**takeCHARGE Process and Market Evaluation**

DNV·GL

# *takeCHARGE* Process and Market Evaluation Final Report

## Newfoundland Power and Newfoundland Labrador Hydro

**Prepared by KEMA Consulting Canada, Ltd.**
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# Table of Contents

# List of Exhibits

# EXECUTIVE SUMMARY

## Introduction

Newfoundland Power and Newfoundland Labrador Hydro (Hydro) began offering joint energy efficiency programs to their residential customers in 2009. The *takeCHARGE* programs were a suite of programs offered by Newfoundland Power and Hydro (the Utilities). The *takeCHARGE* programs include the following:

- Insulation Rebate Program – provides rebates for insulating basement walls, basement ceilings and attic and crawl spaces
- Thermostat Rebate Program – offers rebates for programmable and electronic thermostats with a temperature rating of +/- 0.5 degrees Celsius
- ENERGY STAR Windows Rebate Program – provides rebates for purchasing and installing ENERGY STAR certified windows.

The *takeCHARGE* programs are offered to homeowners with electric space heat or a supplemental heating system whose annual electricity usage equals or exceeds 15,000 kWh. Furthermore, the customers' home must be their primary residence and be a detached, semi-detached or mobile/modular home on a permanent foundation.

In November 2013, the Utilities selected DNV GL to conduct a process and market evaluation of the *takeCHARGE* programs. The primary objectives included:

- Provide an assessment of the effectiveness of program delivery from the customer and program partners' perspectives
- Gain an understanding of barriers to program success and operational effectiveness
- Provide an in-depth examination of the adoption rates and motivations for installing the technologies offered by the programs for both program participants and non-participants.
- Determine the current and remaining effectiveness of these programs as market intervention strategies, and program performance characteristics that should be considered when the Utilities develop a strategy for retiring the *takeCHARGE* programs.

The evaluation period for the study was 2009 through 2012. Given that the *takeCHARGE* programs have been fully implemented and actively marketed to customers, retailers and contractors, the Utilities keen interest in this study was to focus on the market characterization aspects of the study. Therefore, the study included a detailed analysis of the market baseline practices, program attribution and remaining market potential for each program.

## Evaluation Objectives

The primary focus of the process evaluation was to provide an assessment of the effectiveness of program delivery from the customer and program partners' perspectives, and an understanding of barriers to program success and operational effectiveness. The market evaluation provided an in-depth examination of the adoption rates and motivations for installing the technologies offered by the programs for both program participants and non-participants. Table E-1 shows the key objectives for each evaluation.

**Table E-1: Process and Market Evaluation Objectives**

| Process and Market Evaluation Objectives |
|---|
| **Process Evaluation Objectives** |
| • Assist with the development of exit strategies for the three residential *takeCHARGE* programs including determining major factors and market penetration levels for consideration for exit strategy development. |
| • Determine barriers that limit program performance and attitudes toward programs for retailers, contractors, builders and non-participants. |
| • Review each program partners' processes and level of engagement for opportunities for improvement in the three residential programs. |
| • Recommend the best practice approaches for conducting an impact evaluation for the ENERGY STAR windows, programmable thermostats and basement and attic insulation programs. |
| **Market Evaluation Objectives** |
| • Estimate the total sales of ENERGY STAR windows and programmable thermostats in Avalon, Rest of Island and Labrador during the evaluation period of 2009-2012 and expected future market trends. |
| • Estimate the baseline shares of various window, thermostats and insulation technologies, using the results of vendor surveys. |
| • Estimate the upper and lower bounds of the portion of those market shares that could be attributed to the programs. |
| • Confirm installation (actual compliance level) and free ridership level in each of the three residential programs. |
| • Determine rate or estimated quantity technology adoption of ENERGY STAR windows, programmable thermostats and basement insulation "outside the program" that could be attributed to effects of the program (spill over). |
| • Identify factors that are driving or inhibiting the promotion and uptake of efficient products in the relevant technologies. |

Based on the findings of the two components of the evaluation, recommendations were provided regarding an appropriate exit strategy for the programs. In addition, the results of this study were used to recommend the best practice approaches for conducting an impact evaluation for the ENERGY STAR windows, programmable thermostats and basement and attic insulation programs. Table E-2 summarizes the data collection activities that were undertaken to perform the study.

**Table E-2: Data Collection Plan for Process and Market Evaluations**

| Target Group | Population | Sample Size | In-Depth Interviews | Quantitative Surveys |
|---|---|---|---|---|
| Utility Staff | | | | |
| Newfoundland Power and Hydro Program Staff | 24 individuals who design, implement and evaluate the programs | 6 Total | X | |
| Contractors & Builders | | | | |
| Insulation contractors | Participating and non-participating builders and contractors in the sectors targeted by the programs | 14 Participating<br>10 Non-Participating | x | x |
| Thermostat vendors and installers | | | | |
| Window contractors | | | | |
| Builders | | | | |
| Customers | | | | |
| Program Participants - in one or more *takeCHARGE* programs | Newfoundland Power = 4,851<br>Hydro = 156 | 151 | | X |
| Non-participants - who qualify are eligible for the *takeCHARGE* programs | Sample developed using NP and Hydro customer billing data | 212 | | X |
| Retailers and Manufacturers | | | | |
| Participating Retailers/Manufacturers | Actively Engaged Retailers - big box and smaller retailers | 32 | | X |
| Non-participating | Retailers | 5 | | X |

# Summary of Key Findings

## Process Evaluation Findings

Overall, all three of the *takeCHARGE* programs were operating smoothly from the perspective of the program staff and retailer and vendors. Interviews with staff and vendors identified several key success factors for the program:

- The suite of *takeCHARGE* programs was cost effective and either met or exceeded all of its participation and savings goals in 2012.
- Many participants were repeat participants either within the same program or across programs.
- The turnaround time in processing rebates was short. This was corroborated by participants indicating a high level of satisfaction in the timeliness of their rebates, with 83% to 88% of participants either satisfied or very satisfied.
- Program staff recognized the critical role that retailers have in the programs. They used multiple recruiting and support mechanisms to solicit their involvement in the programs including, in store demonstrations, partnering on rebates, etc.
- Retailers and program staff both indicated that spiffs (i.e., a bonus or other compensation given to retail salespeople for promoting the products of a particular manufacturer) on products, particularly ENERGY STAR windows were very successful.

Both vendors and program staff identified several challenges and barriers to be addressed:

- The paper rebate forms for all programs were cumbersome and confusing. The program staff is in the process of offering a streamlined on-line version of the rebate form to customers. Program staff also actively encourages retailers to help customers to complete the form. However, some retailers found it difficult to fill out for customers.
- Some retailers stated that they were still confused about what the qualifications requirements for the measures and suggested more one-on-one interaction with program staff.

- The marketing and outreach efforts were broad and did not target specific geographies or customer types. Tailoring materials to specific customer segments such as rural customers or customers residing in older homes would further improve program penetration.

## Customer Survey Findings

Overall, participating customers had very positive responses to nearly all aspects of the program. Awareness of the *takeCHARGE* programs and the offerings was high among non-participants. The key findings included:

- The demographic differences between participants and non-participants were not significant. However, non-participants typically had smaller single family homes, less than 1,000 square feet compared to participants.
- Nearly 50% of participants cited saving energy as the primary motivation for participating. For customers who stated they participated in the program because the existing measure failed, 59% of window participants indicated that as the primary reason for participating.
- Non-participants provided a wide range of reasons for not participating, such as personal preference, equipment did not qualify, etc., with no one response accounting for the majority.
- Knowing the amount of the insulation rebate before participating was an important program design feature to both participants (73%) and non-participants (63%).
- Overall, participants were very satisfied across all programs, ranging from 76% to 93%.
- Participants were generally happy with the rebate amounts; however 10% of insulation participants were either dissatisfied or very dissatisfied with their rebates.
- Participants were very satisfied with their retailers, 55% to 64% but participants said that retailers had a minimal influence on the type of equipment selected by the participant particularly for thermostats.

## Program Partners

### Contractors

The contractors interviewed for this study worked predominately in the new construction market. Given the construction boom in Newfoundland and Labrador, this was not surprising. Since having to comply with the new building code, the contractors stated that measures offered by the *takeCHARGE* programs were already incorporated into their standard design offerings. The contractors did provide some feedback and recommendations regarding the program marketing:

- Participating contractors particularly appreciate the opportunity of having a contact person at the utility to answer all their inquiries and support them with the programs' application.
- Add stickers to identify the program (similar to ENERGY STAR stickers for windows)
- Advertise in movie theatres citing the province's high movie attendance
- Include program materials when building approvals are issued

Perhaps the key finding from the contractor interviews was their perception and use of the program rebates. Overall, contractors in general have not expressed any particular need in promoting the programs' measures to their clients. Most contractors promoted the use of energy efficient features in their work without mentioning the *takeCHARGE* programs to their clients (unless the customer asks). Contractors often used energy efficiency as a selling point but did not mention the program to their customers to avoid customers ask for a lower selling price on the house or for concerns that the customer may apply for the rebates directly. Furthermore, the contractors and builders who included energy efficiency as part of their standard offerings viewed the *takeCHARGE* programs as an easy way to recover some of their investments in energy efficiency features that they would have made without the

program. While the *takeCHARGE* programs are no longer offered to new construction customers due to the new building codes, contractors who include the energy efficiency options as their standard offerings for retrofit and remodelling projects are free riders.

Both participating and non-participating contractors expect the adoption of energy efficiency measures to continue in the future. Contractors identified a number of energy efficient products that will gain markets share in the coming years:

- Insulation - both attic and basement, with an increasing use of insulated concrete foams (ICFs) and blown-in insulation
- Future home automation - smart thermostats
- ENERGY STAR windows
- Heat recovery ventilators (HRV)
- On-demand hot water systems.

### Retailers

In general, retailers were very satisfied, 90%, with the *takeCHARGE* programs but did offer several suggestions:

- Do more marketing / promotion of the program. A few retailers specifically asked for more in-store events.
- Increase or widen available customer incentives. Retailers offered a variety of responses within this topic; some simply wanted customers to get a larger incentive for an energy efficiency measure purchase and installation; other respondents wanted additional measures incented within the program offerings.
- Retailers wanted to be able to have the program application forms submitted on line. Since the evaluation period of this study, the on-line application process has been implemented by the Utilities.

Retailers stated that program measures provide good value to the participants, specifically:

- For ENERGY STAR window with the rebate they are the same price as standard windows
- The *takeCHARGE* rebate make the costs of electronic and/or programmable thermostats competitive with the cost of the manual units

## Market Analysis

The evaluation period for this study was from 2009 through 2012, encompassing the program start-up phase through full scale implementation. Consequently, both program participants and non-participants have had a lengthy period of time to be exposed to the program. This was reflected in the high level of free ridership among customers and spill over among non-participants. However, it is important to recognize that the sample sizes for this study were relatively small and therefore in many cases the findings cannot be extrapolated to the population.

Free ridership is defined as the percentage of program savings that were incurred by participants who would have installed the measure in absence of the program. There are three components of free ridership that are analyzed and weighted to create an estimate of free ridership:

- Overall likelihood of purchasing the measure without the program
- The effect that that program had on the timing of the purchase of the measures
- The influence of the program on the quantity of measures purchased

The free ridership estimates was to classify to each response of the free ridership questions as a free rider, partial free rider or not a free rider. For example, if a participant responded that they were very likely to install the measure in the absence of the *takeCHARGE* rebate, they would be considered a 100% free rider. Conversely, if a participant stated that they were very unlikely to install the measure without the rebate, they were classified as not a free rider or 0% free rider. Some participant behavior may be partially influenced by the rebate offer but not entirely; these types of participants are considered a partial free rider. For example, if a participant said that they were somewhat likely to install the measures, they were considered a 50% free rider. Table E-3 shows the free ridership questions from the participant survey and the free ridership classification for the responses.

Table E-3 through Table E-5 show the free ridership and spill over for the *takeCHARGE* programs.

**Table E-3: Free Ridership Estimates**

| Free-ridership Estimates | ENERGY STAR Windows | Programmable and Electronic Thermostats | Basement and Attic Insulation |
|---|---|---|---|
| Weighted: 50% likelihood/25% timing/25% quantity | 62% | 48% | 53% |
| Only on Likelihood | 53% | 54% | 64% |
| Only on Timing | 82% | 60% | 59% |
| Only on Quantity | 85% | 78% | 72% |

The term "spill over" refers to a range of potential effects of energy efficiency programs. There are two types of spill over effects:

- **Participant spill over.** Participant spill over occurs when customers who have received financial and/or technical support for adopting an energy efficiency measure later purchase and install similar measures without using program incentives or services. To be counted as program effects, there must be some evidence that the customers in question took these actions as a result of their earlier participation in the program**.**
- **Nonparticipant spill over.** Nonparticipant spill over occurs when customers who have not participated in a program adopt the energy efficiency measures that the program supports as a result of the program. This could result from exposure to program-related public relations, vendor promotions, or word-of-mouth about the program and the benefits of efficiency measures.

Table E-4 shows the findings from questions that ask about the potential opportunities for measures among participants and the influence that their past participation had on influencing future participation. For example, 35% of ENERGY STAR Window participants have additional opportunities for other *takeCHARGE* measures, which could be additional ENERGY STAR windows or other measures. Of those respondents, 23% said that their past participation did influence their decision to purchase these measures.

**Table E-4: Participants Implementing Additional Measures and Spill Over Question Responses**

| Participants | Spill Over Weight | ENERGY STAR Windows | Insulation | Programmable/ Electronic Thermostats |
|---|---|---|---|---|
| Do you have opportunities for the other technologies? | | 71 | 67 | 86 |
| Yes | | 35% | 33% | 24% |
| No | | 60% | 64% | 75% |
| Did your participation in the program influence your decision to make these additional measures | | 25 | 22 | 21 |
| Yes | 100% | 23% | 44% | 18% |
| No | 0% | 73% | 56% | 82% |
| Spill over Estimate | | 8% | 14% | 4% |
| Do you think you would have purchased and installed these additional measures if you had not participated in the program? | | 25 | 22 | 21 |
| Yes | 0% | 87% | 84% | 91% |
| No | 100% | 13% | 16% | 9% |
| Spill over Estimate | | 5% | 5% | 2% |

**Responses may not add to 100% due to some respondents citing Do Not Know and Refused as their responses*

Table E-5 focuses on non-participants who installed measures that were offered under the program and gauged their awareness of the program and the program's influence in selecting the measure.

**Table E-5: Non-Participant Spill Over**

| Non-participants | Spill Over Weight | ENERGY STAR Windows | Insulation | Programmable/ Electronic Thermostats |
|---|---|---|---|---|
| Non-participants Who Installed Measures and Aware of Measures Offered in *takeCHARGE* | | 75 | 43 | 76 |
| Yes | | 68% | 57% | 61% |
| No | | 28% | 41% | 33% |
| Based upon awareness, did you purchase measures that met the program requirements? | | 51 | 24 | 47 |
| Yes | 100% | 73% | 87% | 66% |
| No | 0% | 18% | 5% | 34% |
| Spill over Estimate | | 50% | 49% | 40% |

**Responses may not add to 100% due to some respondents citing Do Not Know and Refused as their responses*

Table E-6 through Table E-8 summarizes the remaining market potential by program and geography. The remaining market potential values reflect the potential number of program participants based up customer data analysed for the 2009 to 2012 program years. The net market potential was calculated for each *takeCHARGE* program as follows:

*Net Market Potential = Gross Market Potential – Free ridership + Spill Over*

It is important to recognize that customers can chose to participate in multiple programs. The program net potential numbers refer to total number of potential participants. This is particularly important regarding the *takeCHARGE* Insulation program. For example, if a customer participant installs attic

insulation and basement wall insulation, they are count as two participants with savings associated with the individual measures in the program.

Tables E-6 and E-7 summarize the net market potential for the *takeCHARGE* Programs. It was based upon the following assumptions:

- Two program level market potential sums were created:
  - Maximum market potential assumed all participants and non-participants with additional measure opportunities install the measure. This value serves as the upper bound.
  - Market potential based upon the proportion of participants and non-participants who were aware of the program less the number of participants and non-participants who were not likely to install the measure.
- The free ridership value used in the analysis was the free ridership value based upon the responses to the likelihood of installing the measure, the influence of the rebate on the timing of the installation and the effect of the rebate on the quantity of the measure installed.
- The spill over for participants valued applied in the analysis was an average of the responses to the two spill over questions regarding the influence of the presence of the program on the purchasing decisions of the participants.

The high level of spill over attributable to non-participants helped to narrow the gap between the gross and net market potential estimates. However, this market analysis focused on four years of program experience, a length of time that can be sufficient to move the baseline practices of customers toward the energy efficient alternatives. This relationship will be discussed in greater detail in Section 6.3 regarding the exit strategies for the *takeCHARGE* programs.

**Table E-6: Net Market Potential, Free Ridership and Spill Over– *takeCHARGE* Programs**

| | ***takeCHARGE* Insulation Program** | | | | ***takeCHARGE* ENERGY Star Windows Program** | | | | ***takeCHARGE* Thermostat Program** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| Free Ridership | 53% | | | | 62% | | | | 48% | | | |
| Spill Over | | | | | | | | | | | | |
| *Participant* | 5% | | | | 5% | | | | 2% | | | |
| *Non-Participant* | 49% | | | | 50% | | | | 40% | | | |
| **Net Market Potential=Gross Market Potential - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential | 122,642 | 62,466 | 48,377 | 11,799 | 23,785 | 14,291 | 8,620 | 874 | 42,611 | 26,925 | 14,589 | 1,097 |
| Potential % less those who Chose Not to Install - Total | 65,606 | 32,850 | 24,089 | 7,365 | 15,285 | 9,072 | 5,859 | 354 | 19,295 | 12,891 | 6,404 | 756 |

**Table E-7: Net Market Potential – *takeCHARGE* Programs**

| | ***take*CHARGE Insulation Program** | | | | ***take*CHARGE ENERGY Star Windows Program** | | | | ***take*CHARGE Thermostat Program** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential | 129,344 | 66,177 | 50,841 | 12,326 | 29,352 | 17,946 | 10,397 | 1,010 | 47,813 | 30,171 | 16,457 | 1,185 |
| Potential % less those who Chose Not to Install - Total | 68,941 | 34,650 | 25,247 | 7,686 | 18,914 | 11,360 | 7,136 | 419 | 22,074 | 14,597 | 7,477 | 816 |
| **Net=Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential | 122,642 | 62,466 | 48,377 | 11,799 | 23,785 | 14,291 | 8,620 | 874 | 42,611 | 26,925 | 14,589 | 1,097 |
| Potential % less those who Chose Not to Install - Total | 65,606 | 32,850 | 24,089 | 7,365 | 15,285 | 9,072 | 5,859 | 354 | 19,295 | 12,891 | 6,404 | 756 |

**Table E-8: Net Market Potential – *takeCHARGE* Insulation Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential | 129,344 | 66,177 | 50,841 | 12,326 | 3,675 | 2,609 | 1,006 | 60 | 125,669 | 63,568 | 49,836 | 12,265 |
| Potential % less those who Chose Not to Install - Total | 68,941 | 34,650 | 25,247 | 7,686 | 1,346 | 996 | 330 | 20 | 67,595 | 33,653 | 24,918 | 7,666 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential | 122,642 | 62,466 | 48,377 | 11,799 | 2,103 | 1,493 | 576 | 34 | 120,539 | 60,973 | 47,801 | 11,765 |
| Potential % less those who Chose Not to Install - Total | 65,606 | 32,850 | 24,089 | 7,365 | 770 | 570 | 189 | 12 | 64,836 | 32,280 | 23,901 | 7,353 |

The methodology used to derive the net market potential for the *takeCHARGE* insulation program was applied to the ENERGY STAR window program. Similar to the insulation program, the significant spill over in the non-participant sector narrows the difference between gross and net for ENERGY STAR windows. Furthermore, the penetration of ENERGY STAR windows in Labrador was extremely high exhausting the remaining market potential among participants. Table E-9 shows the net market potential results.

