clearly describe next steps to customers after they receive their audit reports, connect customers with eligible contractors where possible, and reach out to customers during their off-season when they may be less busy (other than during the fall harvest).

- Both the implementer and NOTLH staff indicated that the contractor base did not have the expertise to perform the energy savings calculations required by the pilot, and therefore struggled to complete this requirement.

Recommendation: Any future pilots or programs targeting this market should ensure that there is a way for the participants to have the required energy savings calculations performed, whether it be through the implementer, an outside engineering firm specializing in these calculations, or by providing training to the contractor base so they can perform the calculations effectively.

- The pilot implementer stressed that any future programs that may be developed for this sector should consider offering more prescriptive non-lighting measures that are common across agricultural facilities as this could help customers and contractors better identify upgrade opportunities. This could also help more readily engage potential participants. Similarly, NOTLH staff indicated that if they were to do the pilot differently, they would have first begun with an assessment of several facilities to make sure the appropriate measures are included in the pilot offerings.

Recommendation: Any future pilots or programs targeting this market should first consider conducting assessments with several customers to ensure the appropriate measure mix is included in the pilot offerings.

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- Both participants reported that they first heard about the NOTLH Conservation Cultivator Pilot when a representative from NOTLH contacted them about the pilot offerings. One participant indicated that in-person events could help build confidence in the pilot and could help develop stronger relationships between customers and LDCs.

Recommendation: *Any future pilots or programs targeting this market should consider offering in-person events, such as “lunch and learns,” in addition to standard outreach approaches to help foster relationships, to develop trust, and to provide opportunities for LDC staff to answer questions in an informal setting.*

- Satisfaction with the pilot overall was high among both interviewed participants, as was satisfaction with the energy-efficient equipment and with the quality of the work done by the contractor who installed the equipment. However, both participants thought the contractor could have provided a clearer description of the work to be performed, any changes made to the scope of work, and any associated fees or costs.

Recommendation: *Any future pilots or programs targeting this market should work closely with contractors to ensure that all customer communications are provided in a clear and/or timely fashion, and that any fees associated with the equipment that are not covered by the pilot are provided upfront.*

3 Evaluation Goals and Objectives

The goals and objectives of the evaluation of NOTLH Conservation Cultivator Pilot are as follows:

- Verify energy and demand savings with a high degree of confidence, taking into account;
 - Measure-specific characteristics and data
 - Spillover savings and Pilot-enabled savings
- Review and evaluate key pilot elements;
- Conduct annual cost-effectiveness analyses; and
- Report and attribute savings due to the Pilot.

To estimate gross verified energy and summer peak-demand savings, the evaluation team conducted desk reviews of project documentation, followed by a telephone or on-site survey for each project in the pilot. To estimate the direct influence of the pilot in generating energy savings, the evaluation team conducted attribution surveys to calculate the rates of free ridership and spillover. This information was used to calculate a net-to-gross ratio, which was then applied to the gross verified savings to calculate the net savings.

4 Program Description

The Conservation Cultivator Pilot was designed and implemented by Niagara-on-the-Lake Hydro Inc. (NOTLH) and CLEAResult Canada Consulting Inc. The pilot was funded by the Independent Electricity System Operator (IESO) and was in market from January 2015 to May 2016.

The pilot targeted energy efficiency in greenhouses, fruit/vegetable facilities, and wineries. The pilot's business case stated that, according to previous Save on Energy application data, NOTLH's agricultural sector historically has had little participation in energy efficiency programs. Previously available energy efficiency programs were predominately cost-sharing programs that required significant capital investments from the participant. In order to overcome this barrier, the pilot therefore leveraged a direct-install model that provided full funding for the costs of targeted measures and custom measures. In addition to providing full funding for the measure, the program also provided no-cost and no-obligation assessments, which identified potential savings opportunities.

The program focused on providing refrigeration measures (up to \$15,000) and lighting measures (up to \$2,000), as these were believed to have the highest likelihood of uptake, have a proven track record of providing savings, and best lead to long-term market transformation. In addition to pre-approved refrigeration and lighting measures, the program also provided an incentive of up to \$15,000 for custom measures.