**Table E-9: Net Market Potential – *takeCHARGE* ENERGY STAR Windows Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential Participants | 29,352 | 17,946 | 10,397 | 1,010 | 4,734 | 3,475 | 1,225 | 34 | 24,619 | 14,471 | 9,172 | 976 |
| Potential less % Chose Not to Install | 18,914 | 11,360 | 7,136 | 419 | 3,146 | 2,140 | 973 | 33 | 15,768 | 9,219 | 6,163 | 386 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential Participants | 23,785 | 14,291 | 8,620 | 874 | 2,120 | 1,556 | 548 | 15 | 21,665 | 12,735 | 8,072 | 859 |
| Potential less % Chose Not to Install | 15,285 | 9,072 | 5,859 | 354 | 1,409 | 958 | 436 | 15 | 13,876 | 8,113 | 5,423 | 340 |

Table E-10 presents the net market potential in each of the region for the *takeCHARGE* Programmable and Electronic Thermostat Program. As discussed in the gross analysis, there is no remaining potential for thermostats in the Labrador region based upon the responses in this survey. However, we reiterate that the findings from this size of survey sample may not be indicative of the population of eligible customers in Labrador. Again, high awareness of the program and its influence on purchasing patterns among non-participants yielded high spill over rates which drove up overall market potential.

**Table E-10: Net Market Potential – *takeCHARGE* Programmable and Electronic Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential Participants | 47,813 | 30,171 | 16,457 | 1,185 | 4,562 | 2,780 | 1,781 | - | 43,251 | 27,391 | 14,676 | 1,185 |
| Potential less % Chose Not to Install | 22,074 | 14,597 | 7,477 | 816 | 3,128 | 1,712 | 1,416 | - | 18,946 | 12,885 | 6,061 | 816 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential Participants | 42,611 | 26,925 | 14,589 | 1,097 | 2,545 | 1,551 | 994 | - | 40,065 | 25,373 | 13,595 | 1,097 |
| Potential less % Chose Not to Install | 19,295 | 12,891 | 6,404 | 756 | 1,745 | 955 | 790 | - | 17,550 | 11,936 | 5,615 | 756 |

# Key Recommendations

## Process and Program Design Recommendations

Overall, the suite of *takeCHARGE* programs was operating smoothly and delivered a high level of satisfaction to customers, vendors and to the Utilities. However, there were several areas of program design and delivery that could be modified or strengthened.

- Continue to seek and implement procedures to streamline the participation burden on customers and retailers. Offering an on-line solution should help to achieve this objective but program staff should continue to monitor and proactively modify processes as needed.
- Build upon the existing relationship with retailers and identify ways to provide more one-on-one support. Perhaps consider increasing the frequency that program staff directly contact retailers or offer a program 'hot line' for retailers with questions.
- Examine the market potential opportunities for offering new emerging technologies including:
  - Future home automation - smart thermostats
  - On-demand hot water systems.

## Market Analysis Recommendations

The central recommendation stemming from the market analysis was what the next steps should be for the current configuration of the *takeCHARGE* programs. The results of this study indicate that the current *takeCHARGE* programs have effected changes in customers' and vendors' purchasing practices and creating a more efficient baseline market. The Utilities are now at a point when they are considering expanding their energy efficiency and examining their current offerings

Going forward the Utilities should give important consideration to the strong awareness of energy efficiency among existing customers and market actors (e.g., contractors, builders and retailers) and identified opportunities to leverage the residential construction boom in the region. DNV GL recommends that the Utilities should explore the following program options.

*Existing Homes Market*

1. Assess a Whole House Program or Bundle Energy Efficiency Measures

   A broader more comprehensive approach to the existing home market is to take whole house approach to energy efficiency. A whole house program would incentivize participants to implement all eligible measures rather than just installing a single measure e.g., attic insulation. This type of program focuses on improving the overall energy performance of the home and can potential capture additional savings opportunities. An alternative to the whole house approach would be to bundle a smaller sub-set of measures together e.g., attic insulation, basement ceiling and basement wall insulation with programmable thermostats.

2. Explore the Feasibility of a Secondary Refrigeration and Freezer Recycling Program

   Secondary refrigerators and freezers are not typically energy efficient. Secondary refrigerators are often the former primary refrigerators that have been replaced by homeowners with newer more efficient models. Secondary refrigerators that are in non-space conditioned areas (e.g., garages and basements) and are often fairly empty most of the year operate less efficiently. Utilities in the United States have implemented refrigeration and freezer recycling programs that

remove the units from the grid. In these programs, refrigerators and freezers are picked up at the customers' home free of charge by a utility sanctioned contractor, the customer receives a rebate and the units are then disposed of by the contractor in an environmentally appropriate manner. The Utilities should explore the penetration of secondary refrigerators and freezers in their service territory to assess the applicability of this type of program.

3. Consider Including Water Saving Measures

   Residential water saving measures including low flow shower heads and faucet aerators may provide a low cost way to reduce the energy consumption of water heaters. These could be coupled as part of a whole system or bundled program.

*New Construction Market*

1. Consider Implementing ENERGY STAR New Homes Program

   There has been a large influx of income into the Utilities' region which has resulted in boom in the residential construction market with new larger homes being built. The implementation of the National Energy Code of Canada has helped to established more rigorous energy efficiency standards in new homes. The code incorporates many of the measures included in the current *takeCHARGE* programs. However, there are opportunities to obtain additional savings in new homes. Offering an ENERGY STAR New Homes Program is one option to push the energy savings opportunities further. The ENERGY STAR New Homes program focuses on the total performance of the home by establishing efficiency requirements for shell measures and building practices that exceed building code requirements and by requiring the implementation of ENERGY STAR appliances. This type of program is quite different than the Utilities' existing rebate programs and will require training contractors and buildings on the ENERGY STAR implementation and performance criteria. Also, the program will require inspection and certification processes.

2. Examine the Feasibility of Implementing a R2000 Compliant Program

   Another option to consider for the new construction market is to take the energy savings to an even higher level is to design and implement a program that meets the performance criteria set forth in the R2000 program. As with the ENERGY STAR New Homes Program, the R2000 program would require training contractors and builders on the R2000 requirements and would need to include inspection and certification processes to determine if the home meets the standards of the program.

# 1 INTRODUCTION

## 1.1 Background

Newfoundland Power and Newfoundland Labrador Hydro (Hydro) began offering joint energy efficiency programs to their residential customers in 2009. The *takeCHARGE* programs were a suite of programs offered by Newfoundland Power and Hydro (the Utilities). The *takeCHARGE* programs include the following:

- Insulation Rebate Program – provides rebates for insulating basement walls, basement ceilings and attic and crawl spaces
- Thermostat Rebate Program – offers rebates for programmable and electronic thermostats with a temperature rating of +/- 0.5 degrees Celsius
- ENERGY STAR Windows Rebate Program – provides rebates for purchasing and installing ENERGY STAR certified windows.

The *takeCHARGE* programs are offered to homeowners with electric space heat or a supplemental heating system whose annual electricity usage equals or exceeds 15,000 kWh. Furthermore, the customers' home must be their primary residence and be a detached, semi-detached or mobile/modular home on a permanent foundation.

In November 2013, the Utilities selected DNV GL to conduct a process and market evaluation of the *takeCHARGE* programs. The primary objectives included:

- Provide an assessment of the effectiveness of program delivery from the customer and program partners' perspectives
- Gain an understanding of barriers to program success and operational effectiveness
- Provide an in-depth examination of the adoption rates and motivations for installing the technologies offered by the programs for both program participants and non-participants.
- Determine the current and remaining effectiveness of these programs as market intervention strategies, and when and how the *takeCHARGE* programs should be retired

The evaluation period for the study was 2009 through 2012. Given that the *takeCHARGE* programs have been fully implemented and actively marketed to customers, retailers and contractors, the Utilities keen interest in this study was to focus on the market characterization aspects of the study. Therefore, the study included a detailed analysis of the market baseline practices, program attribution and remaining market potential for each program.

## 1.2 Organization of Report

This report presents the findings and recommendations from process and market analysis. Section 2 of the report discusses objectives and the methodology employed for the process and market analyses. Section 3 provides a detailed description for each program and presents the process evaluation findings. Results from the customer surveys including demographics, reasons for participating or not participating in the programs; satisfaction program and rebates; role and satisfaction with retailers and contractors are discussed in Section 4. Section 5 presents the observations and trends in customer purchasing patterns and in projects obtained through interviews with contractors and retailers. The market analysis is provided in Section 6. This section includes the baseline market assessment for participants and non-participants; attribution analysis (free ridership and spill over); remaining market potential and program exit strategy recommendations. Finally, Section 7 discusses best practices for impact evaluations and Section 8 summarizes the key findings and recommendations from the study.

# 2 OBJECTIVES AND METHODOLOGY

## 2.1 Evaluation Objectives

The DNV GL team conducted market and process evaluations of three residential *takeCHARGE* Energy Savers Rebate Programs:

- Insulation Rebate Program
- Thermostat Rebate Program
- ENERGY STAR Window Rebate Program

The primary focus of the process evaluation was to provide an assessment of the effectiveness of program delivery from the customer and program partners' perspectives, and an understanding of barriers to program success and operational effectiveness. The market evaluation provided an in-depth examination of the adoption rates and motivations for installing the technologies offered by the programs for both program participants and non-participants. Table 2-1 shows the key objectives for each evaluation.

**Table 2-1: Process and Market Evaluation Objectives**

| Process and Market Evaluation Objectives |
|---|
| **Process Evaluation Objectives** |
| • Assist with the development of exit strategies for the three residential *takeCHARGE* programs including determining major factors and market penetration levels for consideration for exit strategy development. |
| • Determine barriers that limit program performance and attitudes toward programs for retailers, contractors, builders and non-participants. |
| • Review each program partners' processes and level of engagement for opportunities for improvement in the three residential programs. |
| • Recommend the best practice approaches for conducting an impact evaluation for the ENERGY STAR windows, programmable thermostats and basement and attic insulation programs. |
| **Market Evaluation Objectives** |
| • Estimate the total sales of ENERGY STAR windows and programmable thermostats in Newfoundland Power and Hydro service territories during the evaluation period of 2009-2012 and expected future market trends. |
| • Estimate the baseline shares of various window, thermostats and insulation technologies, using the results of vendor surveys. |
| • Estimate the upper and lower bounds of the portion of those market shares that could be attributed to the programs. |
| • Confirm installation (actual compliance level) and free ridership level in each of the three residential programs. |
| • Determine rate or estimated quantity technology adoption of ENERGY STAR windows, programmable thermostats and basement insulation "outside the program" that could be attributed to effects of the program (spill over). |
| • Identify factors that are driving or inhibiting the promotion and uptake of efficient products in the relevant technologies. |

Based on the findings of the two components of the evaluation, recommendations were provided regarding an appropriate exit strategy for the programs. In addition, the results of this study were used to recommend the best practice approaches for conducting an impact evaluation for the ENERGY STAR windows, programmable thermostats and basement and attic insulation programs.

## 2.2 Evaluation Methodology and Approach

### 2.2.1 Overview of Data Collection

The market and process evaluations integrated data from five key primary data collection activities:

- Review of program background materials and documentation
- In-depth interviews with program staff
- Customer telephone surveys: program participants and non-participants
- Builder and contractor telephone interviews and surveys: participants and non-participants
- Retailer and manufacturer interviews: participants and non-participants.

Table 2-2 shows how each data collection task and/or survey instrument addressed the key research issues and evaluation objective.

**Table 2-2: Key Research Questions and Data Collection Methods**

| Research Questions and Primary Data Collection Methods | Program Staff In-depth Interviews (IDI's) | Trade Ally Interviews & Survey | Customer surveys | Data Review* |
|---|---|---|---|---|
| 1. What are the primary market imperfections that are common to the target market segments? (e.g., residential new construction and existing housing) | ✓ | ✓ | | |
| 2. What remaining barriers exist to wider adoption of the targeted measures? | ✓ | ✓ | ✓ | |
| 3. How well is the current set of programs addressing the market imperfections? | ✓ | ✓ | ✓ | |
| 4. What can be done to more effectively overcome the identified market imperfections and to increase the rate of customer acceptance and implementation of each end use measures included in the program? | ✓ | ✓ | ✓ | |
| 5. Are the target market segments appropriately defined, or are there gaps or underserved segments that present an opportunity for the measures being promoted? (i.e., assess the remaining market) | ✓ | ✓ | ✓ | ✓ |
| 6. What is the status of penetration of the energy efficient measures promoted through the programs? | | | ✓ | ✓ |
| 7. Are the communication channels and delivery mechanisms appropriate for the target market segment? | ✓ | ✓ | ✓ | |
| 8. How well does the program design meet the needs of contractors, equipment retailers, builders in promoting these measures to their customers? | ✓ | ✓ | | |
| 9. What barriers exist to the wider engagement of contractors, retailers and builders in promoting these measures? | ✓ | ✓ | | |
| 10. What were the motivations of participating customers for installing the measures through the program (i.e., free-rider analysis) | | ✓ | | ✓ |
| 11. What is the level of satisfaction with the programs and the Utilities of each stakeholder group that is engaged with the program (e.g., customers, contractors, builders, retailers) | | ✓ | ✓ | |
| 12. Estimate the total sales of ENERGY STAR windows and programmable thermostats in Newfoundland and Hydro during the evaluation period of 2009-2012 and expected future market trends. | | ✓ | ✓ | ✓ |

| Research Questions and Primary Data Collection Methods | Program Staff In-depth Interviews (IDI's) | Trade Ally Interviews & Survey | Customer surveys | Data Review* |
|---|---|---|---|---|
| 13. Estimate the baseline shares of various window, thermostats and insulation technologies, using the results of vendor surveys. | | ✓ | ✓ | ✓ |
| 14. Estimate the upper and lower bounds of the portion of those market shares that could be attributed to the programs. | | ✓ | ✓ | ✓ |
| 15. Confirm installation (actual compliance level) and free ridership level in each of the three residential programs. | | ✓ | ✓ | ✓ |
| 16. Determine rate or estimated quantity technology adoption of ENERGY STAR windows, programmable thermostats and basement insulation "outside the program" that could be attributed to effects of the program (spill over). | | ✓ | ✓ | ✓ |

*Data Review refers to the review of background materials (e.g., written program materials, # of program measures purchased and/or installed, billing information)

Table 2-3 shows the sample sizes for each of the data collection tasks.

**Table 2-3: Data Collection Plan for Process and Market Evaluations**

| Target Group | Population | Sample Size | In-Depth Interviews | Quantitative Surveys |
|---|---|---|---|---|
| Utility Staff | | | | |
| Newfoundland Power and Hydro Program Staff | 24 individuals who design, implement and evaluate the programs | 6 | X | |
| Contractors & Builders | | | | |
| Insulation contractors | Participating and non-participating builders and contractors in the sectors targeted by the programs | 14 Participating<br><br>12 Non-participating | x | x |
| Thermostat vendors and installers | | | | |
| Window contractors | | | | |
| Builders | | | | |
| Customers | | | | |
| Program Participants - in one or more *takeCHARGE* programs | Newfoundland Power = 4,851<br><br>Hydro = 156 | 151 | | X |
| Non-participants - who qualify are eligible for the *takeCHARGE* programs | Sample developed using NP and Hydro customer billing data | 212 | | X |
| Retailers and Manufacturers | | | | |
| Participating Retailers/Manufacturers | Actively Engaged Retailers - big box and smaller retailers | 31 | | X |
| Non-participating | Retailers | 5 | | X |

## 2.2.2 Sample Design

### 2.2.2.1 Participant and Non-Participant Customer Surveys

The Utilities' provided the DNV GL team with an extract of the three *takeCHARGE* program participant files for the 2009 through 2012 program years and residential billing information. A non-participant population file was created by matching account numbers from the participant program file with the customer billing records and deleting any matching records. Both the participant and non-participant were stratified by three major geographies:

- Avalon
- Rest of Island
- Labrador

The sample size of 150 was allocated across geographies in proportion to the total number of residential customers in each region: Avalon 60%, Rest of Island 30% and Labrador 10%. Table 2-4 shows the sample quotas and the number of completed surveys by geography. Also, customers who participated in more than one program were interviewed about each of the programs they participated in between 2009 and 2012.

**Table 2-4: *takeCHARGE* Participant Sample Sizes**

| Geography | Sample Quota | Sample Size (n) |
|---|---|---|
| Avalon | 85 | 94 |
| Rest of Island | 50 | 50 |
| Labrador | 15 | 7 |
| **Total** | **150** | **151** |

A similar methodology was used to select the sample for the non-participant sample.

**Table 2-5: *takeCHARGE* Non-Participant Sample Sizes**

| Geography | Sample Quota | Sample Size (n) |
|---|---|---|
| Avalon | 126 | 127 |
| Rest of Island | 63 | 64 |
| Labrador | 21 | 21 |
| **Total** | **210** | **212** |

The sample sizes resulted in an overall precision level of 7.9% for the participant survey and 6.7% for non-participant survey at the 90% confidence level.

**Table 2-6: Customer Survey Precision Levels**

| | Participants | | Non-Participants | |
|---|---|---|---|---|
| **Geography** | **Sample Size (n)** | **90% Confidence Interval Precision Level** | **Sample Size (n)** | **90% Confidence Interval Precision Level** |
| Avalon | 94 | +/- 10.1% | 127 | +/- 8.7% |
| Rest of Island | 50 | +/- 13.8% | 64 | +/- 12.3% |
| Labrador | 7 | +/- 36.5% | 21 | +/- 21.38% |
| **Total** | **151** | **+/- 7.9%** | **212** | **+/- 6.7%** |

The next step was to create sampling weights that were applied to the survey results to expand the survey data back to the original target population. The weighted estimates were computed in order to obtain unbiased estimates of the *population* – if sample weights had not been used then the simple descriptive statistics derived from the respondent data could be biased because sub-groups, in this case geographies, were not sampled at the same rate and respondents within subgroups do not respond to the survey with the same propensity.

For this study, a final sampling weight was created for each respondent as the product of two factors:

1. **The inverse of the probability of selection.** Houses were randomly selected for this study within strata defined by participation status and three regions (Avalon, Labrador and Rest of Island).
2. **An adjustment to correct for eligibility and nonresponse**. This adjustment was also computed by participation status and the three regions. Telephone numbers on the original frame were considered ineligible if they were a government, business, an otherwise ineligible housing unit type or if housing unit type could not be determined.

Table 2-7 provides a summary of the original frame count, the eligibility rate, the response rate and the final analytic weight for all strata. The survey concluded with nearly a 99% eligibility rate, a 2.8% response rate and the final analytic weights varied from 27 to 1,571.

**Table 2-7: Eligibility, Response and Final Sample Weights[1]**

| Sampling Metric | Total | Participants | | | Non-Participants | | |
|---|---|---|---|---|---|---|---|
| | | Avalon | Rest of Island | Labrador | Avalon | Rest of Island | Labrador |
| Total Respondents | **363** | 94 | 50 | 7 | 127 | 64 | 21 |
| Eligibility Rate | **99%** | 97% | 99% | 92% | 92% | 94% | 100% |
| Response Rate* | **3%** | 32% | 30% | 14% | 14% | 14% | 0% |
| Final Sample Weight For Each Respondent | | 79 | 112 | 27 | 569 | 1,486 | 1,571 |

*Response rate is defined as the number of people who completed the survey divided by sum of the number of completed surveys and the number of non-respondents.

### 2.2.2.2 Retailer Survey

The Utilities' provided the DNV GL team with a list of the retailers participating in the *takeCHARGE* programs. Both Utilities define participating retailers as a retail establishment that sells one or more of the technologies offered in the programs, which have been actively contacted by one of the Utilities and have received promotional materials for the programs. While the sample sizes for the participating retailers were small, we wanted to ensure that the responses were weighted to the population and reflected the relative distribution of retailers between the two Utilities. Sampling weights for the participating retailers were created using the same methodology as described for the customer surveys. The response rates and sampling weights are shown in Table 2-8.

**Table 2-8: Participating Retailer Sampling Weights**

| Sampling Metric | Total | Participants | | |
|---|---|---|---|---|
| | | Avalon | Rest of Island | Labrador |
| Sample Frame | **218** | 120 | 78 | 20 |
| Eligibility Rate | **98%** | 95% | 100% | 100% |
| Eligible Population | **214** | 114 | 78 | 20 |
| Respondents | **31** | 8 | 22 | 1 |
| Response Rate | **56%** | 40% | 85% | 11% |
| Sample Weight For Each Respondent | | 14.2857 | 3.5455 | 20.0000 |

DNV GL created a list of non-participating retailers in the Avalon, Rest of Island and Labrador regions. The list of retailers was compiled from public data sources and web researches and screened for participation during the interview. Non-participating retailers were defined as retailers that sold the technologies offered in the *takeCHARGE* programs but were either unfamiliar with the program or who had not received any promotional materials or had any contact with the Utilities regarding the program. In total five interviews were completed with non-participating retailers: three in Avalon, one in Rest of Island and one in Labrador. The weighting of the survey results for non-participants was not done due to the small sample sizes. The results for non-participating retailers cited in this study are unweighted descriptive statistics.