To reach potential participants, the program used a variety of outreach efforts, including:

- Direct mail sent to 99 agricultural accounts;
- In person visits at 30 accounts;
- Marketing through Ontario Ministry of Agriculture, Food, and Rural Affairs, which connected NOTLH with several farm accounts; and
- Third party sales, through notifying local equipment and service providers that install and service energy efficiency upgrades targeted by the program.

The documentation provided by NOTLH for each project in the pilot included program tracking database entries and project files. The program tracking database listed fields such as site contact information, reported savings, and incentive amount. Project documents included invoices, savings calculations, and a post-installation M&V report conducted by CLEAResult.

5 Methodology

The sections below describe the methodologies used to complete the impact and process-related components of the evaluation.

5.1 Impact Evaluation Methodology

5.1.1 Project Reviews and Evaluation

The pilot reported savings from four projects. This evaluation included all four projects into the impact evaluation sample.

The Nexant team reviewed all project documentation provided by IESO and NOTLH and attempted to conduct site visits at all four sites. Two customers were non-responsive to emails and phone calls, so their projects were verified via desk review. The remaining two projects were verified with desk reviews and site visits.

The desk reviews consisted of reviewing project documentation available in the pilot's database, such as pilot applications and verification reports. The site visits expanded upon the work conducted from the desk reviews by also including an on-site inspection of the measures, which involved verifying nameplate information, operating speed(s) and hours, and conducting an in-person interview with the site contact person.

Once the data had been collected, Nexant created hourly savings load shapes based on observed measure parameters. These load shapes were then used to derive verified annual energy savings and summer peak demand savings.

5.1.2 Net-to-Gross (NTG) Methodology

To calculate net savings, the team evaluated the portion of gross verified savings that is specifically attributable to the pilot. The evaluation team determined net savings by multiplying the gross verified savings by the net-to-gross (NTG) ratio, as shown in Equation 5-1.

Equation 5-1: Net Savings

$$Savings\ Net = Savings\ verified \times NTG$$

Where:

Savings net = Net savings impact (kW or kWh)

Savings verified = Gross verified energy savings (kW or kWh)

NTG = Net-to-gross ratio

To estimate the direct influence of the NOTLH Conservation Cultivator Pilot in generating net energy savings, the evaluation team implemented an attribution survey to calculate the free-ridership (FR) and spillover (SO) rates, assessed as percentages of total reported savings. Free-ridership is the program savings attributable to free riders (program participants who would have implemented a program measure or practice in the absence of the program). Spillover refers to additional reductions in energy consumption or demand that are due to program influences beyond those directly associated with program participation.¹ The NTG ratio is defined by Equation 5-2, where FR is the free-ridership percentage and SO is the spillover percentage:

Equation 5-2: Net-to-Gross Ratio

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

5.2 Process Evaluation Methodology

The process evaluation focused on the design, administration, and delivery of the NOTLH Conservation Cultivator Pilot. The evaluation team evaluated pilot processes through interviews with pertinent pilot actors, including LDC staff, the pilot implementer, and the participants (Table 5-1). The evaluation team could not complete interviews with the contractor or with two of the four pilot participants due to lack of responsiveness from these contacts.

For each population, the team developed a unique interview guide or survey to ensure responses produced comparable data and to allow the evaluation team to draw meaningful conclusions.

Table 5-1: Process Evaluation Primary Data Sources

Respondent Type	Methodology	Targeted	Completed
LDC Pilot Staff	Phone	1	1
Pilot Implementer	Phone	1	1
Contractor	Phone	1	0
Participants	Phone	4	2

¹ Free-ridership and spillover definitions are sourced from p.3 of Chapter 21: Estimating Net Savings – Common Practices of the Uniform Methods Project. Web: www.nrel.gov/docs/fy17osti/68578.pdf.

5.2.1 LDC and Implementation Staff

The evaluation team completed a telephone interview with NOTLH staff in February of 2018. Topics covered during the pilot staff interview included staff roles, any changes to the pilot's design or implementation during the time it was active, supply channel engagement, barriers to implementation, and staff perspectives on the success of the pilot.

The evaluation team also completed a telephone interview with the pilot implementer in March of 2018. Topics covered included any changes to the pilot's design or implementation during the time it was active, supply channel engagement, barriers to implementation, and staff perspectives on the success of the pilot.