### 2.2.2.3 Builder and Contractor Survey

The DNV GL team conducted in-depth and quantitative interviews with participating and non-participating contractors in the Avalon, Rest of Island and Labrador regions. The Utilities provided the

[1]Note that customers can participate in multiple programs multiple times. Therefore these population numbers reflect the number of participants not number of customers. For example, a customer who participated twice would be counted as two participants.

DNV GL team with the list of participating contractors and builders. The sample frame for the non-participant contractors was developed based on data from the InfoUSA database for business establishments in each region. We selected the North American System Industry Classification System[2] (NAICS) categories that most closely corresponded to the windows, insulation and electric heating markets which included: residential builders and remodelers, insulation contractors, heating and cooling contractors, window installers, and home supply retailers. These records identified retailers and contractors by specialty and provided reasonably accurate records of numbers of employees, which was used as a proxy for volume of equipment or projects sold and/or installed. Despite narrowing the InfoUSA data extract to narrow subset of NAICS categories, the data still required significant processing to identify the contractors and builders who were active in the residential housing market during the evaluation period and involved in installing windows, insulation and thermostats. Of the original 524 business establishments only 104 businesses qualified as non-participating contractors and builders. Respondents were selected randomly from the qualified non-participating contractors.

In total 26 interviews and surveys were completed across the Utilities, 14 in-depth interviews with participating contractors, six in-depth interviews with non-participating contractors and six quantitative surveys with non-participating contractors. Table 2-9 shows the breakout of completed interviews by participant type, company and data collection instrument. The response rate for all participants was 20% and for non-participants was 11.5%.

**Table 2-9: Contractor/Builder Survey Completes**

| Data Collection Instrument | Total | Participants - Completes | | | Non-Participants - Completes | | |
|---|---|---|---|---|---|---|---|
| | | Avalon | Rest of Island | Labrador | Avalon | Rest of Island | Labrador |
| In-depth Interviews | **20** | 9 | 4 | 1 | 4 | 2 | 0 |
| Quantitative Surveys | **6** | 0 | 0 | 0 | 1 | 4 | 1 |
| Total Respondents | **26** | 9 | 4 | 1 | 5 | 6 | 1 |

Of the participating contractors, nine were located in Avalon, five were from the Rest of Island and one from Labrador. The results are presented in Section 5.1 and are reported by geography for the participating contractors. However given the small number of non-participant contractors, the findings for non-participants are not broken out by geography.

Out of 26 contractors interviewed, only two were specialized contractors. The majority of general contractors work in predominately in new construction.

Table 2-10 shows the distribution by contractor type.

[2] NAICS codes are used to identify a firm's primary business activity. NAICS codes were developed by the U.S. federal government in cooperation with Canadian and Mexican statistical agencies.

**Table 2-10: Sample Distribution by Contractor Type**

| Contractor Type | TOTAL | Participants | Non-Participants |
|---|---|---|---|
| General Contractor: Predominately New Construction | 13 | 10 | 3 |
| General Contractor: New Construction and Remodelling | 9 | 4 | 5 |
| General Contractor: Remodelling Only | 2 | 0 | 2 |
| Specialised Contractor | 2 | 0 | 2 |
| **TOTAL** | **26** | **14** | **12** |

- **Results of contractor and vendor interviews.** In the course of conducting many studies that seek to characterize market conditions through interviews with supply side actors, DNV GL has developed and refined methods to estimate market shares with relatively high levels of precision using a ratio estimator approach. The basic elements of this approach are as follows.
  - Sample Development. We used the InfoUSA database of business establishments for the sample frame. NAICS categories to be sampled included: residential builders and remodelers, insulation contractors, heating and cooling contractors, window installers, and home supply retailers. These records identify retailers and contractors by specialty and provide reasonably accurate records of numbers of employees, which is a usable proxy for volume of equipment or projects sold and/or installed. We grouped the firms by number of employees and by province. The sample was randomly selected from each size and geography group.
  - Weighting and computation of survey results. Vendor and contractor survey responses were weighted to reflect the number of units of the product category in question (insulation projects, thermostats, windows) reported as sold or installed by the sample establishment as well as by the population weight of the size stratum from which the firm was drawn. Where the questionnaire seeks responses in the form of a number or percentage—say, the percent of qualifying windows among all those that are installed —survey responses will be calculated using the combined ratio estimator $\hat{R}_c$:

$$\hat{R}_c = \frac{\sum_h \frac{N_h}{n_h} \sum_i B_{h_i} x_i}{\sum_h \frac{N_h}{n_h} \sum_i x_i},$$

where

$i$ = sample contractor or vendor,

$N_h$ = number of contractors or vendors in the population in sample stratum $h$,

$n_h$ = number of contractors or vendors in the sample in stratum $h$,

$B_{h_i}$ = contractor $i$'s response (expressed as a number or percentage), and

$x_i$ = number of relevant units contractor $i$ reported sold or installed in the evaluation period.

If the question elicits a categorical response (e.g., yes/no), a $B_{h_i}$ will be created for each possible response. For estimates of proportion, the selected response $B_{h_i}$ = 1. For the response/s not selected, $B_{h_i}$ = 0.

This procedure essentially weights responses by the reported number of units sold or installed for each sample firm, thus providing an explicit representation of market share. The use of the combined ratio estimator supports the estimate of a standard deviation and standard error for each variable. The standard errors will be used to calculate appropriate measures of precision for various kinds of results. For some variables, it is more appropriate to use the weighted mean or proportion of the stratified random sample, rather than the ratio estimator. This is the case, for example, in estimating the average number of units installed and, from those averages, the total for the population. It is important to recognize that given the relatively small sample sizes for the builder and contractor surveys, the weighted responses have very low levels of statistical precision and may not be representative of the population.

## 2.2.3 Market Sizing and Share Analysis

### 2.2.3.1 Estimation of Baseline Market Shares

The baseline market share of program-qualifying equipment and insulation projects was defined as the market share that would have obtained if the program had not been in place. This was an essentially unobservable quantity was estimated using the following data sources and analysis techniques.

- **Market share in Avalon, Rest of Island and Labrador prior to the program.** Data on this proxy for baseline market share can be developed through the customer surveys, contractor surveys, and older secondary data sources.
- **Building codes and product standards.** Codes and standards essentially identify a minimum standard. If efficiency standards are scheduled to be increased in the near future, they provide a trajectory for increases in market share of the qualifying equipment over time. Of course, compliance seldom reaches 100 percent due to compliance issues. Studies of code changes and enforcement can be used to generate trends in baseline share of equipment that meet impending changes in standards.

### 2.2.3.2 Estimate of Current Market Share and Future Trends

The key data collection tool for the market evaluation was the customer surveys. The customer survey data were used to characterize the effect of the program on their equipment purchases and was the principal method to estimate free ridership, spill over, and program net effects. The market analysis also estimated total sales and market share for each end-use technology offered in the programs, e.g., attic and basement insulation, thermostats and ENERGY STAR windows. Customer surveys, contractor surveys, and retailer/manufacturer surveys were used to develop estimates of the current baseline market share. The contractor and retailer surveys were used to provide perspective and corroboration for the estimates of free ridership and spill over rates generated from the participant and non-participant customer surveys.

The results of the market analysis of the net effects of the program on qualified measure market share and sales was one of the primary components for developing recommendations for exit strategies. Other factors shaping the exit strategy recommendations included customer awareness and understanding of product benefits, availability of efficient products, customer willingness to pay, and the degree to which vendors have integrated marketing of qualifying products into their overall business strategy and

practices. These factors and their role in exit strategy decisions were included in the context of the process evaluation.

Generally speaking, manufacturer shipment data or retailer sales data provide the most accurate and analytically useful sales and market share information for construction and consumer product but due to the confidentiality regarding sharing such sensitive data is extremely difficult to collect. Thus, for the three product types supported by *takeCHARGE* programs, market size and market share of program-qualified products were estimated using the following information sources.

- **Results of the customer survey.** In the surveys of both participating and non-participating customers were asked whether they purchased and/or installed any of the three supported product types and if so, capture information on the timing, extent, efficiency rating, and other relevant details of the purchase. The results from the participant and non-participant surveys were weighted to estimate the portion of customers who purchased the goods and services in question over the evaluation, as well as the market share of qualifying goods and services. For insulation, qualifying projects were those that increased pre-existing levels to those supported by the program. For thermostats and windows, qualifying purchases included those that met program eligibility requirements.
- **Results of contractor and vendor interviews.** Similarly, the results of the contractor and retailer surveys were weighted as described above, to estimate the market share of the technologies offered through the *takeCHARGE* programs and to identify current and future sales trends for those products.
- **Secondary sources.** There were two secondary sources that were reviewed to corroborate market size and share of efficient models. These included:
  - Statistics Canada: Census of Canada 2011. The 2011 Census contains information on the number of housing units of various types, number of business establishments by type and various measures of size, and other kinds of information that can be used in estimates of market size.
  - Natural Resources Canada: Survey of Household Energy Use 2007. This document contains data at the regional level (Atlantic Provinces) on most of the elements needed to estimate market size for the products supported by the *takeCHARGE* programs. These include saturation and purchase within the past five years of attic, wall, and sill insulation, saturation of electronic and programmable thermostats, and saturation of single, double, and low-e windows. These data are developed from a large, well-structured sample, including 267 homes in Newfoundland and Labrador.

### 2.2.3.3 Attribution, Free-ridership and Spill over

The formal definition of net program savings typically used in the energy efficiency evaluation industry is:

Net Savings = Verified Gross Savings Program savings – Free Ridership + Spill over.[3]

The basic concepts involved are relatively straightforward. Free ridership denotes implementation of measures that participants in the program would have undertaken during the evaluation period even if the program had not been offered. Free ridership accounts for the fact that most technologies supported by energy efficiency programs are already established in the market and that many program participants' motivation and capability to undertake energy efficiency projects is generally higher than average for the target population. The term "spill over" refers to a range of potential effects of energy efficiency programs. Analysts and regulators identity the following types:

[3] For a recent example of treatment of this topic in the industry, see: State and Local Energy Efficiency Action Network. 2012. *Energy Efficiency Program Impact Evaluation Guide*. Prepared by Steven R. Schiller, Schiller Consulting, Inc., www.seeaction.energy.gov.

- **Participant spill over.** Participant spill over occurs when customers who have received financial and/or technical support for adopting an energy efficiency measure later purchase and install similar measures without using program incentives or services. To be counted as program effects, there must be some evidence that the customers in question took these actions as a result of their earlier participation in the program**.**
- **Nonparticipant spill over.** Nonparticipant spill over occurs when customers who have not participated in a program adopt the energy efficiency measures that the program supports as a result of the program. This could result from exposure to program-related public relations, vendor promotions, or word-of-mouth about the program and the benefits of efficiency measures.

While the concepts of free ridership and spill over are relatively straightforward, estimating their magnitude generally is not. As is the case with estimation of baseline, which conceptually is related to both free ridership and spill over, neither free ridership nor spill over is directly observable. It is best to gather information from a number of sources to support a robust estimate of program net effects.

The principal method used for assessing attribution of observed changes in sales or market share of efficient equipment in this study focused on analysis of self-reports of program effects by reported by program participants and non-participants. This approach typically involved using the customer surveys to elicit their assessment of the program's influence on their decisions to adopt energy efficiency measures or practices. The participant batteries of questions structured to probe the effect of the program on the timing, extent, and features of the projects in question, as well as the relative importance of the program versus other decision factors. In addition, the non-participant surveys included a complementary set of questions that assessed the type, timing and motivation for installing program eligible measures outside of the programs.

For this study and the nature of the equipment installed, we used customers' characterization of the effect of the program on their purchases as the principal method to estimate free ridership, spill over, and program net effects. We also estimated total sales of the end-use technologies addressed by the program and market share of efficient equipment in the Utilities' service territory, and develop an assessment of baseline market share using the results of the customer surveys, contractor surveys, and secondary sources. These latter analyses will be used to provide perspective and corroboration for the estimates of free ridership and spill over rates generated from the participant and non-participant customer surveys.

# 3 PROCESS ANALYSIS AND FINDINGS

## 3.1 Program Design and Implementation

This section will provide a brief overview of the program offerings and detail the process customers and program partners (i.e., retailers and contractors) go through in order to participate in the *takeCHARGE* ENERGY STAR Window, Insulation, and Thermostat Rebate programs.

**ENERGY STAR Window Rebate Program**

The ENERGY STAR Window rebate program offers a rebate at the rate of $2 per square foot of installed window to existing and new home owners who purchase and install Energy STAR Qualified windows in their home. Program managers and staff interviewed for this evaluation confirmed that the program ideally targets customers who own older homes with inefficient windows. The following is a matrix[4] detailing window size and market cost estimates, along with the rebate values available to a *takeCHARGE* participant.

**Figure 3-1: Example of ENERGY STAR Window Rebate Program: Project Options, Costs, and Available Rebates**

| Window Size | Cost of Standard Window[1] | Cost of ENERGY STAR Window[1] | takeCHARGE Rebate |
|---|---|---|---|
| 24" x 40" | $271 | $293 | $13 |
| 48" x 48" | $444 | $496 | $32 |
| 96" x 43" | $860 | $999 | $57 |

There are multiple eligibility requirements in order for participants to qualify for the ENERGY STAR Window Rebate program. They include homeowners must have an active electricity account, and the home itself should be a detached, semi-detached, or a mobile/modular unit on a permanent foundation. The home ultimately retrofitted with ENERGY STAR Window projects should be intended as a residence. Finally, the home should be either all-electric, or have a supplementary heating system is in place that the home has an annual electricity usage equal to or greater than 15,000 kWh. Customers with the above summarized eligibility requirements likely have the largest opportunity to "improve a home's building envelope and reduce space heating energy consumption."[5]

The customer participation process for the ENERGY STAR Window Rebate program is straightforward. If the customer is eligible to participate in the program, he or she purchases and installs ENERGY STAR Qualified windows in their home. The customer can get a program rebate application either from the web site, or in some instances, from their contractor or retailer directly. Program staff confirmed that retailers often drive the application process for the Windows program by educating customers about the program, having forms available when making the sale, and in some cases, assisting the customer in filling out the rebate forms. Once the project is complete the customer submits, by mail, a completed and signed

[4] From the *takeCHARGE* ENERGY STAR Windows Rebate Program web site. 2/17/2012. Available at: http://takeCHARGEnl.ca/
[5] Five Year Energy Conservation Plan, 2012-2016. Newfoundland Power – 2013/2014 General Rate Application. September, 2012.

ENERGY STAR Window Rebate Application to their electric utility. Customers also have to include purchase receipts, manufacturer detail that includes the windows' model numbers and the windows' gas status and frame size.

The program rebate web site states that participants can expect their rebate within eight weeks after submitting their application and supporting documentation. Rebates are most often awarded in the form of a credit to the participant's utility bill for the rebate amount; however, program staff stated that participants can and will be cut a check if they appeal to the utility and indicate they prefer a check rather than a bill credit.

About five percent of customers who install an energy efficiency measure through the *takeCHARGE* programs are subject to a post-installation audit after project completion. The program web site indicates that an inspection visit by the utility can happen at any point up to twelve months after installation. The program rebate form indicates that inspection window is up until 15 months after installation. Staff interviewed for this evaluation indicated that audit compliance is nearly 100%.

**Insulation Rebate Program**

The Insulation Rebate program targets Newfoundland Power and Hydro customers who have insulation deficits in their home, and offers rebates to program participants who choose to increase the insulation levels in their homes. Staff interviewed described this program as targeting owners of homes that were at least 20 to 25 years old with little or no basement insulation. Figure 3-2 provides details about project size, insulation (measure) choice, and available *takeCHARGE* rebates at each project / product price point.

**Figure 3-2: Insulation Rebate Program: Project Options, Measure Costs, and Available Rebates[6]**

| Basement Size | Cost to Insulate[1] | | takeCHARGE Rebate | |
|---|---|---|---|---|
| | R-12 | R-20 | R-12 | R-20 |
| 1000 sq. ft. | $1,300 | $1,750 | $240 | $400 |
| 1500 sq. ft. | $1,950 | $2,600 | $360 | $600 |
| 2000 sq. ft. | $2,500 | $3,500 | $480 | $800 |

The eligibility requirements for this program mirror those of the ENERGY STAR Windows Rebate program, detailed earlier. In short, a customer aiming to participate in the Insulation Rebate program must a) be a homeowner with an active electricity account, b) have an all-electric home or a supplementary heating system is in place that the home has an annual electricity usage equal to or greater than 15,000 kWh, c) own a home that's intended to be a residence and is detached, semi-detached, or a mobile/modular

[6] The program web site indicates that rebates are also available for ceiling projects, but that customers cannot receive rebates for both basement and ceiling insulation projects. Further, no rebate or price information appears available for ceiling projects.

home on a permanent foundation. Participants are not able to repeat rebate requests for the same project.[7]

The Insulation Rebate participation process is nearly identical to the Window Rebate program; that is, eligible customers complete an insulation project by purchasing and installing CSA approved insulation at one of the program designated R-values, acquire and complete a program rebate form – along with project receipts, and receive an on-bill credit for the program rebate amount.

Like other *takeCHARGE* programs, this program indicates that the customer's electric provider may conduct a post-installation visit to inspect the project.

**Thermostat Rebate Program**

The Thermostat Rebate program offers rebates to Newfoundland Power and Hydro homeowners who replace manual thermostats with programmable thermostats or electronic thermostats with a temperature rating of +/- 0.5 degrees Celsius. Figure 3-3 summarizes available thermostat options, approximates their purchase price, and highlights the corresponding program rebate through this ***takeCHARGE*** program.

**Figure 3-3: Thermostat Rebate Program: Measure Options and Available Rebates[8]**

| Thermostat | Cost of Thermostat[1] | takeCHARGE Rebate |
|---|---|---|
| Programmable | $30-100 | $10 |
| Electronic +/- 0.5°C | $20-40 | $5 |

The participation process of buying a measure, filling out and submitting a rebate form and necessary documentation, and receiving a rebate is nearly identical to other *takeCHARGE* rebate programs; however, retailers play a stronger role in the Thermostat program by partnering with utilities to promote the program and submit forms. The utilities work with the retailers to educate them about eligible thermostat measures, and retailers carry that information forward to customers as potential participants while they are in-store. Further, staff we interviewed described in-store events with retailers, and confirmed they worked with retailers to offer in-store promotions on measures matched by rebates during these events.

Rebates for this program are awarded through on-bill credits, and on-site visits or installation verification by the utility provider are again a possibility that accompanies program participation.

**Overall *takeCHARGE* Program Design – Program Staff Feedback**

Program staff report that they have had instances of repeat customers in some programs, or know of customers who have participated in multiple *takeCHARGE* program offerings, and indicated they believed that was a sign of customer satisfaction with program offerings and design. Others interviewed indicate they have received feedback from customers indicating that they liked various program measures. In particular, feedback about thermostats was positive.

[7] From the *takeCHARGE* Insulation Rebate Program web site. 2/17/2012. Available at: http://takechargenl.ca/residential/insulation-rebates/

[8] From the *takeCHARGE* Thermostat Rebate Program web site. 2/17/2012. Available at: http://takechargenl.ca/residential/thermostat-rebates/

**Program Characteristics going well:**

- Good relations with retailers. The program has the opportunity to provide a business case.
- Programs are pretty robust from a cost-effectiveness standpoint.
- The Windows program is going well, growing from a 10% to 70% share; however, staff claim the program is operating more strongly in urban areas.
- The Insulation program is also operating smoothly. The most popular project is increasing attic insulation from R20 to R 40; however, the "housing boom" in the region has made it more difficult to find available insulation contractors.
- The program [rebate] turnaround time is very good. Customers we surveyed within this evaluation confirm this staff declaration, indicating high levels of satisfaction with rebate credit payment.