The purpose of the interview was to better understand how the pilot was designed, administered, and delivered. The evaluation team identified the appropriate staff to be interviewed in consultation with the IESO staff. These interviews helped inform the questions asked of the participants during telephone interviews.

5.2.2 NOTLH Conservation Cultivator Participants

In April of 2018, the evaluation team completed two telephone interviews with pilot participants. Interviews could not be completed with the two other pilot participants due to unresponsiveness. The purpose of these interviews was to better understand participant perspectives related to pilot delivery. The survey addressed how participants learned about the pilot, motivations for having the project done, satisfaction with various aspects of the pilot process, participant intent to complete the upgrade in the absence of the pilot, and whether respondents undertook energy efficient projects without pilot incentives.

6 Participation

The pilot reported savings for four projects. The facilities involved in the pilot were a cold storage, farm, and two greenhouses. All four projects involved refrigeration fan motor upgrades and one site additionally included a screw-in style LED lighting upgrade.

Four projects were completed and reported 187,700 kWh in annual electricity savings. The projects included the following measures:

- Refrigeration control systems
- Electronically commutated motors (ECMs)
- LED light bulbs

The pilot reported an additional 86,688 kWh annual savings by attracting contractors and participants through the pilot and passing them along to the Retrofit program. These projects were later provided an incentive by the Retrofit program and, therefore, these savings are included in the Retrofit program's verified savings and not in the pilot's verified savings.

Table 6-1 shows a summary by facility type and

Table 6-2 shows specific NOTLH Conservation Cultivator Pilot projects. Targeted measures were defined by the pilot's business case as refrigeration; specifically room cooling and packaged chillers, and lighting. Non-targeted measures were considered custom.

Table 6-1: Count of Projects

Facility Type	Sites Enrolled
Farm/Vegetable Farm	2
Greenhouse	2
Total	4

Table 6-2: Project Measure Type and Savings

Project #	Facility Type	Measure Type	Gross Reported Annual kWh Savings
1	Greenhouse	Custom Measure	40,500
2	Greenhouse	Custom Measure	37,400
		Targeted Measure	23,300
3	Farm	Custom Measure	33,200
4	Farm	Custom Measure	53,300
Total			187,700

7 Impact Evaluation Results

The sections below describe the impact evaluation results.

7.1 Energy and Summer Peak Demand Savings

Savings are summarized in Table 7-1 by project and overall pilot level. ECM controller measures at 2 of the 4 participants (Project 2 and 4) failed shortly after installation. The reason for measure failure at both projects could not be verified due to lack of response from the participant in Project 2 and installation contractor in Project 4.

Table 7-1: Pilot Level Savings Results

Savings Type	Project #	Gross Reported Savings	Realization Rate	Gross Verified Savings	Net To Gross Ratio	Net Verified Savings	Net Verified 2020 Savings
Energy (MWh)	1	40.5	102%	41.4	100%	41.4	41.4
	2	60.7	38%	23.3	100%	23.3	23.3
	3	33.2	78%	25.8	100%	25.8	25.8
	4	53.3	0%	0	100%	0	0
	Total	187.7	48%	90.1	100%	90.1	90.1
Peak Demand (MW)	1	-	-	0.005	100%	0.005	0.005
	2	-	-	0.004	100%	0.004	0.004
	3	-	-	0.002	100%	0.002	0.002
	4	-	-	0.000	100%	0.000	0.000
	Total	0	0	0.012	100%	0.012	0.012

Measure failure at 2 projects leading to zero realization rates decreased the overall program realization rate significantly. In implementing similar pilots in the future, it may be beneficial for program administrators to consider performing follow up surveys with program participants and working closely with measure contractors to ensure measure persistence and customer satisfaction.

Summer peak demand savings estimates were not included in the program tracking database and, therefore, no summer peak demand realization rate was calculated. Nonetheless, the evaluation team calculated verified summer peak demand savings for each project in the program. It is recommended that future program implementers calculate and present summer peak demand savings using IESO's peak demand definition.