**Overall *takeCHARGE* Program Design – Challenges and Barriers**

Program design challenges remain for customers and program partners, according to our staff interviews. One particular challenge heard numerous times in this evaluation was that application forms are a challenge for customers. The program still relies on a paper application, sent in via the mail, and does not currently have a system in place to support on-line applications. One staff detailed a related barrier: that they can't merge consumption data to check program eligibility.

Interviews revealed that program staff is currently working on tackling this barrier. In particular, program representatives are working with trade allies and retailers to do forms on site - and then collect the forms from retailers directly instead of having customers send in forms individually. Representatives also detailed a desire to move towards taking online applications in the near future, and specially, make forms "smarter" by helping customers to pre-populate some of the necessary customer information – such as pre-filling a customer's billing number into the form automatically.

Staff interviewed within this evaluation had the following suggestions for program improvement:

- Increase the range of measures offered; examples provided included lighting and water conservation measures
- Add additional program partners. Example possibilities include municipalities, provincial government, and Builder Associations
- Program promotion needs to be more grass roots. People need more personal convincing. Suspects the program has affected the purchasing of eligible equipment by non-participants, aka spill over

**Retailer / Contractor Participation Process**

Program Staff interviewed for this evaluation agreed that retailer and contractor engagement is a key program component. Newfoundland Power staff, in particular, stressed a focus on creating strong, positive relationships with retailers because they are relying on them to be a program promotion partners and energy conservation educators. They mention that retailers are the entity with the direct-to-customer relationship, and they have witnessed movement among some retailers (primarily big box) integrating the *takeCHARGE* programming options into general merchandising practices. Our interviews confirmed that there are no eligibility requirements, memoranda of understanding, or any formal agreement between retailer and program.

Most participating retailers are chain or independent hardware stores. Interviewed staff listed Home Depot, Costco, and a few branches of Canadian home center stores such as Rona, Kent, Timbermart as ready retailer partners. Home Hardware - independently owned and operated but in a buying coop– has the most store locations working with the programs in the service territories covered by these programs.

Program staff indicates that while there are a good number of retailers and contractors that work with *takeCHARGE* programs, not all who "participate" are active program partners. For example, interviewees indicate that only about one-quarter of the retailers actively partner with the program on a regular basis, including putting program messaging in their marketing efforts. Some partner retailers face additional challenges with putting local programming messages in larger corporate-based marketing materials. Staff had a more difficult time confidently assessing the participation rate of contractors.

**Recruiting and Qualifying Participating Retailers and Contractors**

Staff report using the following methods for retailer and contractor recruitment and/or engagement:

- Recruit directly from directories, through local government offices (for an introduction), via professional organizations or associations (i.e., Homebuilders Association --active only around St Johns) and "driving around"
- Establish partnership with retailers and contractors based primarily on increasing sales
- Demonstrate and educate on the retailer or contractor benefit of offering the rebate to their customers
- [retailer only] Coordinate discounts on the retailer end and in-store booths to promote rebates
- [retailer only] Ask retailers to put up POP materials.
- Educate retailers and contractors on the rebate / paperwork process, and ask them to assist customers. Retailers and contractors have seen the value in helping customers acquire their rebate easily and quickly – it increases customer satisfaction, and aids them in making the sale.

Qualifications for retailer and contractor participation have previously been suggestions rather than requirements. Desired retailer and/or contractor participant characteristics listed by our program staff interviewees include:

- Has a good inventory of program measures available for purchase in their store or to offer to a customer
- Open to program promotion via their customer conversations, their flyers, and through other marketing materials
- Considers offering a discounted measure price to get the best value for our customers that we can
- Has a solid company or store reputation (a.k.a., mindedness for customer service)

Several interviewed staff confirmed that – especially in connection with the ENERGY STAR Window Rebate program, there were spiffs[9] available in Newfoundland Power's and Hydro's service territories that specifically created a successful retailer/ program partnership in previous years. The Utilities asked retailers to fill in rebate forms in the store and submit, rather than wait for customers to fill out, and in return, sales staff was provided a $10 spiff for each rebate application submitted. Staff shared other stories of retailer engagement with program promotion and incentives have had a measureable impact in other program areas, as well – such as double rebates increasing program and rebate claim volume.

**Retailer and Contractor Barriers:**

Staff was able to name some specific barriers that exist in recruiting retailers and/or contractors to work with and help promote the program. Factors they named as barriers for area retailers or contractors include:

- Lack of staff time
- Lack of understanding of customer and business benefits
- Customer pushback over the application process

[9] A spiff is defined as a bonus or other compensation given to retail salespeople for promoting the products of a particular manufacturer.

- Some retailers and/or contractors view extra program promotion or customer assistance (i.e., filling out rebate applications for or with a customer) as outside of their core business.
- Some confusion still exists over measures and/or program qualifications. For example, interviews suggested the confusion that remained in the market between low voltage v. line voltage thermostat products. The *takeCHARGE* program only supports the latter, which are used to control electric baseboard.
- Some retail hardware stores are feeling "the boom" and are doing well with Do-It-Yourselfers. Incentives and/or business opportunities are not strong enough with the program to take it on.

Some staff suggests that -- in order to deal with these barriers --there is an opportunity for more one-on-one contact with retailers and builders to persuade them to provide more information to customers, and for them to acquire the necessary education to increase their awareness of program offers.

## 3.2 Program Participation and Achievements

Program staff we interviewed within this evaluation consistently identified that a main, overarching objective is to deliver on established energy savings targets. They reported that they rely on, and benchmark off of the annual energy savings goals that are established through the program within the context of the Five Year Plan. They further indicated that annual goals get broken down to annual quotas for various measures, and that goals are met in some years, some not.

*takeCHARGE* program staff detailed goals outside of participation totals and energy savings for 2013, as well – both in our process evaluation interviews and through program documentation. Within our interviews, they confirmed that meeting quantitative energy savings goals was accomplished through encouraging both business and residential customer participation, and that educating people overall about energy conservation possibilities was an overall program goal. They also mentioned that named developing relationships with participating trade allies, retailers, etc., and expanding market penetration of energy efficiency measures and programs is a key program priority.

A majority of these additional program objectives connected to increasing the use of specific marketing channels – such as the program's web site – to educate customers, drive participation, and / or provide information to make decisions or claim their rebate. Section 3.3 will explore the marketing channels the program staff utilized in order to reach out to their customers, and report on customers' feedback about program marketing that was collected during this evaluation.

## 3.3 Program Marketing and Outreach

**Marketing and Outreach – General:**

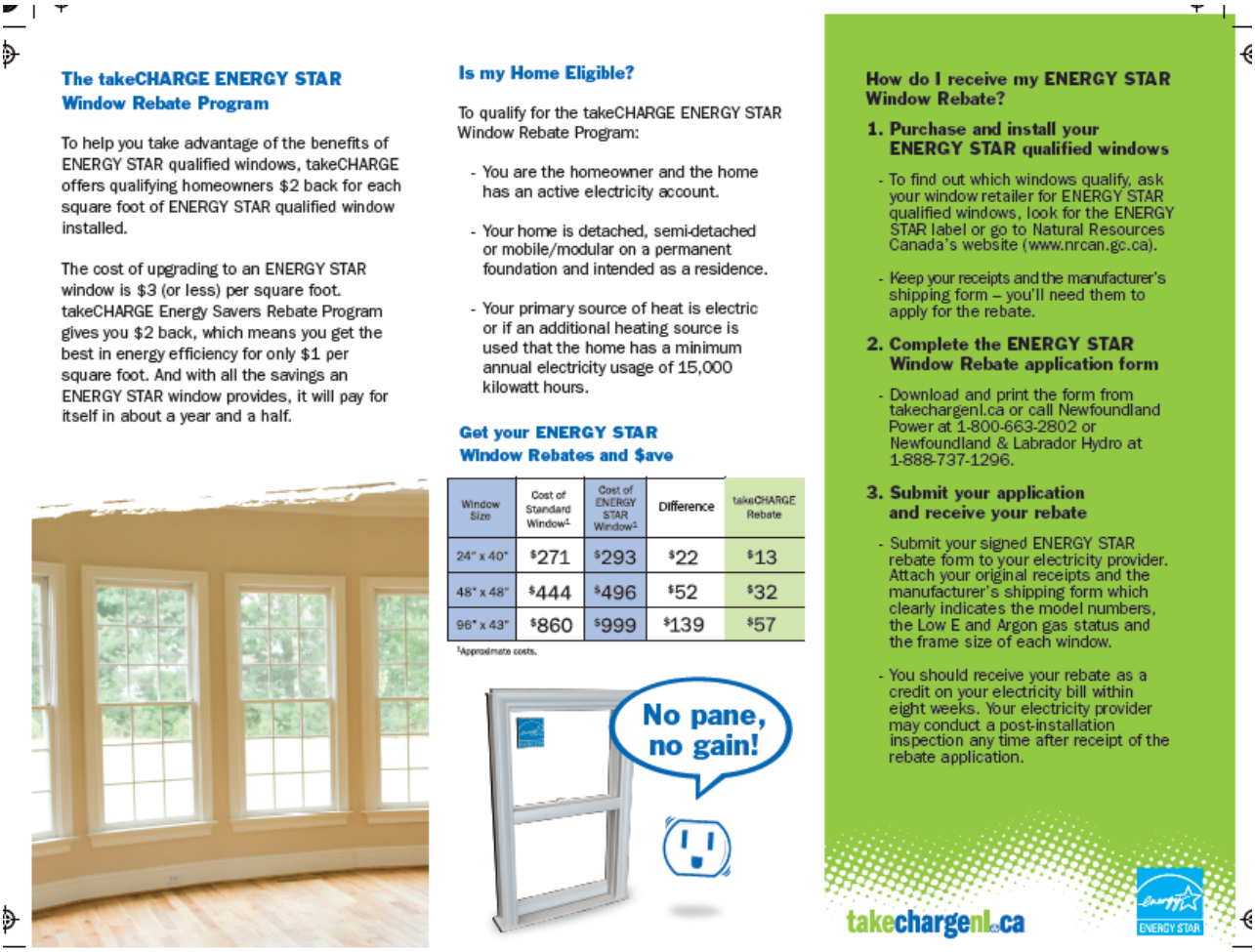
Many of the program staff we interviewed indicated that program marketing to Newfoundland Power and Hydro customers happened on a mass, not targeted, scale. Those interviewed named marketing channels such as TV, radio, print ads, and bill stuffers; program contacts further provided program brochures and rebate applications for our evaluation review. Interviewees indicated mass marketing channels are favoured because of the territory characteristics; in particular, they are often trying to reach small pockets of customers within a "huge territory". Still others mentioned that primary points of customer contact are the call center and web site, and the program used and had social media goals for the year. The DNV GL team reviewed the *takeCHARGE* web site and verified the program's Twitter and Facebook accounts, respectively.

About half of the staff we interviewed volunteered that there was likely room for targeted *takeCHARGE* program marketing, in particular, one respondent offered the idea that energy consumption on energy bills could be used to ID high energy users about program offerings and measure installation

opportunities. Others noted that while program messaging emphasizing a broad range of program benefits in the past, marketing is currently focused more on monetary rewards of program participation. Said one interviewee, "*In our market, money is the key motivator to inspire customer action. Other people in other markets may have stronger environmental motivations*." DNV GL's review of the marketing brochures provided by the program confirms that the messaging emphasize is on bottom line, pocketbook savings, such as the "*Get $300 Back!"* call-out message in Figure 3-4.

**Figure 3-4: *takeCHARGE* Window Rebate Program Marketing Brochure – Side One.**

**Figure 3-5: *takeCHARGE* Window Rebate Program Marketing Brochure – Side Two.**



**The takeCHARGE ENERGY STAR Window Rebate Program**

To help you take advantage of the benefits of ENERGY STAR qualified windows, takeCHARGE offers qualifying homeowners $2 back for each square foot of ENERGY STAR qualified window installed.

The cost of upgrading to an ENERGY STAR window is $3 (or less) per square foot. takeCHARGE Energy Savers Rebate Program gives you $2 back, which means you get the best in energy efficiency for only $1 per square foot. And with all the savings an ENERGY STAR window provides, it will pay for itself in about a year and a half.

**Is my Home Eligible?**

To qualify for the takeCHARGE ENERGY STAR Window Rebate Program:

- You are the homeowner and the home has an active electricity account.
- Your home is detached, semi-detached or mobile/modular on a permanent foundation and intended as a residence.
- Your primary source of heat is electric or if an additional heating source is used that the home has a minimum annual electricity usage of 15,000 kilowatt hours.

**Get your ENERGY STAR Window Rebates and $ave**

| Window Size | Cost of Standard Window[1] | Cost of ENERGY STAR Window[1] | Difference | takeCHARGE Rebate |
|---|---|---|---|---|
| 24" x 40" | $271 | $293 | $22 | $13 |
| 48" x 48" | $444 | $496 | $52 | $32 |
| 96" x 43" | $860 | $999 | $139 | $57 |

[1]Approximate costs.



**How do I receive my ENERGY STAR Window Rebate?**

1. **Purchase and install your ENERGY STAR qualified windows**
   - To find out which windows qualify, ask your window retailer for ENERGY STAR qualified windows, look for the ENERGY STAR label or go to Natural Resources Canada's website (www.nrcan.gc.ca).
   - Keep your receipts and the manufacturer's shipping form – you'll need them to apply for the rebate.
2. **Complete the ENERGY STAR Window Rebate application form**
   - Download and print the form from takechargenl.ca or call Newfoundland Power at 1-800-663-2802 or Newfoundland & Labrador Hydro at 1-888-737-1296.
3. **Submit your application and receive your rebate**
   - Submit your signed ENERGY STAR rebate form to your electricity provider. Attach your original receipts and the manufacturer's shipping form which clearly indicates the model numbers, the Low E and Argon gas status and the frame size of each window.
   - You should receive your rebate as a credit on your electricity bill within eight weeks. Your electricity provider may conduct a post-installation inspection any time after receipt of the rebate application.

takechargenl.ca

Opinions among program staff we interviewed were mixed on whether this was the "right" direction for marketing. Some interviewees indicated displeasure that the energy efficiency/conservation messaging is weak, and reported hearing this feedback from customers, as well.

Regardless of what they thought of program marketing overall, program staff we interviewed had clear comments about what is working well – and what is not – within the program marketing efforts. Their sentiments are summarized in Table 3-1.

**Table 3-1: Summary Program Staff Marketing Feedback**

| Going well | What can be improved? |
|---|---|
| • Mass media marketing campaigns are good.<br>• In-person events in the communities. | • Communicate financial benefits even more clearly (incl. cost reduction of measures through program participation).<br>• Tailor marketing and services to rural customers.<br>• Need more direct contact with customers and retailers: more direct mail, more events, community champions, testimonials. |

**Marketing and Outreach – via Program Partners**

As described previously in this report, the program's design and process choices choose to educate and partner with retailers and contractors to market the program. Where possible, utility staff reach out to, promote, and train retailers and contractors in order to build program awareness, and they encourage these program partners to promote program rebates through their own flyers, in-store promotions, and through other marketing channels they utilize.

Staff we interviewed confirmed that some retailers (big box) have moved past marketing basics towards integrating programming into general merchandising practices. For example, they've added their own discounts, incentives, or rebates in some instances to *takeCHARGE* rebates, and then publicized the rebate programs in their own flyers. Staff went on to indicate they have had less success with similar Window retailers partners, but were unable to identify why this partnership is less robust.

Our retailer survey within this evaluation suggests that the retailer-program marketing connection is slightly stronger within the Avalon retailers, than among retailers within Hydro. Nearly all – or 94% -- of the retailers confirm they are doing more marketing of program products since 2009, compared to only 82% of retailers in Rest of Island and Labrador who make the same claim.

**Table 3-2: Retailer Response on their Marketing of Products Since 2009**

| Retailer Response on Marketing | Total | Avalon | Rest of Island/Labrador |
|---|---|---|---|
| **More Frequently** | **91%** | 94% | 82% |
| **Less Frequenty** | **0%** | 0% | 0% |
| **About the Same** | **9%** | 5% | 18% |

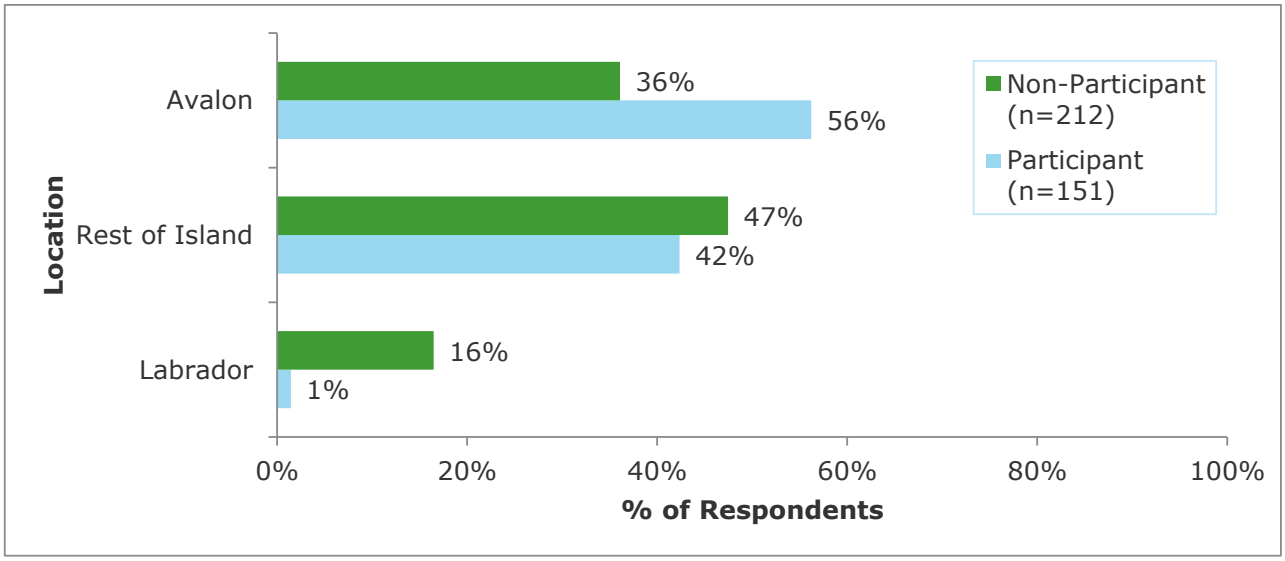
# 4 CUSTOMER SURVEY FINDINGS

This section presents the findings from the participant and non-participant customer surveys.

## 4.1 Characterization of Program Participants and Non-participants

Figure 4-1 presents the breakout of participating and non-participating customers surveyed in the Newfoundland Power and Hydro service areas that completed the *takeCHARGE* survey. Whereas most participant respondents came from Avalon, most non-participant respondents were from the "rest of island" (i.e., outside Avalon and Labrador).

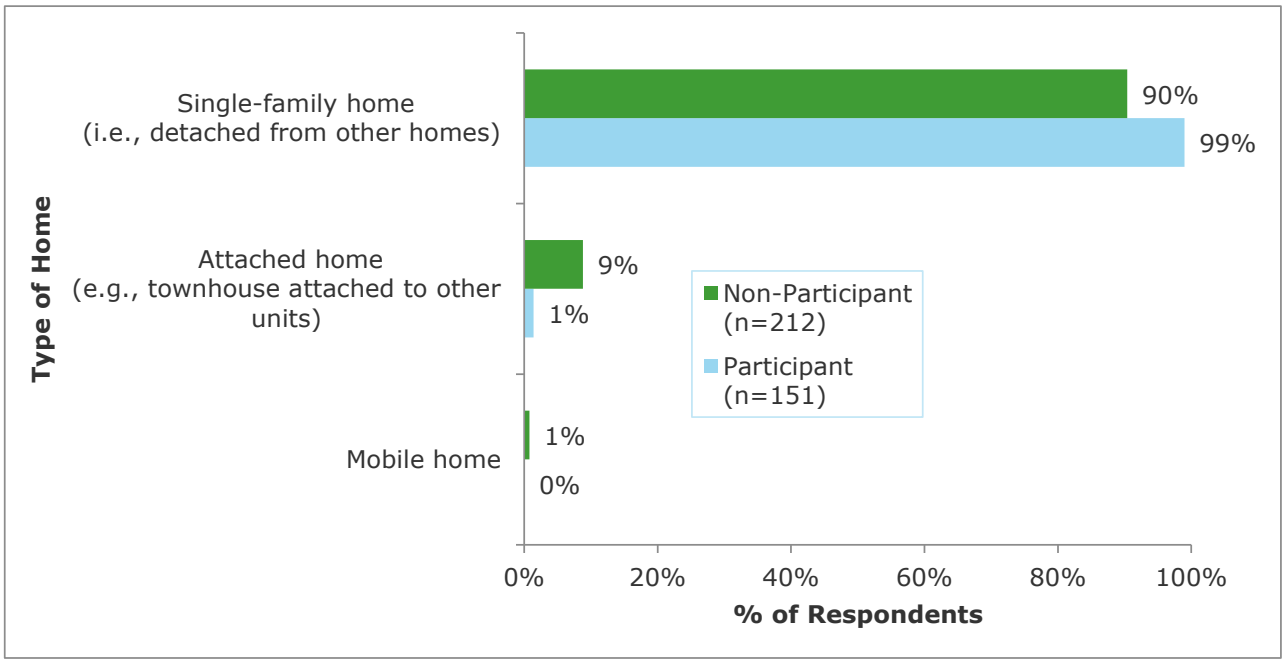
**Figure 4-1: Location Breakdown of Survey Respondents**




**May not sum to total due to rounding.*

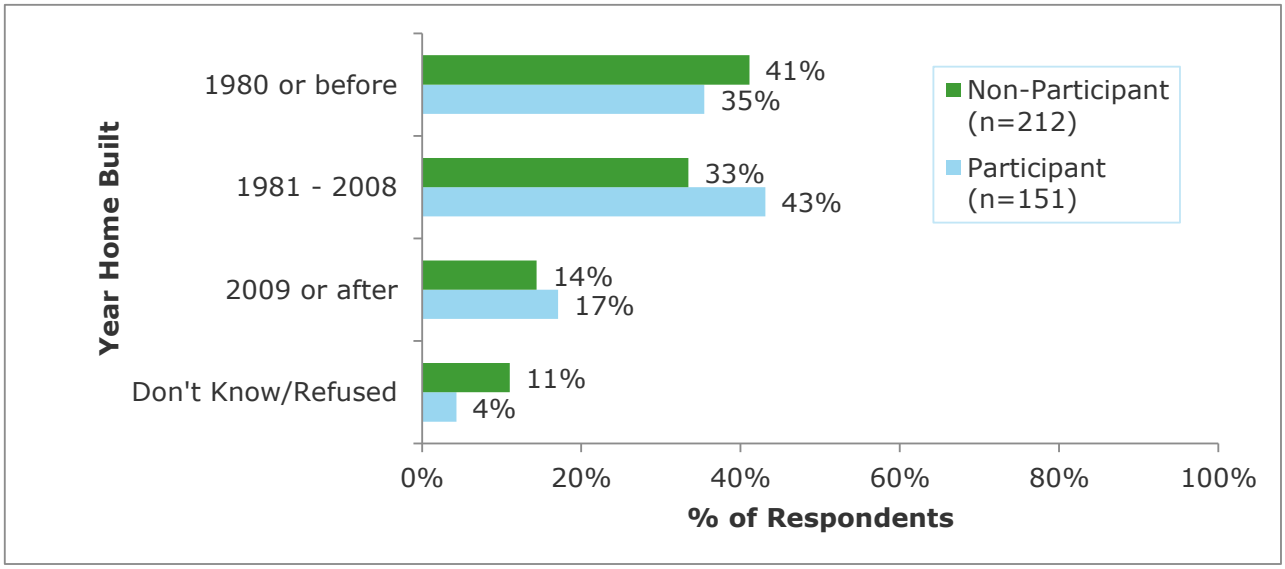
Figure 4-2 through Figure 4-6 displays additional demographic characteristics of the sample of participating and non-participating survey respondents. The figures show that *takeCHARGE* program participants and non-participants were fairly similar in terms of home type, age of home, size of home, and number of floors in the home, and income.

**Figure 4-2: Type of Home**



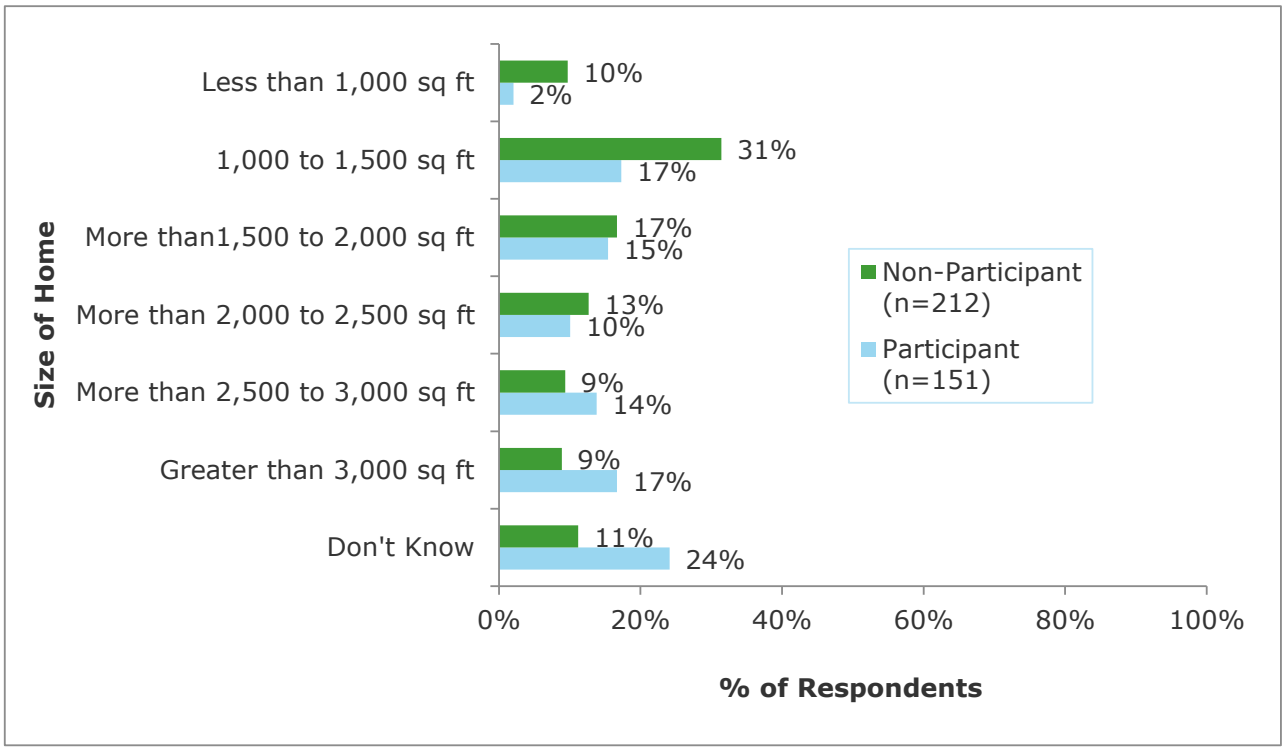

**May not sum to total due to rounding.*

**Figure 4-3: Year Home Built**



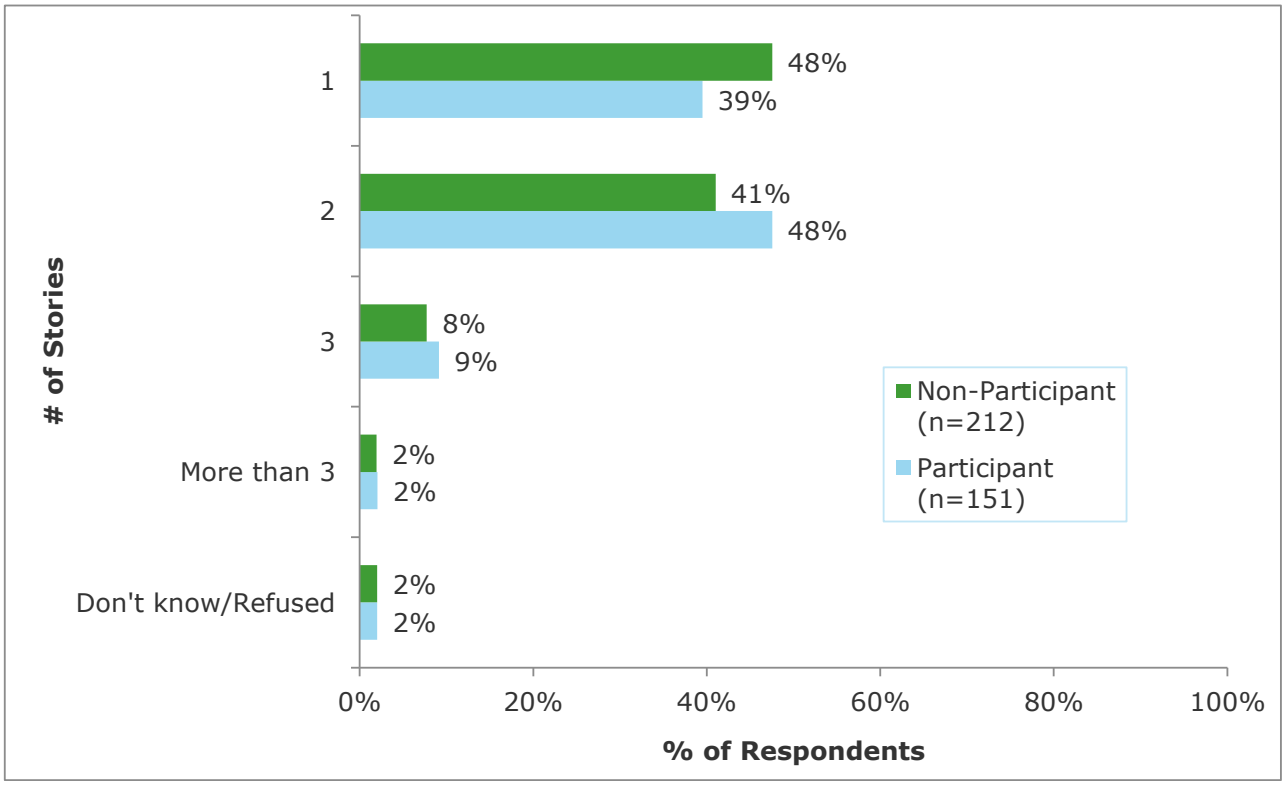

**May not sum to total due to rounding.*

**Figure 4-4: Size of Home**



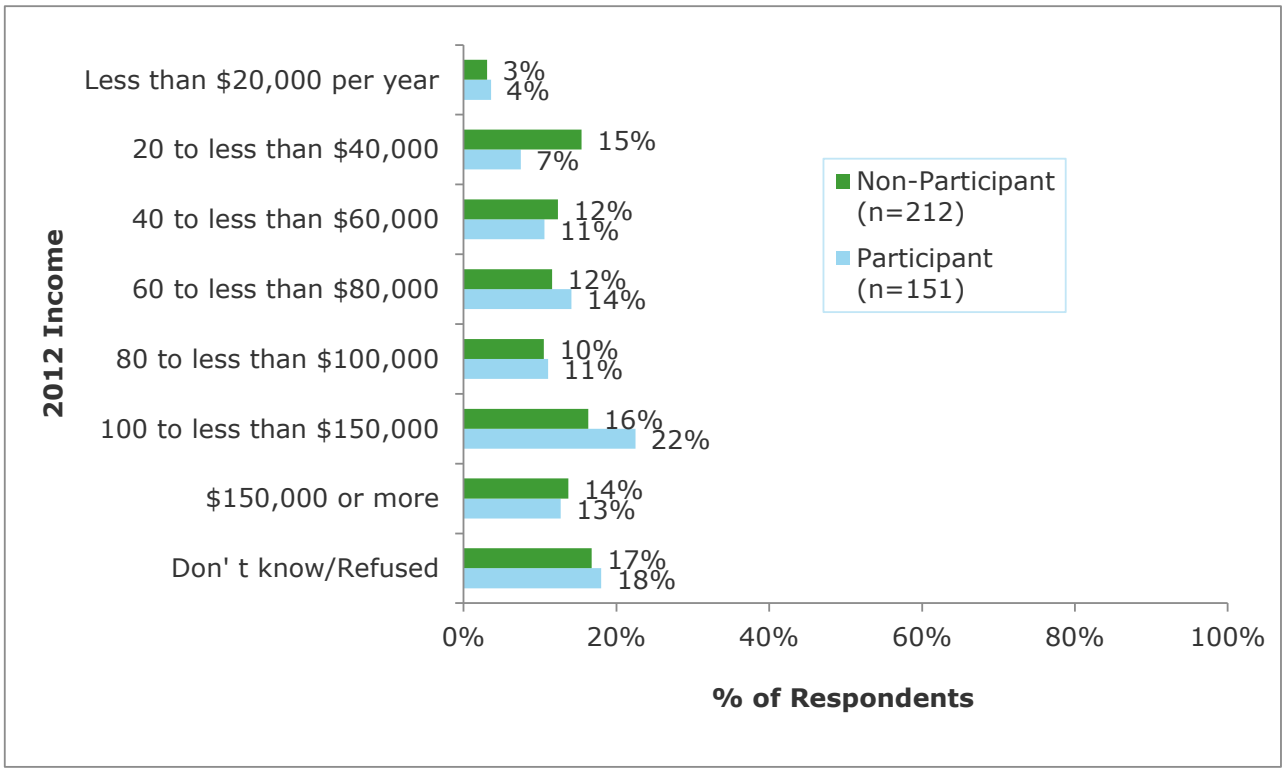

**May not sum to total due to rounding.*

**Figure 4-5: Number of Stories in Home**




**May not sum to total due to rounding.*

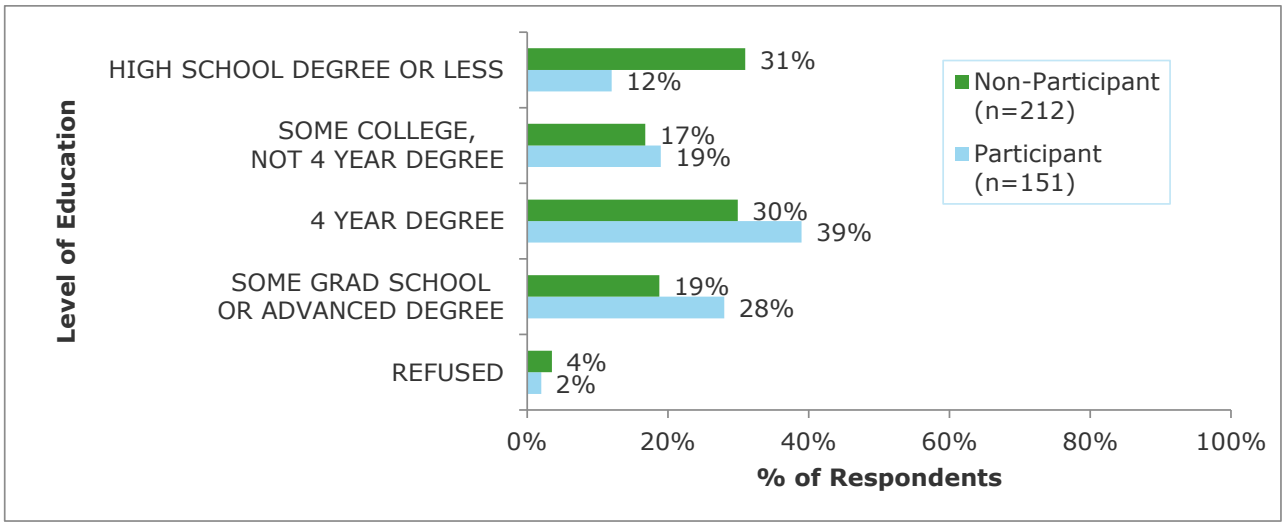
**Figure 4-6: 2012 Income**




**May not sum to total due to rounding.*

Figure 4-7 shows a variation between levels of education between participants and non-participants who completed the survey. Whereas more non-participant respondents had a high school degree or less than participant customers (31% vs. 12%), more participant respondents had a four year college degree or experience with graduate school than non-participant consumers (67% vs. 49%).

**Figure 4-7: Level of Education**

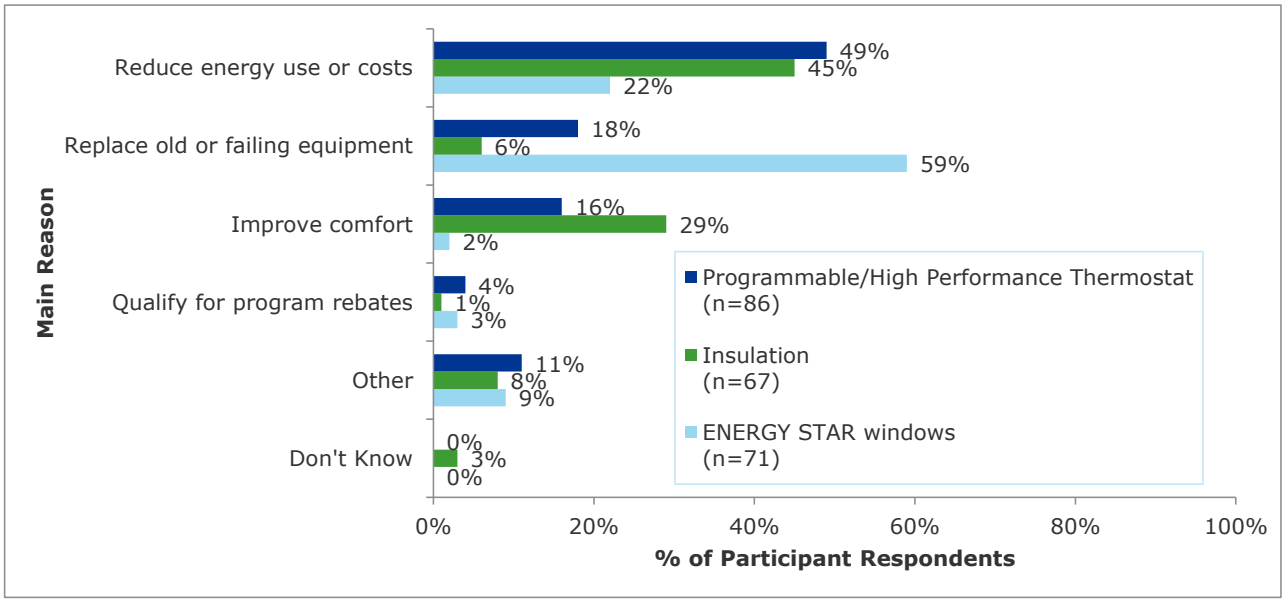



**May not sum to total due to rounding.*

## 4.2 Customer Motivation for Participation

Participant survey respondents were asked for the main reason they chose to install one or more program measures. Figure 4-8 shows the primary reason for almost half of participants who installed insulation (45%) and thermostats (49%) was to reduce energy or costs. Almost two-thirds of participants who installed ENERGY STAR windows (59%) indicate the primary driver was to replace old or failing equipment.