7.2 Lifetime Savings

All projects involved the installation of more efficient motors and/or control adjustments, which have a 15 year effective useful life in the IESO Measures and Assumptions List¹. One project also involved a lighting retrofit which has an 11 year effective useful life. Therefore, savings for the entire pilot, which had all its measures implemented in 2015, are expected to persist through the year 2025 and the net 2020 annual savings is expected to be identical to the net verified first year savings.

7.3 Net-To-Gross (NTG)

NTG observations for the NOTLH Conservation Cultivator Pilot are presented in the following subsections. This information was collected as part of the participant survey.

7.3.1 Net-to-Gross Results

There were two responses received for the net-to-gross (NTG) survey. The results from these surveys are presented in Table 7-2.

Table 7-2: Net-to-Gross Survey Results

NTG Assignment	Sample size	Savings Weighted FR*	Energy SO*	Demand SO*	Energy Savings Weighted NTG *%	Demand Savings Weighted NTG* %	Energy Relative Precision at 90% Confidence Level	Demand Relative Precision at 90% Confidence Level
Province-wide	2	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%

*Note: FR: Free-ridership; SO: Spillover; NTG: Net-to-Gross

7.3.2 Free-Ridership

The evaluation team assessed the extent of free-ridership within the pilot by asking respondents a series of questions about when they learned about the pilot, what they would have done in the absence of the pilot, and how influential the pilot was on the participant's decision to do the energy-efficient upgrades. Please note that the questions regarding participants' intention in the absence of the program, as well as the question regarding the program's influence on respondent decision-making, are both used to estimate free-ridership.

The evaluation team asked survey respondents when they first learned about the incentives offered by the NOTLH Conservation Cultivator Pilot and what they would have done if they had never learned they could receive upgrades from NOTLH. Both respondents learned about the pilot before they started planning the upgrades and stated they would not have completed the

¹ IESO Prescriptive Measures and Assumptions List, October 2015, <http://www.ieso.ca/-/media/files/ieso/document-library/conservation/measures-and-assumptions/ieso-prescriptive-measures-assumptions-list-october-2015.pdf?la=en>

upgrades if they had not learned about the pilot funding, which is suggestive of low free-ridership levels.

The evaluation team asked respondents how much of a role specific factors associated with the pilot played in their decision to do the upgrades. They responded using a scale of 1 to 5, where 1 means “the factor played no role at all” and 5 means “the factor played a great role” in the respondent’s decision to do the energy-efficient upgrade. Both respondents said the following factors played a great role (5 rating) in their decision-making:

- Availability of the pilot funding
- Recommendations from a NOTLH representative
- Information or recommendations provided by auditors or contractors associated with the pilot

Energy assessments and marketing materials from the LDC played little to no role as respondents reported they were unaware of or did not recall receiving results of energy assessments or marketing materials. This suggests that direct interactions from representatives were likely the primary way that participants were engaged by the pilot.

In summary, overall pilot free-ridership was very low (0.0%) given that both respondents would not have completed the upgrades without the pilot and given that at least some of the pilot’s features were influential on the respondents’ decision-making

7.3.3 Spillover

The participant survey did not find evidence of spillover. To assess this, respondents were asked whether they had installed or upgraded any energy-efficient equipment after participating in the program and for which they did not receive an incentive from their utility or other outside organization. Both respondents said they had not completed any such installations or upgrades.

7.4 Cost Effectiveness

The evaluation team conducted a cost effectiveness analysis for the pilot. This analysis was completed in accordance with the IESO requirements as set forth in the IESO *CDM Cost Effectiveness Test Guide* and using IESO’s *CDM Energy Efficiency Cost Effectiveness Tool*². The energy and demand savings results from the impact evaluation were inputs into the IESO *Cost Effectiveness Tool* as well as budget information supplied from IESO. Cost effectiveness results are presented in Table 7-3. The pilot did not pass the Total Resource Cost (TRC) test or

² *Conservation & Demand Management Energy Efficiency Cost Effectiveness Guide*, Independent Electricity System Operator, March 2015, <http://www.ieso.ca/-/media/files/ieso/document-library/conservation/lcd-toolkit/cdm-ee-cost-effectiveness-test-guide-v2-20150326.pdf?la=en>

the Program Administrator Cost (PAC) test, with both ratios having benefits lower than their respective costs.