**Figure 4-8: Main Reason for Installing Program Measures***



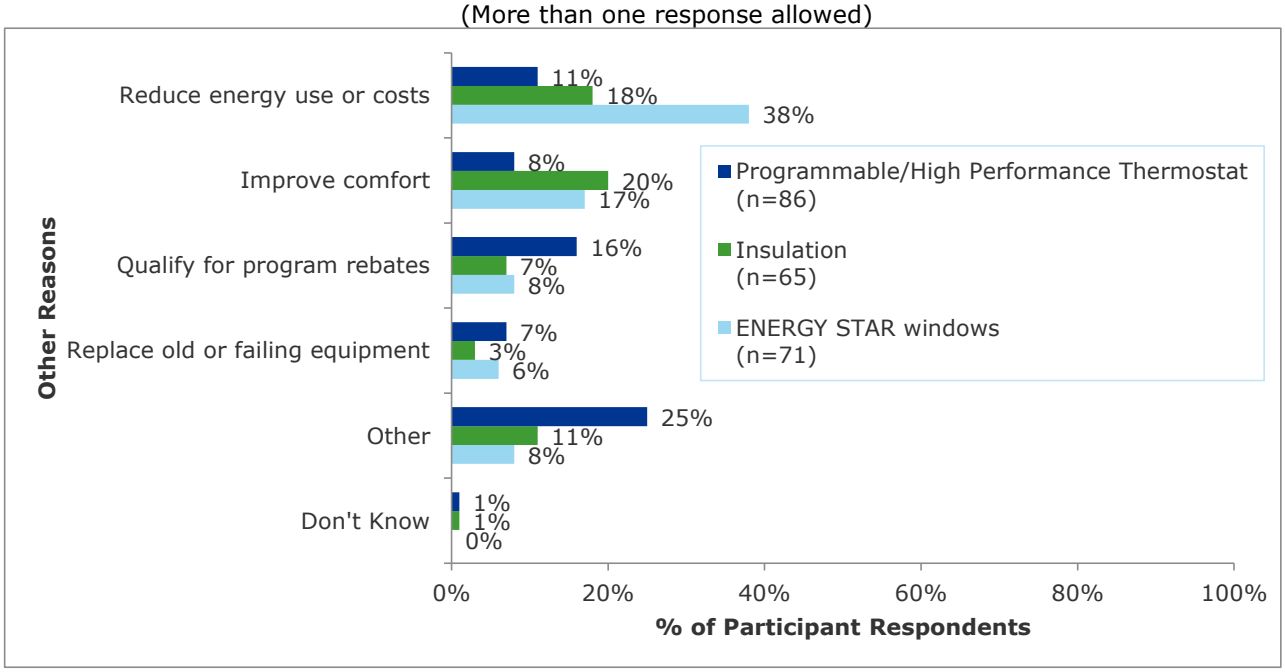

**To a lesser extent, additional primary reasons for installing program measures include: Add or reconfigure living space; Increase the value of the home; and Repair or replace exterior of the home.*

***May not sum to total due to rounding.*

Besides asking for the main reason participant survey respondents installed programs measures, the survey also asked participants if there were additional factors that influenced them to have program measures installed. Figure 4-9 shows that many of the other reasons participants had measures installed aligned with the primary reasons shown cited above with 1) reducing energy or costs; 2) improving comfort; 3) qualifying for program rebates and 4) replacing old or failing equipment being noted as either a primary or secondary reason for program measures.

**Figure 4-9: Other Reasons for Installing Program Measures***

(More than one response allowed)

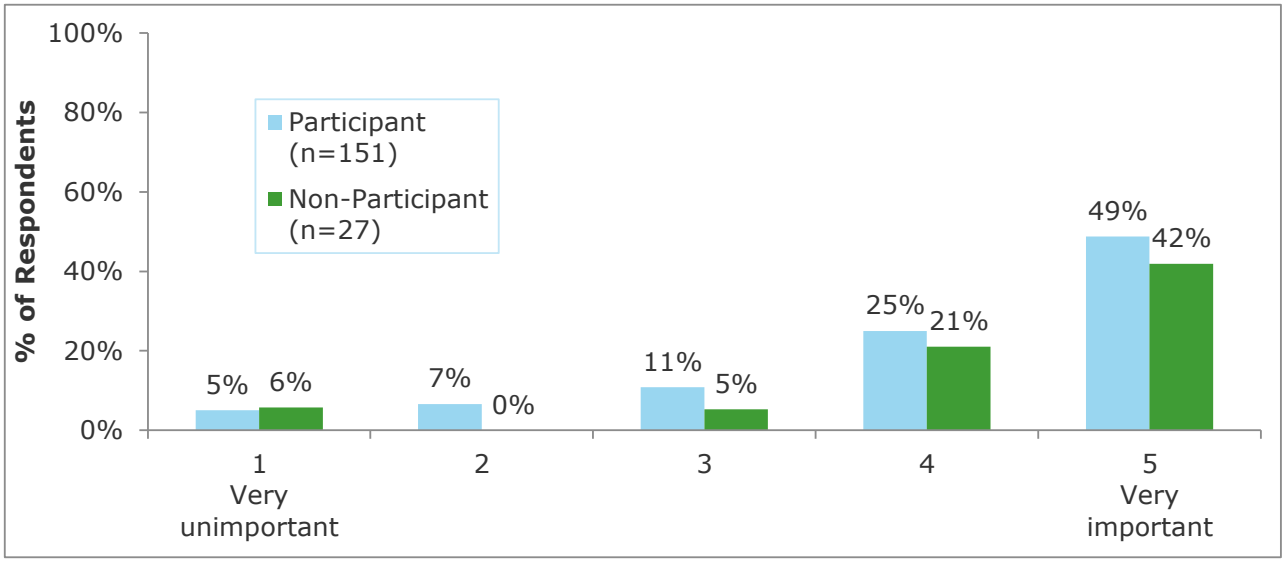



*To a lesser extent, additional reasons for installing program measures include: Add or reconfigure living space; Increase the value of the home; and Repair or replace exterior of the home.

**May not sum to total due to rounding.

Before participating, knowing the amount of insulation rebate offered by the *takeCHARGE* program was very important for 49 percent of participants and somewhat important for 25 percent of the participants. Non-participant survey respondents who purchased insulation since 2009 and indicated being aware of the *takeCHARGE* program were also asked how important it is to know the amount of insulation rebate they would be eligible under the program. Figure 4-10 shows that almost three-quarters of participants (74%) and almost two-thirds of non-participants (63%) consider it either very or somewhat important to know the rebate amount offered by the insulation program.

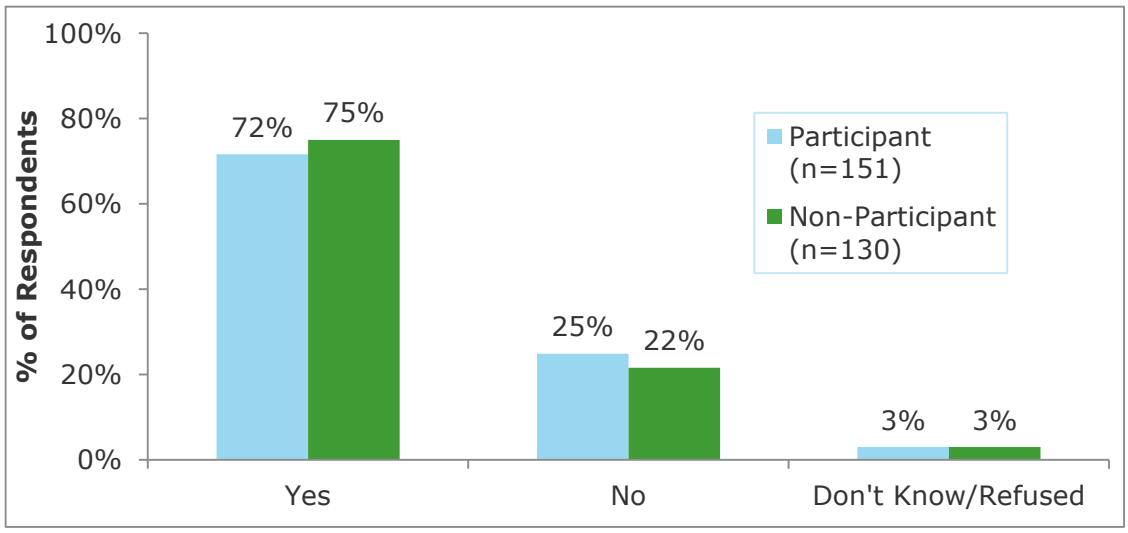
**Figure 4-10: Importance of Knowing Amount of Insulation Rebate *takeCHARGE* Program Offers**




*May not sum to total due to rounding.

Both participant and non-participant survey respondents were asked if they were knowledgeable about the amount of the insulation rebate if they would be more likely to participate in the program. Figure 4-11 shows that about three-quarters of participants (72%) and non-participants (75%) report being more likely to make use of the insulation program if they were aware of the rebate amount offered.

**Figure 4-11: Increased Likeliness to Participate in *takeCHARGE* Program If Know Rebate Amount**



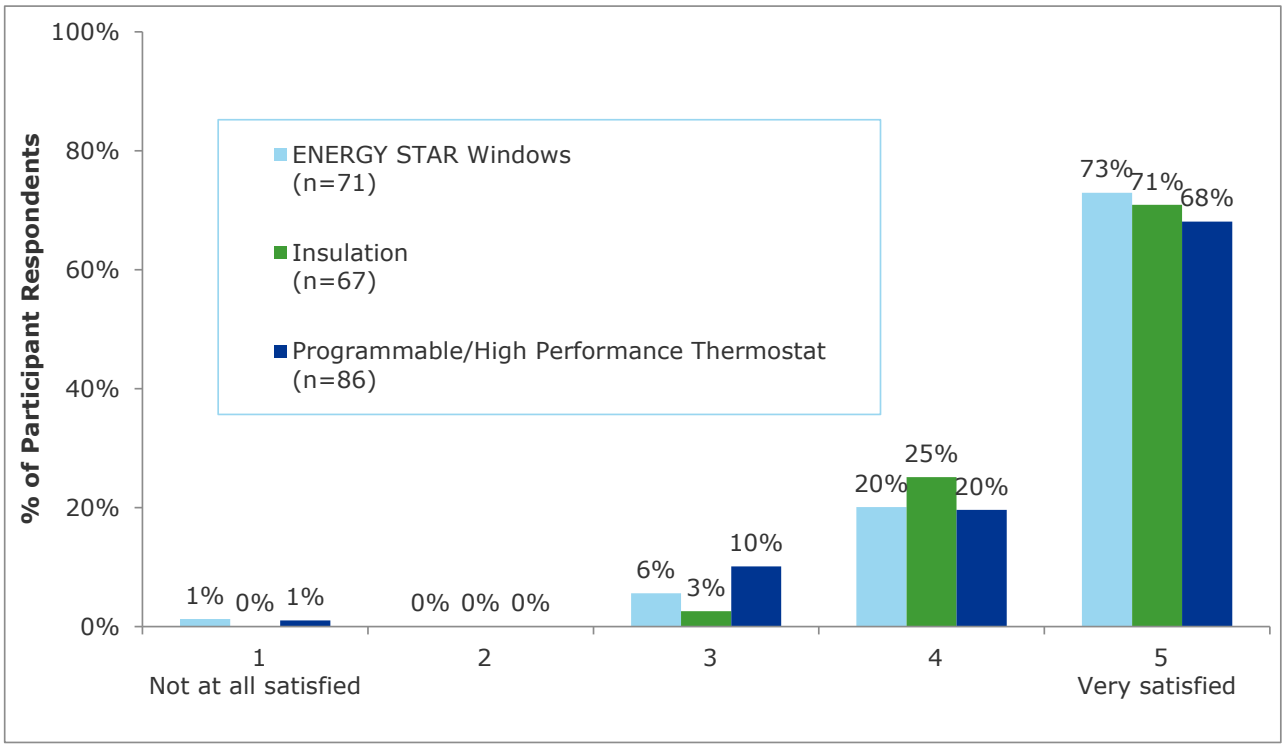

**May not sum to total due to rounding.*

## 4.3 Customer Program Satisfaction

Participating survey respondents having one or more program measures installed were asked how satisfied or dissatisfied they were with the program measure(s) they had installed using a five-point scale where five represented "very satisfied" and one represented "very dissatisfied."

Figure 4-12 shows the large majority of participants were satisfied with all program measures installed, indicated by the majority of participant customers providing a rating of 4 or 5 for the installation of ENERGY STAR windows (93%), insulation (96%) and programmable/high performance thermostats (88%). It should also be noted that over two-thirds of participants reported being "very satisfied" for all the program measures installed.

**Figure 4-12: Satisfaction with Program Measure Installed**




**May not sum to total due to rounding.*

Participating survey respondents who said they were dissatisfied (i.e., provided a rating of 1, 2 or 3) with the program measure(s) they had installed were asked why they were dissatisfied. Table 4-1 shows that most complaints had to do with the programmable/high performance thermostats being deemed expensive to purchase, even with the program rebate.

**Table 4-1: Reasons for Being Dissatisfied with Program Measure Installed**

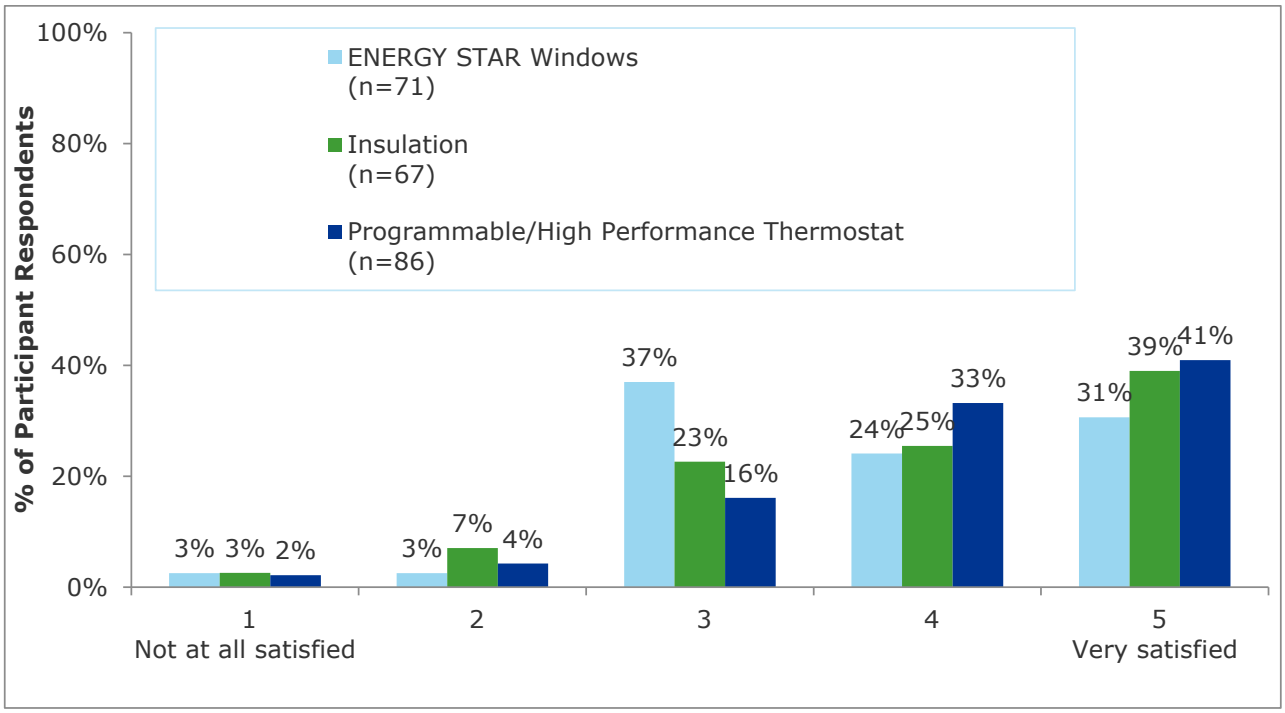
(More than one response allowed)

| Program Measure | Reason for Dissatisfaction | # of Times Reason Stated |
|---|---|---|
| ENERGY STAR WINDOWS | Had issue with window leaking | 2 |
| | Window(s) hard to open/shut | 1 |
| | Other | 2 |
| | | |
| Insulation | The area was over insulated | 1 |
| | Other | 1 |
| | | |
| Programmable/ High Performance Thermostats | Desire for better rebate | 15 |
| | This equipment was expensive | 2 |
| | Had to contact utility to remind them of rebate | 1 |
| | Other | 2 |

Participating survey respondents having one or more program measures installed were asked about their satisfaction with the rebate amount offered by the *takeCHARGE* program. Figure 4-13 shows that while the majority of participants expressed being satisfied, a noticeable number report dissatisfaction with the amount of rebate offered by the program, ranging from 22% for programmable/high performance thermostats to 43% for ENERGY STAR windows. The only significant difference found between participant ratings by location (i.e., Avalon, Rest of island and Labrador) for program measures was for

insulation. Participants in Labrador were significantly more likely to be satisfied with the rebate amount for insulation compared to Avalon and the rest of island. However it is important to keep in mind that a low number of participants from Labrador (n=2) responded to the survey.

**Figure 4-13: Satisfaction with Rebate Amount**




**May not sum to total due to rounding.*

Participating survey respondents who indicated they were dissatisfied with the amount of the program rebate were asked why they were displeased. Table 4-2 shows that most complaints had to do with a desire for higher rebate amount for ENERGY STAR windows and insulation.

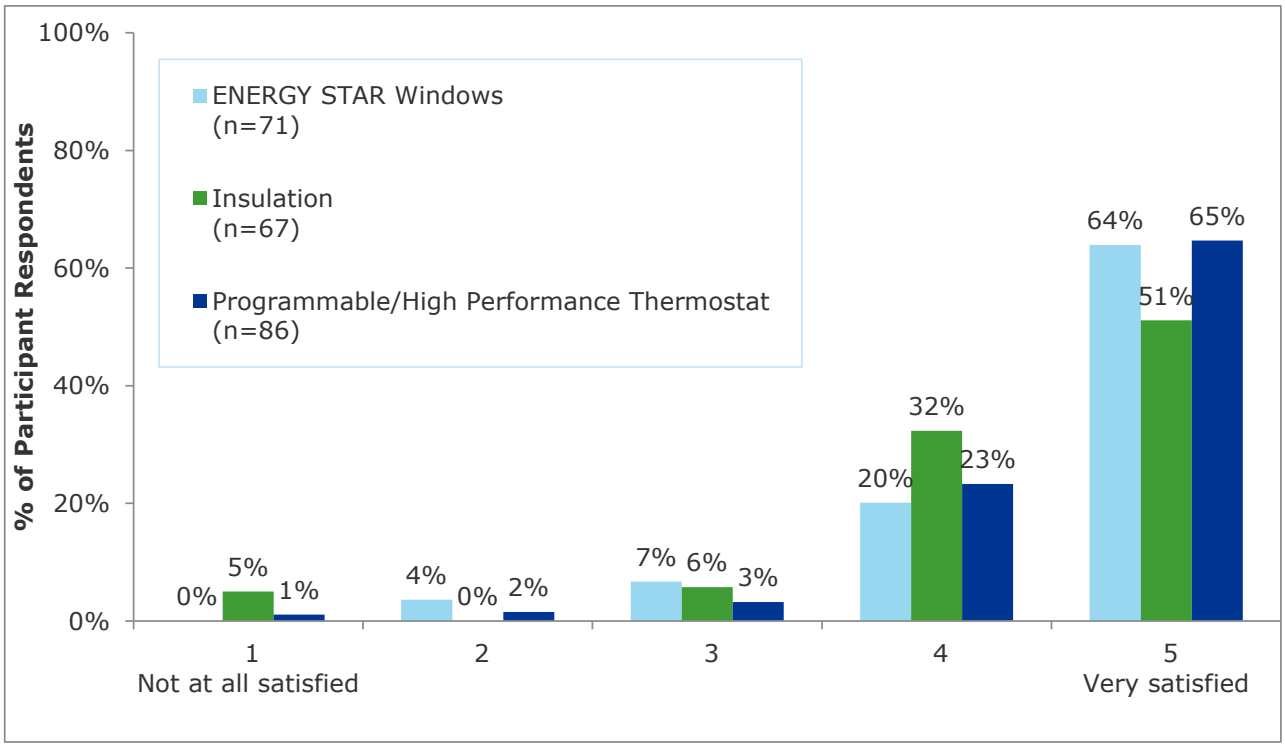
**Table 4-2: Reasons for Being Dissatisfied with Rebate Amount**

(More than one response allowed)

| Program Measure | Reason for Dissatisfaction | # of Times Reason Stated |
|---|---|---|
| ENERGY STAR WINDOWS | Desire for better rebate | 29 |
| | Window(s) expensive to replace | 1 |
| | Never received rebate | 1 |
| | | |
| Insulation | Desire for better rebate | 13 |
| | Did not meet deadline to receive rebate | 1 |
| | Not aware of program until after selecting insulation | 1 |
| | Other | 6 |
| | | |
| Programmable/ High Performance Thermostats | Took too long to receive rebate | 3 |
| | Other | 2 |

Participating survey respondents having one or more program measures installed were asked about their satisfaction regarding the timeliness of the rebate payment. Figure 4-14 shows the large majority of participants were satisfied with amount of time it took to receive the rebate, indicated by the majority of survey respondents providing a rating of 4 or 5 for the perceived timeliness it took to receive their rebate. It should also be noted that over half of participant customers reported being "very satisfied" for the length of time to receive their rebate across all three measure programs.