A primary driver for the low benefit/cost ratios was the relatively high reported program administrative cost for the program. Another driver of the low benefit/cost ratios was the incentivized equipment that failed, which incurred program costs while not producing verified savings.

Table 7-3: Cost Effectiveness Results

Cost Effectiveness Test	Value
Total Resource Cost (TRC)	
TRC Costs (\$)	265,152
TRC Benefits (\$)	68,568
TRC Net Benefits (\$)	-196,585
TRC Net Benefit (Ratio)	0.26
Program Administrator Cost (PAC)	
PAC Costs (\$)	265,152
PAC Benefits (\$)	59,624
PAC Net Benefits (\$)	-205,528
PAC Net Benefit (Ratio)	0.22
Levelized Unit Energy Cost (LUEC)	
\$/kWh	0.29
\$/kW	2,242.71

8 Process Evaluation Results

The sections below describe the process evaluation results. The purpose of the process evaluation is to provide insights in regard to program design, delivery, participant motivations to participate, satisfaction, barriers, and suggestions for program improvement. Pilot processes were evaluated through interviews with pertinent pilot actors, including NOTLH staff, implementation staff, and participants.

8.1 LDC and Implementer Staff Perspectives

8.1.1 Roles and Responsibilities

The NOTLH staff oversaw the implementation of the pilot. They promoted the pilot to customers, helped connect the customers with contractors if they did not already have a contractor, and managed the relationship with the implementer. The implementer was responsible for designing the pilot, reviewing applications, helping to generate leads, and coordinating with the NOTLH staff and the contractors.

8.1.2 Changes to the Pilot

Both the NOTLH staff and the implementer indicated that after the pilot was active for several months with low participation, NOTLH and the implementer decided to offer free assessments (or audits) to customers who were interested in participating in the pilot to help with recruitment and to ensure that all eligible upgrade opportunities were identified. The implementer noted that these assessments helped them better identify upgrade opportunities and generated some additional interest, but a lot of the customers ultimately did not know what to do with the audit report or did not have time to follow up with contractors about making the recommended upgrades.

8.1.3 Implementation Barriers

8.1.3.1 NOTLH Staff

NOTLH staff reported several barriers to pilot implementation. Staff said that there was a lot of initial interest from customers about the pilot, but that it was difficult to convert them into participants as these customers were busy running their businesses. NOTLH staff also said that they had interest from many smaller companies, but these customers did not have the equipment to qualify for the pilot.

The pilot was intended to focus on refrigeration, process, and storage measures for greenhouses, farms, and wineries. These measures were selected based on sector reports gathered by the implementer. As mentioned above, after a period of time, the pilot staff and implementer decided to institute an assessment component where the implementer visited several interested facilities to identify appropriate measures and generate more leads. Once the

assessments began, NOTLH staff said they quickly realized that the pilot was too strict on what was considered qualifying equipment as the savings opportunities found were minimal for many facilities. They noted that many of the smaller farmers only refrigerate for a few months in the summer, so total annual savings were not large enough for the pilot to cover the costs.

NOTLH staff said that quantifying the savings associated with the measures identified at customers' facilities was more difficult than anticipated for the contractors. Many of these contractors were willing to do the installation, but not the required savings calculations. Their unwillingness may have been due to lack of expertise or training with doing these detailed calculations. Additionally, there was no guarantee that the contractor would win the job even if they completed the energy savings calculations for the customer.

Moreover, NOTLH staff also reported that there was only one contractor that was willing and able to complete projects and do the savings calculations that were required. This contractor was located outside the pilot area, which meant they were not able to spend as much time on the ground generating leads. The evaluation team reached out to this contractor for an interview to learn more about their experiences, but the contractor was unresponsive to the interview requests.

8.1.3.2 Implementation Staff

The implementation staff thought that the two primary barriers to the pilot were (1) the time constraints of the customers and (2) the lack of expertise amongst the existing contractor base regarding the required energy savings calculations. The implementation staff thought that the customers needed a technical consulting firm that would have been able to do the necessary savings calculations to estimate savings and cost-effectiveness.