**Figure 4-14: Satisfaction with Timeliness to Receive Rebate**




****May not sum to total due to rounding.*

Participating survey respondents who indicated they were dissatisfied with the amount of time it took to receive their program rebate(s) were asked why they were unhappy. Table 4-3 shows that most feedback provided a general commentary regarding the desire to receive the rebates more quickly.

**Table 4-3: Reasons for Being Dissatisfied with Timeliness to Receive Rebate**

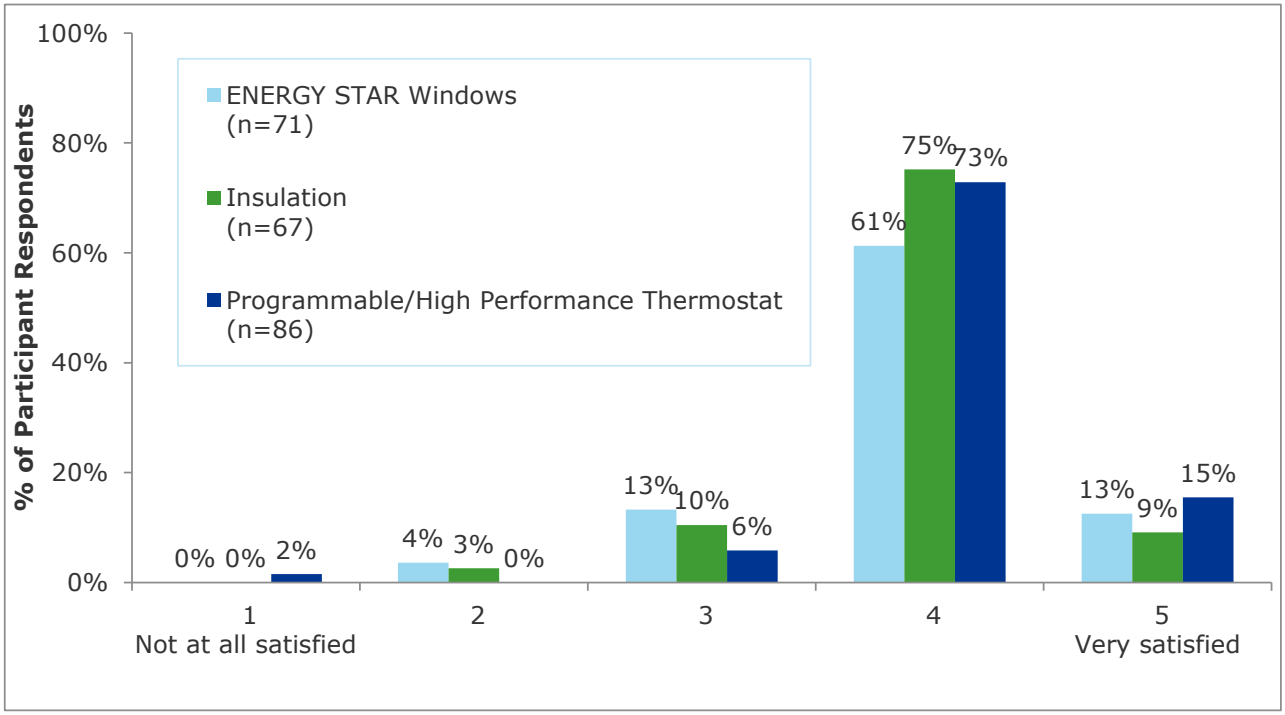
(More than one response allowed)

| Program Measure | Reason for Dissatisfaction | # of Times Reason Stated |
|---|---|---|
| ENERGY STAR Windows | Took too long to receive rebate | 3 |
| | Paperwork was too time consuming to fill out | 2 |
| | Other | 1 |
| | | |
| Insulation | Took too long to receive rebate | 6 |
| | | |
| Programmable/ High Performance Thermostats | Paperwork was too time consuming to fill out | 2 |
| | Desire for online application | 2 |
| | Other | 1 |

Participating survey respondents having one or more program measures installed were asked about their satisfaction with the application forms and other paperwork associated with the rebate. Figure 4-15 shows that most participants did not have a negative experience generating the paperwork required to

receive the rebate for the ENERGY STAR window, insulation and programmable/high performance thermostats thermostat programs.

**Figure 4-15: Satisfaction with Rebate Application Form/Paperwork**




**May not sum to total due to rounding.*

Participating survey respondents who indicated they were dissatisfied with their experience with the rebate application form/paperwork were asked the reason(s) for being displeased. Table 4-4 shows that for ENERGY STAR windows and insulation that most comments had to do with the application/paperwork being overly cumbersome and complicated to complete.

It is interesting to note that in addition to providing feedback on the rebate application, a number of participating survey respondents (n=7) replied to this question by noting they were challenged working with their new thermostats for reasons that include:

- "Not sure if I have the thermostat set up right."
- "Do not find the thermostat very easy to program or make changes."
- "Very difficult to adjust the thermometers – the booklet does not give enough information and I had to call someone for help to set up the thermostat."
- "The heat output does not seem to match thermometer setting."

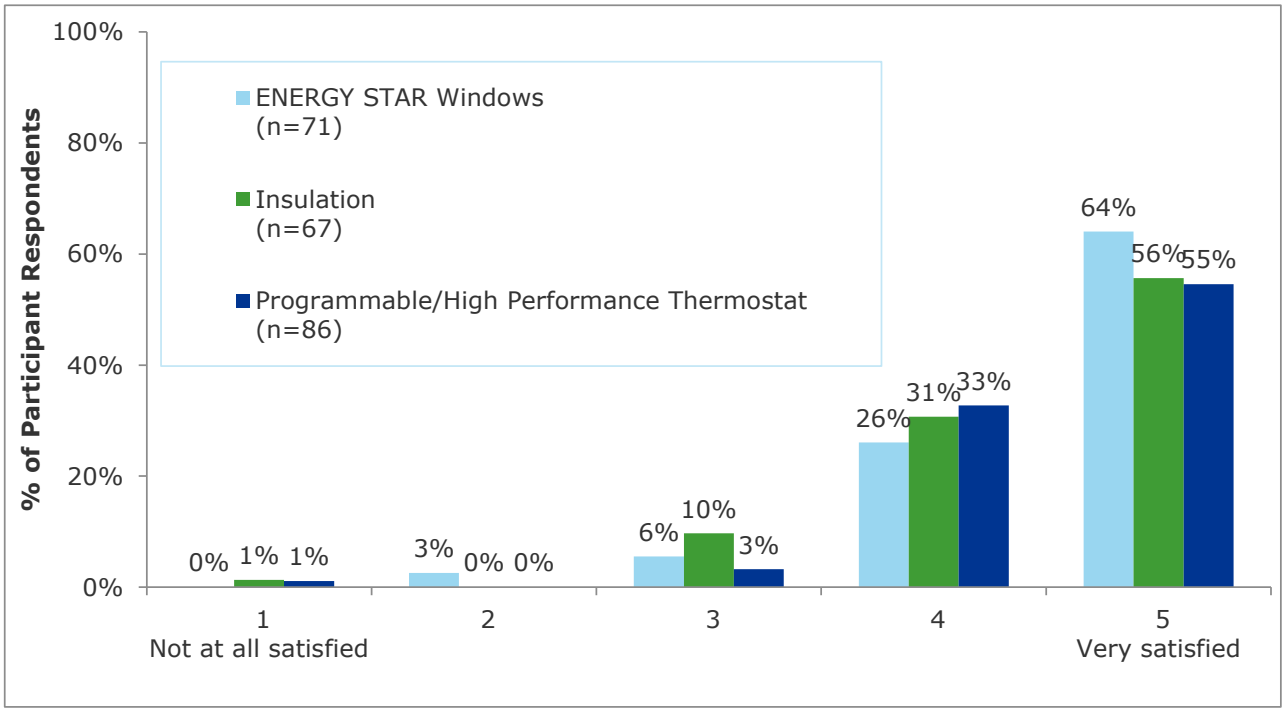
**Table 4-4: Reasons for Being Dissatisfied with Rebate Application Form/Paperwork**

(More than one response allowed)

| Program Measure | Reason for Dissatisfaction | # of Times Reason Stated |
|---|---|---|
| ENERGY STAR WINDOWS | Paperwork was too time consuming to fill out | 3 |
| | Paperwork was too complicated to fill out | 2 |
| | Desire for online application | 2 |
| | Contractor did not supply necessary paperwork | 1 |
| | Other | 3 |
| | | |
| Insulation | Paperwork was too time consuming to fill out | 1 |
| | Paperwork was too complicated to fill out | 1 |
| | Frustrated that paperwork was sent back because deemed not filled out properly | 1 |
| | Other | 5 |
| | | |
| Programmable/ High Performance Thermostats | Having difficulty working with new thermostat(s) | 7 |
| | Paperwork was too complicated to fill out | 3 |
| | Other | 2 |

Participating survey respondents having one or more program measures installed were asked about their satisfaction with the contractor or retailer they contacted. Figure 4-16 shows the large majority of participants were pleased with the interaction they had with their contractor of retailer, indicated by the majority of survey respondents providing a satisfaction rating of 4 or 5. It should also be noted that over half of participant customers reported being "very satisfied" with their interactions with contractors/retailers across all three measure programs.

**Figure 4-16: Satisfaction with Contractor/Retailer**




**May not sum to total due to rounding.*

Participating survey respondents who indicated they were dissatisfied with their contractor/retailer were asked to indicate why they were dissatisfied. Table 4-5 shows customers who did not have a positive interaction with their contractor/retailer provide many different reasons for their discontent.

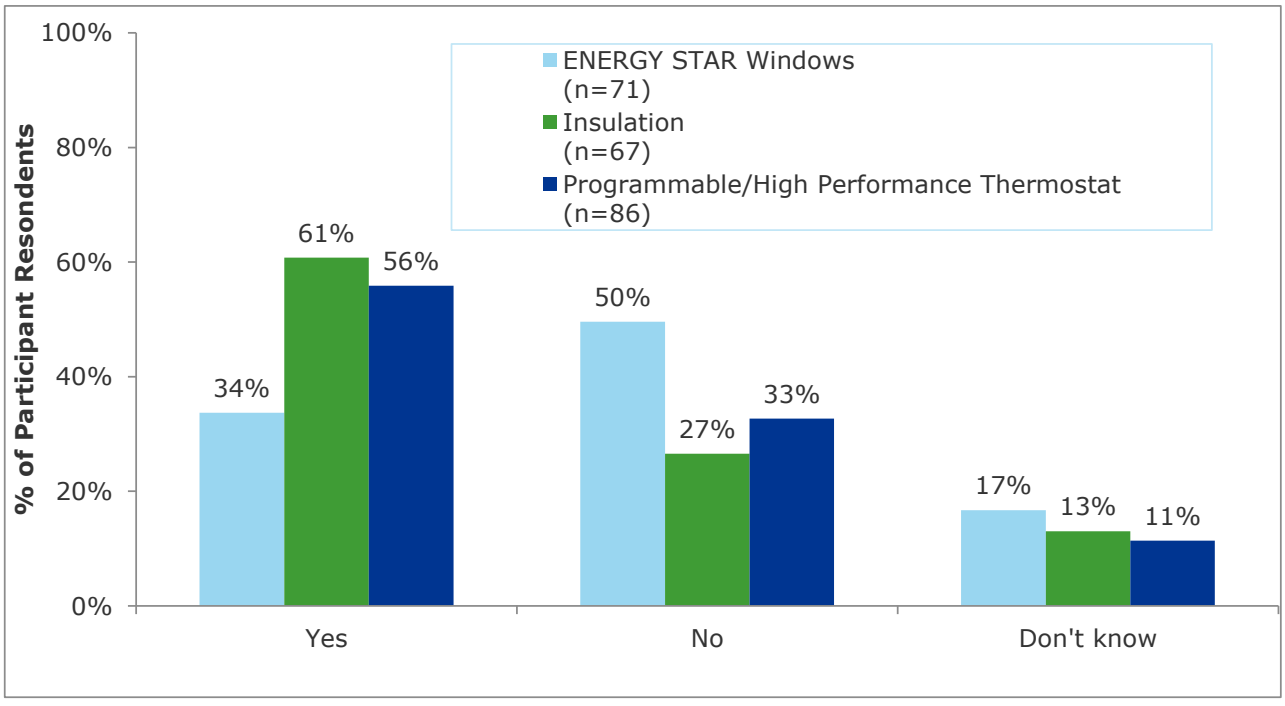
**Table 4-5: Reasons for Being Dissatisfied with Contractor/Retailer**

(More than one response allowed)

| Program Measure | Reason for Dissatisfaction | # of Times Reason Stated |
|---|---|---|
| ENERGY STAR WINDOWS | Had to follow up regarding order | 1 |
| | Didn't do a good job installing windows | 1 |
| | Don't show up when supposed to | 1 |
| | Windows leaked after installation | 1 |
| | Windows found to have defects | 1 |
| | Other | 2 |
| | | |
| Insulation | Didn't receive adequate help | 2 |
| | Order was lost | 1 |
| | Did not invoice properly | 1 |
| | Other | 4 |
| | | |
| Programmable/ High Performance Thermostats | Had to engage in a number of callbacks | 1 |
| | Didn't receive adequate help | 1 |
| | Other | 2 |

Participating survey respondents having one or more program measures installed were asked if they noticed a reduction in their energy bill after installing a program measure(s). Figure 4-17 shows while the majority of participants noted a decrease in their bill after having insulation (61%) or programmable/high performance thermostats (56%) installed; only about a third of participant customers (34%) who installed ENERGY STAR windows reported a decrease in their energy bill. It is interesting to note that over ten percent of participants were not able distinguish a change in their bill for all three program measures, with almost one in five customers (17%) not knowing if there was a change in their energy bill after having ENERGY STAR windows installed.

**Figure 4-17: Noticeable Reduction in Energy Bill**



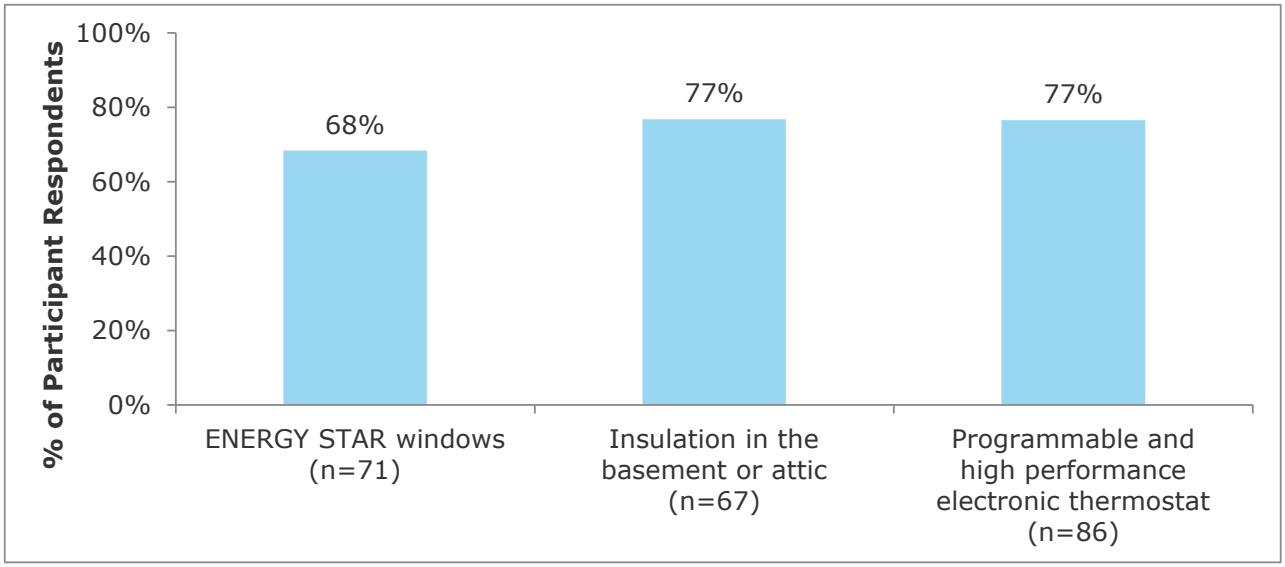

****May not sum to total due to rounding.*

## 4.4 Program Awareness

### 4.4.1 PARTICIPANTS

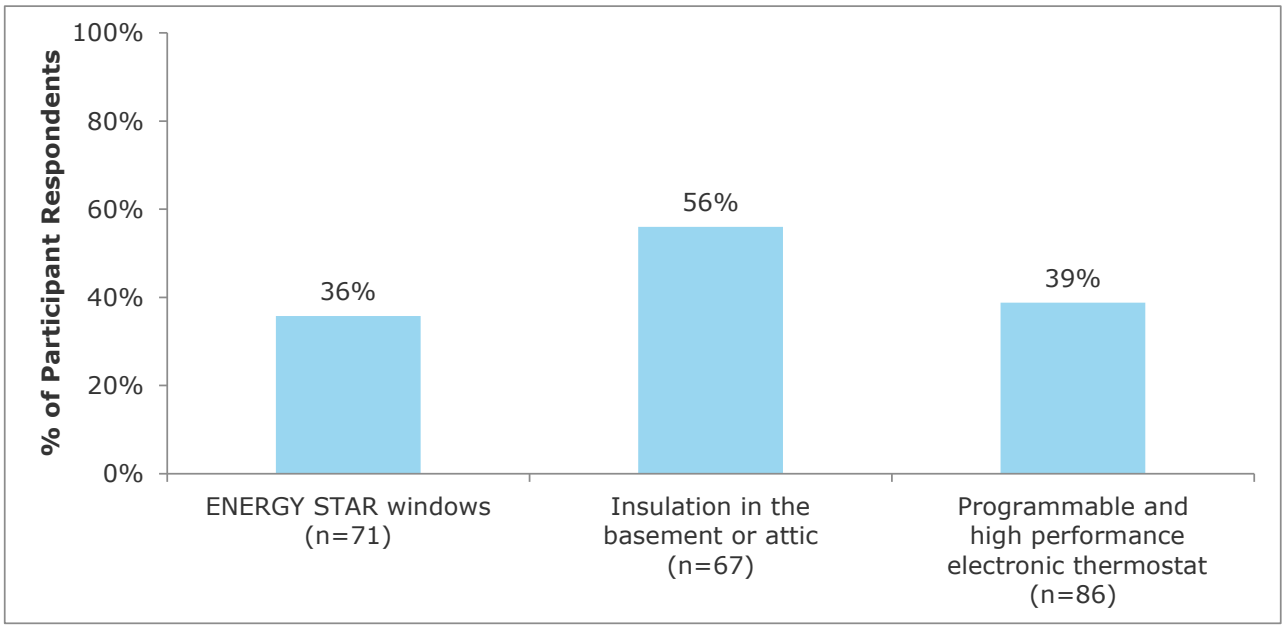
Participating survey respondents having one or more program measures installed were asked if they were aware of the *takeCHARGE* rebates before they contacted their contractor or retailer about purchasing and installing program measure(s). Figure 4-18 shows that most participants were aware of the *takeCHARGE* rebates before reaching out to their contractor or retailer for each of the measures offered by the program. This is indicated by over two-thirds of participants (68%) reporting being aware of the ENERGY STAR window rebates and over three-quarters (77%) being aware of the insulation and programmable/high performance thermostat rebates before talking with their contractor or retailer.

**Figure 4-18: Awareness of *takeCHARGE* Rebates before Contacting Contractor/Retailer**




Participating survey respondents having one or more program measures installed were asked if they had a type of measure in mind before speaking with their contractor/retailer. Figure 4-19 shows that while over half of participants (56%) having insulation installed had a type of insulation in mind, only a little over third of participants had a type of ENERGY STAR window (36%) or programmable/high performance thermostat (39%) in mind before talking with their contractor/retailer.