The implementer stressed that this market proved challenging to penetrate, indicating that the incentive rates, even though they were relatively high, did not seem to be a significant driver of customer participation. Both the contractors and customers were very busy; many local contractors were occupied with the service and maintenance of existing facilities and many customers were focused on running their facilities. The implementer found that both the customers and contractors in this market are unlikely to proactively identify new savings opportunities when repairing existing equipment or installing new equipment. Building a culture where these customers and contractors consider energy efficiency remains a significant challenge and opportunity for this market.

The implementer also said that it seemed very difficult for new contractors to enter the market because many customers already had existing contractor relationships. They also indicated (as the NOTLH staff had) that one contractor from outside the region was willing and able to conduct the energy savings calculations for several potential participants, and did install equipment for a handful of customers, but that this firm may have experienced similar challenges with the detailed energy savings calculations.

8.1.4 Success of the Pilot to Date

NOTLH staff asserted that they were not satisfied with the results of the pilot overall given the savings achieved and the barriers mentioned above. The implementation staff thought that the pilot was successful in the sense that it was one of the first pilots that tried to address non-lighting measures in this sector and noted that there remains significant untapped savings potential in the agricultural sector.

8.1.5 Suggestions for Improvement

NOTLH staff stressed that the initial projections about the savings opportunities and the measures that were common to the sector were not accurate. If they were to do it differently, they would recommend breaking the pilot into two phases. In the first phase, pilot-funded assessments would be conducted at several different facilities to determine common equipment types that occur in their specific region. This information could then be used to determine which measures to include within the pilot's set of offerings. The second phase could involve marketing the pilot and these specific offerings to all eligible customers.

Additionally, NOTLH staff said that if they were to do it differently, they would have requested that the implementer be more involved in or took charge of the energy savings calculations. This would give the implementer more firsthand experience with the customers and allow them to adjust to the pilot more quickly if needed.

The implementer stressed that any future programs in this sector should consider offering more prescriptive non-lighting measures that are common within the region where the program is offered. Having more of these measures identified from the start could help any future programs identify upgrade opportunities more efficiently and more easily engage potential customers.

8.2 Participant Perspectives

The evaluation team completed two telephone interviews with NOTLH Conservation Cultivator pilot participants to better understand participant perspectives related to pilot delivery. Feedback from these interviews is summarized below.

8.2.1 Firmographics

The evaluation team asked respondents about their position in the company, ownership status, primary activity, and chain or franchise status. Both respondents were owners/presidents and had primary responsibility in the decision-making process to implement the upgrades or retrofits at their company. Both companies are independent businesses in the agricultural sector.

8.2.2 Pilot Outreach and Marketing

Both survey respondents reported they first heard about the NOTLH Conservation Cultivator Pilot when a representative from NOTLH contacted them about the pilot offerings.

8.2.3 Awareness of Other Save on Energy Business Programs

The evaluation team asked respondents about their awareness of other Save on Energy Business Programs. Only one respondent knew about the Retrofit Program. Neither respondent was aware of the Audit Funding Program or any other programs.

8.2.4 Participant Motives and Decision Making

The evaluation team asked respondents to rate the importance that various factors *not directly related to the pilot* had on their decision to participate in the NOTLH Conservation Cultivator Pilot. They responded using a scale of 1 to 5, where 1 means “it played no role at all” and 5 means “it played a great role” in the respondent’s decision to do the energy efficiency upgrade. Both respondents stated that the following factors played a great role (5 rating) in their decision to participate:

- Ease of participation
- Reliability of the equipment incentivized by NOTLH
- Savings in energy consumed or on bills
- Association with “green” or “sustainable” actions

Both respondents indicated that increasing comfort and/or productivity was not applicable or did not know about its role in their decision to do the project, which suggests this may be a less important driver for participation in this sector.

The evaluation team asked the respondents if their organization had a policy related to energy efficiency or sustainability. One respondent reported having an unofficial commitment to energy efficient or sustainable practices with no specific savings targets or time period identified in which to meet those targets. This policy was, in part, a motivator for this respondent to do the energy efficiency upgrade. The other respondent did not have a policy.

The evaluation team asked respondents how they made their selection of the equipment they installed or upgraded through the pilot. Both respondents selected their incentivized equipment based on suggestions provided by their contractor.

8.2.5 Pilot Material and Application Satisfaction

The evaluation team asked respondents to rate the sufficiency and clarity of pilot-related materials provided by NOTLH, as well as the ease of the pilot screening process. Respondents provided this rating using a scale of 1 to 5, where 1 means “do not agree at all” and 5 means “completely agree” that the pilot materials were sufficient and clear, or that the screening process was easy to complete. One respondent completely agreed (5 rating) that the screening process was easy to complete, but did not know about the sufficiency or clarity of pilot-related materials. The other respondent did not know about the screening process and did not remember receiving pilot-related materials.

8.2.6 Participant Satisfaction

The evaluation team asked respondents to rate their satisfaction with the pilot on a scale of 1 to 5, where 1 means "not at all satisfied" and 5 means "completely satisfied" with the pilot. Both respondents indicated they were satisfied (4 rating) with the pilot overall.

When asked about satisfaction with the energy efficient equipment offered through the pilot, both respondents indicated they were completely satisfied (5 rating) with the performance of the equipment. Only one respondent was completely satisfied with the energy savings achieved from the equipment. The other respondent indicated their savings were less than satisfactory (2 rating). This same respondent indicated they were not sure if they had experienced any associated savings in their energy bills but noted that it is difficult for them to be sure without more closely monitoring or individually metering the equipment. Respondents reported they were satisfied or very satisfied (4 or 5 rating) with the quality of work done by the contractor who installed the equipment. One respondent indicated they were completely satisfied (5 rating) with their interactions with representatives from NOTLH, while the other was neutral (3 rating). This same respondent felt the contractor was too forceful in encouraging them to consider additional upgrades beyond those covered by the pilot.

Neither respondent remembered receiving any technical studies or reports related to the pilot and thus could not rate their satisfaction with them.

When asked how likely they were to recommend the pilot to others, one respondent indicated they were likely to recommend (4 rating) the pilot to others while the other was neutral (3 rating).

Respondents suggested the following ways to improve the pilot if it were to continue in the future:

- Require pilot contractor to provide a clear description of the work to be performed and follow up with updates to any changes in the work plan. Both respondents felt that they were not sufficiently informed when the contractor made changes to the equipment or the work plan.
- Require pilot contractor to provide participants with an upfront description of fees associated with the equipment not covered by the pilot.
- Expand the pilot to a larger scale and increase the amount of the incentive.
- Provide educational opportunities. For example, through business sector-specific group meetings, the pilot could teach customers about eligible upgrades and provide them with the opportunity to ask the NOTLH staff questions.
- One respondent stated, "we get inundated by calls and e-mails from companies trying to sell us their products. In-person events could help build confidence and develop stronger relationships between customers and LDCs. Since we have gotten to know the NOTLH

staff, we have begun to talk more about future upgrades.”

8.2.7 Barriers to Future Participation

The evaluation team asked respondents to rate their level of agreement with reasons why it could be difficult for their business to make future energy efficient upgrades. The interviewers asked respondents to provide their feedback using a scale of 1 to 5, where 1 means the barriers was “not at all relevant” and 5 means the barrier was “completely relevant” to their ability to make future energy-efficient upgrades.

The interviewer asked each respondent whether it would be difficult for them to make future upgrades because the benefits of the energy savings might not outweigh the costs of those upgrades. One respondent said that this might be a reason they would not make future upgrades (4 rating), and the other respondent thought this issue would not be an issue if they were to make future upgrades (1 rating). Similarly, one respondent said it would be likely that his company could not afford to make any further upgrades at his facility (4 rating), and the other said that being able to afford future upgrades would likely not be a major barrier to doing so (1 rating).

Respondents indicated that not having the time to conduct research for equipment upgrades (3 and 5 ratings) and not knowing where to access help when needed (3 and 4 ratings) were other reasons why it could be difficult for their businesses to make future energy-efficient upgrades. Both respondents said the electric bill would play a role in influencing any decisions they might make for future upgrades. Both businesses owned their equipment, ensuring leased equipment would not have an impact on whether they could make future upgrades.

9 Key Observations and Recommendations

The sections below describe the key observations and recommendations from the evaluation of the NOTLH pilot.

9.1 Impact Evaluation

Below are the key observations and recommendations from the pilot program's impact evaluation:

- Measures at two sites failed, leading to zero verified savings

Recommendation: *It may be beneficial for program administrators to consider performing follow up surveys with program participants and working closely with measure contractors to ensure measure persistence and customer satisfaction.*

- Summer peak demand savings were not reported for this pilot.

Recommendation: *It is recommended that future program implementers calculate and present peak demand savings using IESO's peak demand definition.*

- Reported savings were based on pre-project equipment run hours assumptions. Post-project run hours were verified to be different from these assumed run hours.

Recommendation: *It is recommended that future program implementers revise pre-project run hour assumptions with updated post-project run hours in saving calculations, if possible, in order to achieve more accurate savings estimates.*

The key net-to-gross observations from the pilot impact evaluation are as follows:

- Participant feedback indicates no free-ridership (0.0%), as responses show that the pilot helped customers' complete projects they would not have completed otherwise. Both participants learned about the pilot before they started planning the upgrades and indicated that they would have not known about or completed the upgrades if it had not been for the pilot. Both respondents said the availability of the pilot funding played a great role (5 rating) in their decision to make the energy efficient upgrades, as did recommendations from a NOTLH representative and recommendations provided by auditors or contractors associated with the pilot.

Recommendation: Any future pilots or programs targeting this market should continue to identify and target customers most in need of support, and who would not be able to install the equipment without the program.

9.2 Process Evaluation

The key observations and recommendations from the pilot process evaluation include the following:

- Both the implementer and NOTLH staff indicated that the customers in this market were hard to reach because they were very busy running their facilities, especially during the fall harvest. The implementer also mentioned that many customers may not have known what the next steps were after receiving their audit reports. These customers may have been too busy to take the time to understand the detailed audit report or to reach out to contractors to schedule the work.

Recommendation: Any future pilots or programs targeting this market should ensure that the auditors clearly describe next steps to customers after they receive their audit reports connect customers with eligible contractors where possible and reach out to customers during their off-season, when they may be less busy (other than during the fall harvest).

- Both the implementer and NOTLH staff indicated that the contractor base did not have the expertise to perform the energy savings calculations required by the pilot, and therefore struggled to complete this requirement.

Recommendation: Any future pilots or programs targeting this market should ensure that there is a way for the participants to have the required energy savings calculations performed, whether it be through the implementer, an outside engineering firm specializing in these calculations, or by providing training to the contractor base so they can perform the calculations effectively.

- The pilot implementer stressed that any future programs that may be developed for this sector should consider offering more prescriptive non-lighting measures that are common across agricultural facilities as this could help customers and contractors better identify upgrade opportunities. This could also help more readily engage potential participants. Similarly, NOTLH staff indicated that if they were to do the pilot differently, they would have first begun with an assessment of several facilities to make sure the appropriate measures are included in the pilot offerings.

Recommendation: Any future pilots or programs targeting this market should first consider conducting assessments with several customers to ensure the appropriate measure mix is included in the pilot offerings.

- Both participants reported that they first heard about the NOTLH Conservation Cultivator Pilot when a representative from NOTLH contacted them about the pilot offerings. One participant indicated that in-person events could help build confidence in the pilot and could help develop stronger relationships between customers and LDCs.

Recommendation: Any future pilots targeting this market should consider offering in-person events, such as “lunch and learns,” in addition to standard outreach approaches to help foster relationships, to develop trust, and to provide opportunities for LDC staff to answer questions in an informal setting.

- Satisfaction with the pilot overall was high among both interviewed participants, as was satisfaction with the energy efficient equipment and with the quality of the work done by the contractor who installed the equipment. However, both participants thought the contractor could have provided a clearer description of the work to be performed, any changes made to the scope of work, and any associated fees or costs.

Recommendation: Any future pilots or programs targeting this market should work closely with contractors to ensure that all customer communications are provided in a clear and/or timely fashion, and that any fees associated with the equipment that are not covered by the pilot are provided upfront.



Nexant Canada, Inc.
TD Canada Trust Tower
161 Bay Street, 27th Floor
M5J 2S1 Toronto
Canada
www.nexant.com