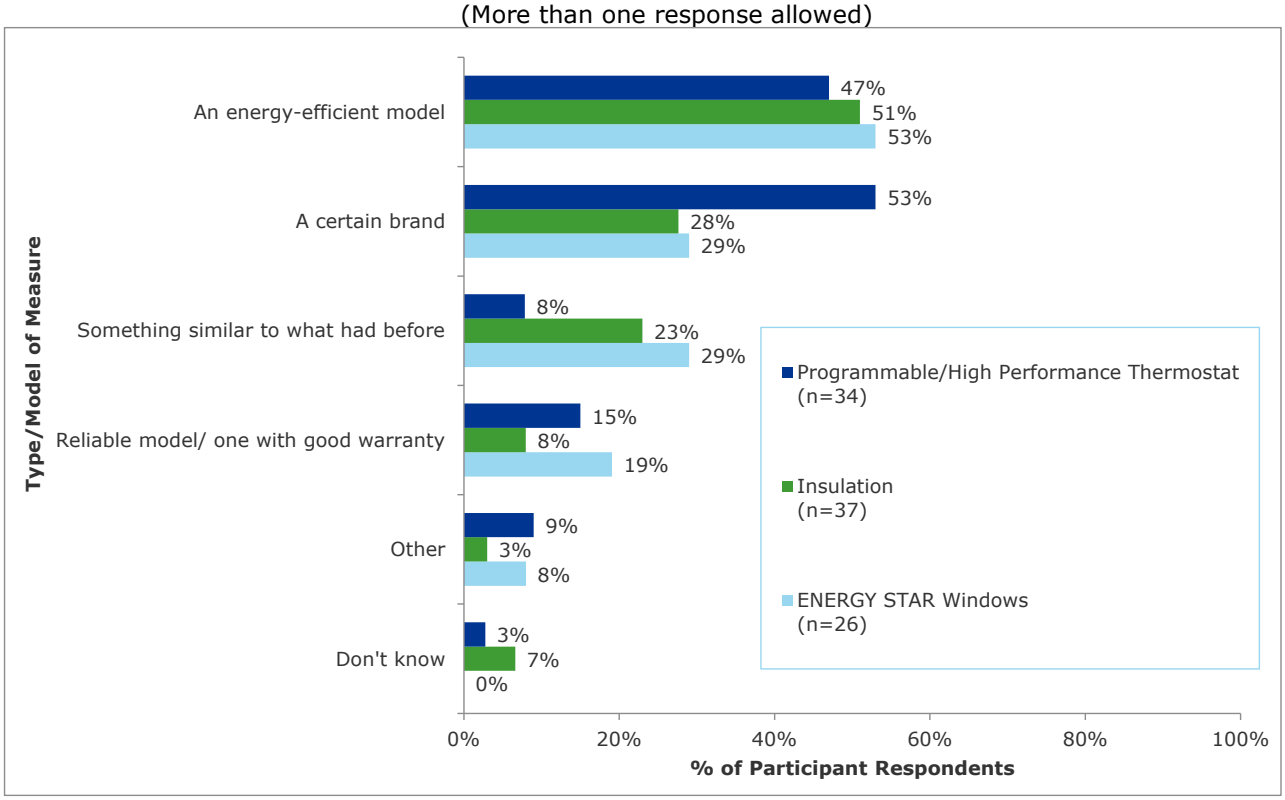
**Figure 4-19: Any Type of Program Measure in Mind before Contacting Contractor/Retailer**




Participating survey respondents indicating having a type of program measure in mind before meeting with a contractor/retailer were asked to describe the type of measure they wanted to purchase. Figure 4-20 shows the most prevalent features of program measures that participants desired included being an energy efficiency model, having a particular brand name, obtaining something similar to what is currently installed and possessing a measure with a strong warranty/reliability.

**Figure 4-20: Type of Program Measure in Mind before Contacting Contractor/Retailer**

(More than one response allowed)

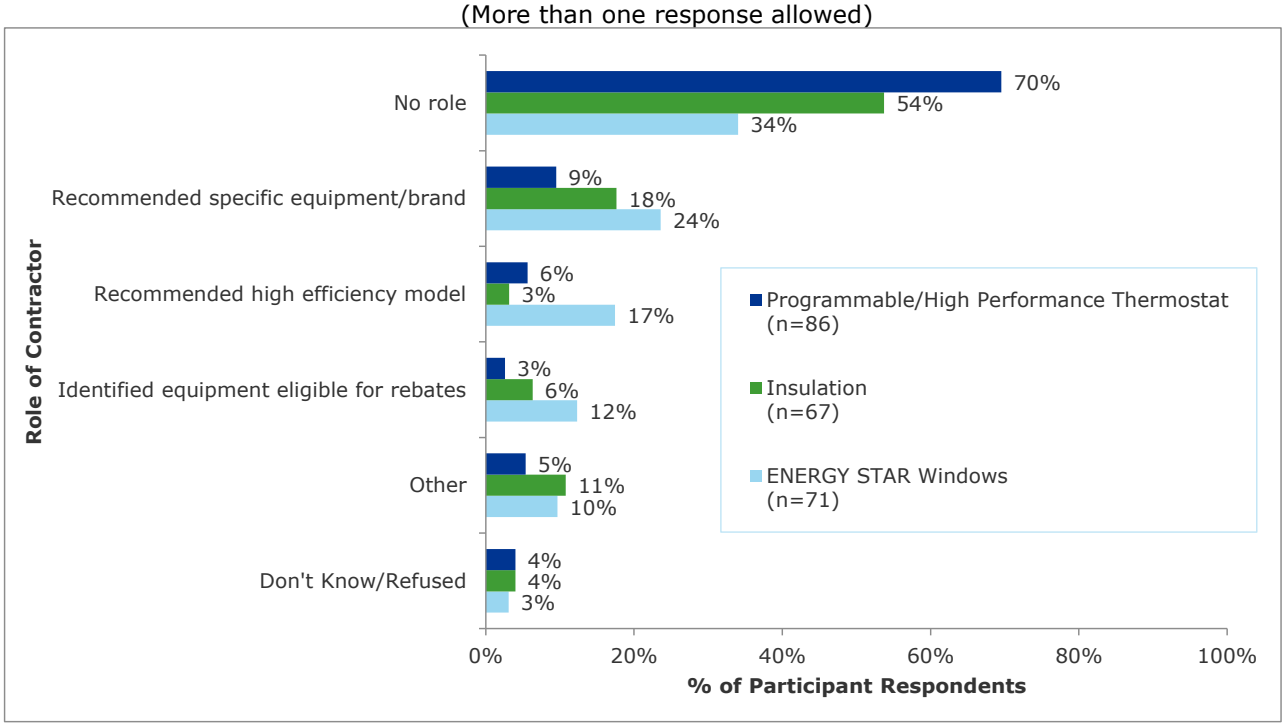



**May not sum to total due to rounding.*

Participating survey respondents having one or more program measures installed were asked to describe the role their contractor/retailer played in selecting a program measure(s). Figure 4-21 shows that while many times across all three program measures that a contractor/retailer did not play in role in selecting equipment, a noticeable amount of customers were receptive hearing about equipment brands and high efficiency models recommended by their contractor/retailer and equipment identified as being eligible for rebates.

**Figure 4-21: Role of Contractor/Retailer in Selecting Program Measure***

(More than one response allowed)



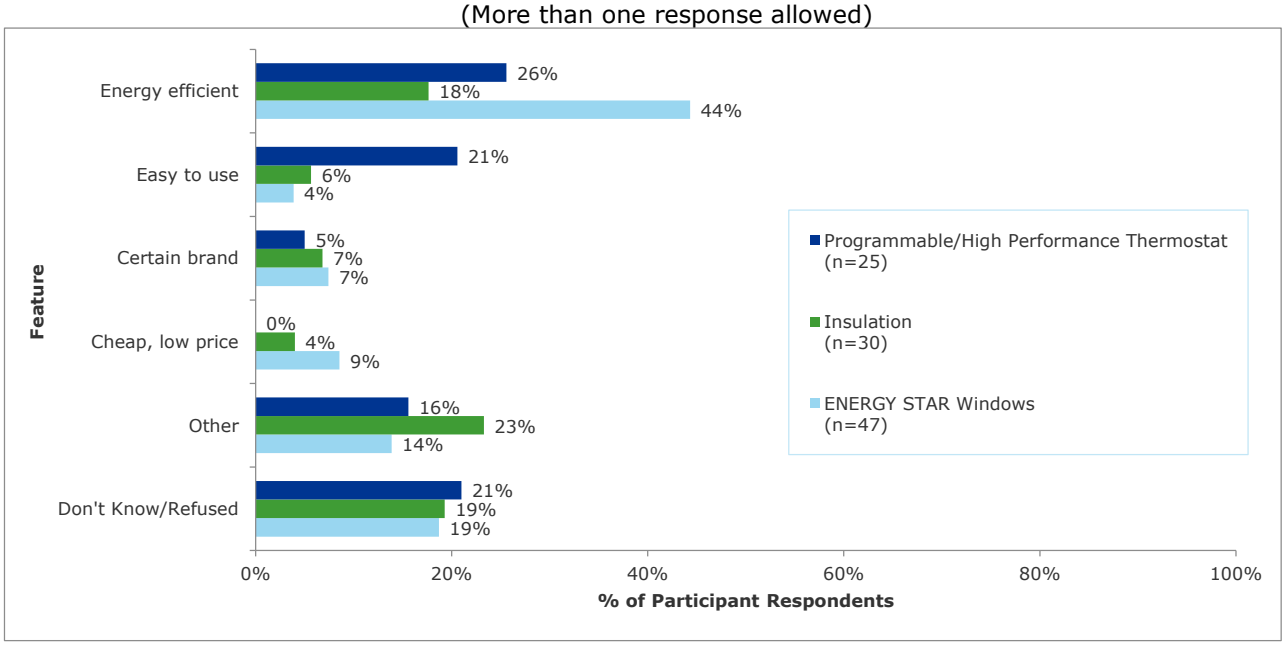

**To a lesser extent, additional advice provided by contractors/retailers include: Provided info about comfort level; Encouraged to replace measure; Helped estimate return-on-investment (ROI) or payback; Helped estimate energy savings; Informed us about takeCHARGE program; provided info about reliability of different windows; and provided cost estimates/bids.*

***May not sum to total due to rounding.*

Participating survey respondents indicating having a contactor/retailer who played a role in their purchase of the program measure(s) were asked what features were emphasized. Figure 4-22 shows that energy efficiency is the most cited feature across all three program measures.

**Figure 4-22: Program Measure Features Emphasized by Contractor/Retailer***

(More than one response allowed)

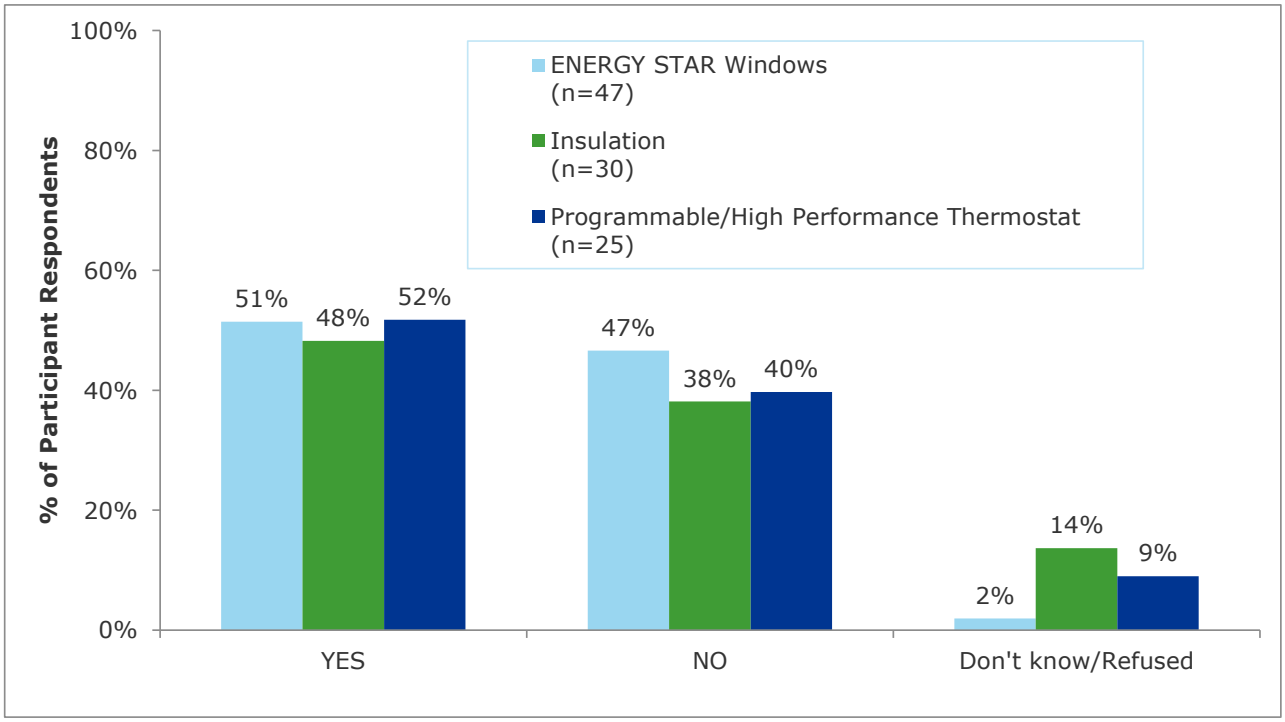



*To a lesser extent, features of program measures emphasized by contractors/retailers include: Equipment being endorsed by utility; Equipment being quiet; and Equipment having strong warranty/reliability.*

***May not sum to total due to rounding.*

Participating survey respondents indicating having a contactor/retailer who played a role in their purchase of the program measure(s) were asked if the contractor/retailer presented them with different models to choose from. For all three program measures, Figure 4-23 shows participants report being presented with different models about half the time.

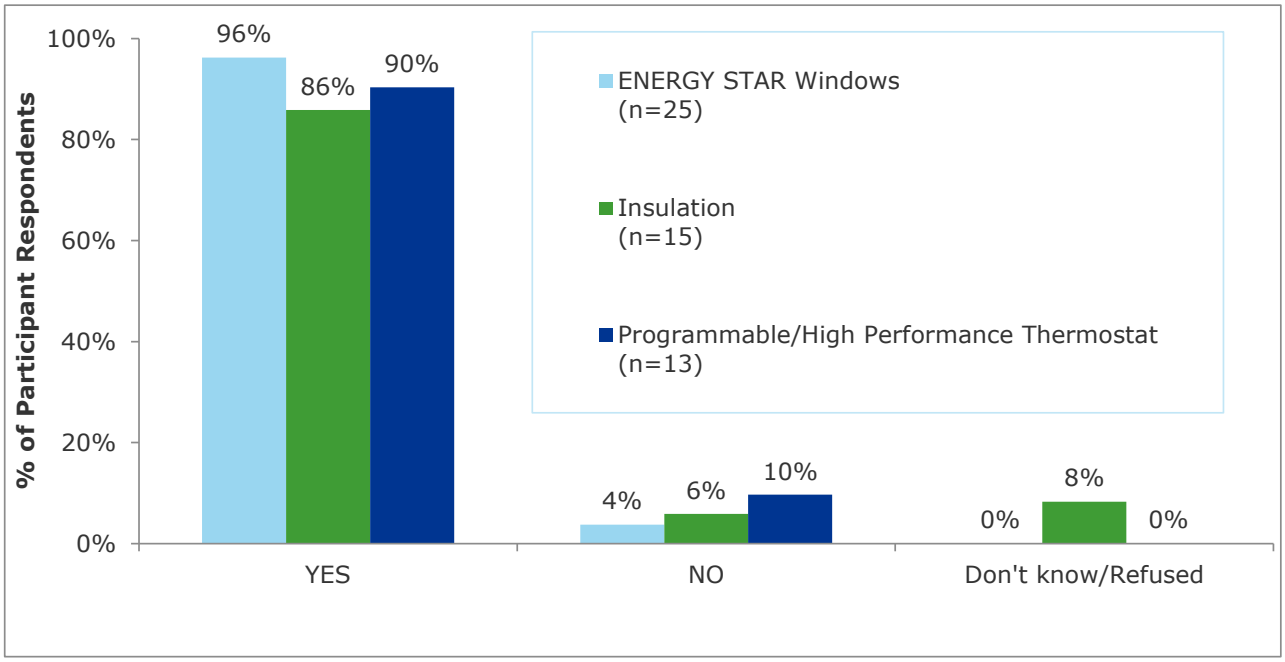
**Figure 4-23: Did Contractor/Retailer Present Different Models?**




*May not sum to total due to rounding.*

Participating survey respondents indicating having a contactor/retailer presented them with different models were asked if the contactor/retailer provided them with price quotes for the program measures. Figure 4-24 shows that most participants report being presented with pricing for all three program measures.

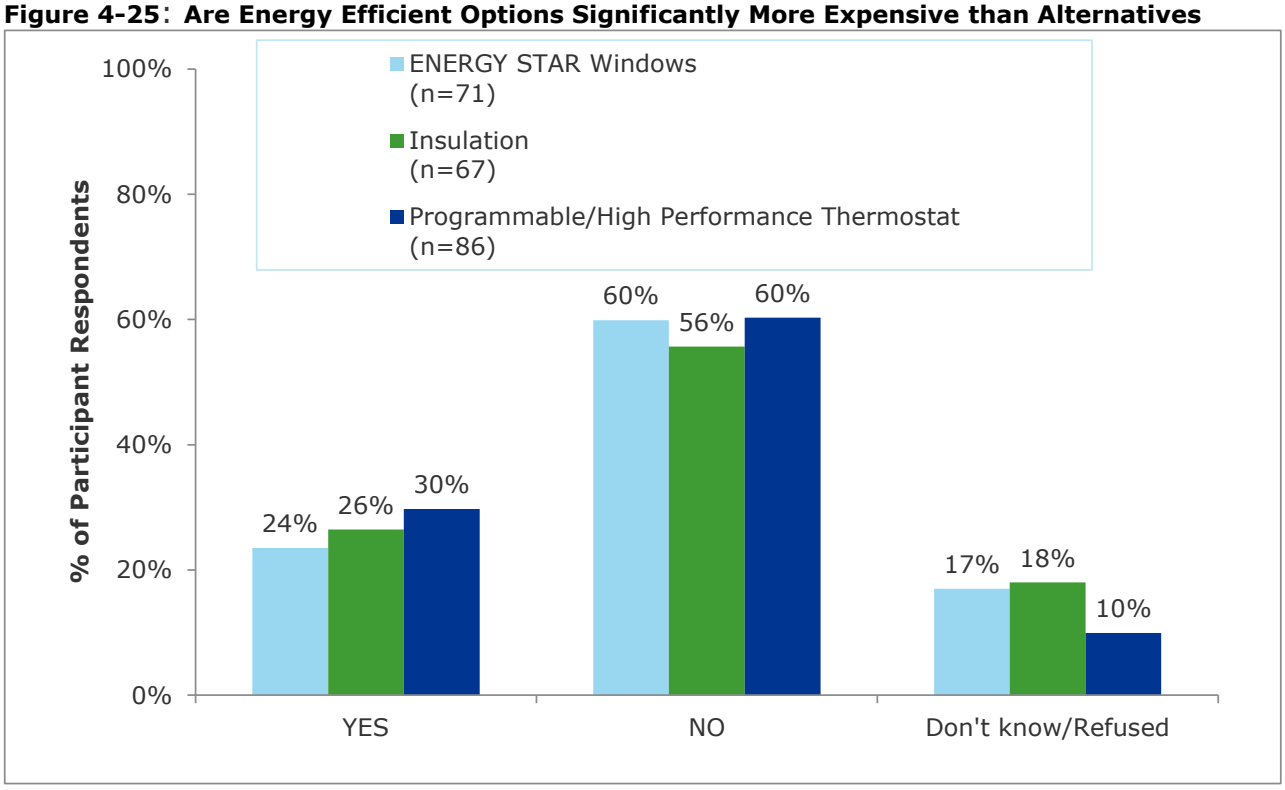
**Figure 4-24: Did Contractor/Retailer Present Price Quotes?**




**May not sum to total due to rounding.*

Participating survey respondents having one or more program measures installed were asked if they believed that energy efficient measures offered by the program were noticeably more expensive than alternative measures they could have purchased. For all three program measures, Figure 4-25 shows that around twice as many participants did not think the equipment was significantly more costly than alternative measures.

**Figure 4-25: Are Energy Efficient Options Significantly More Expensive than Alternatives**

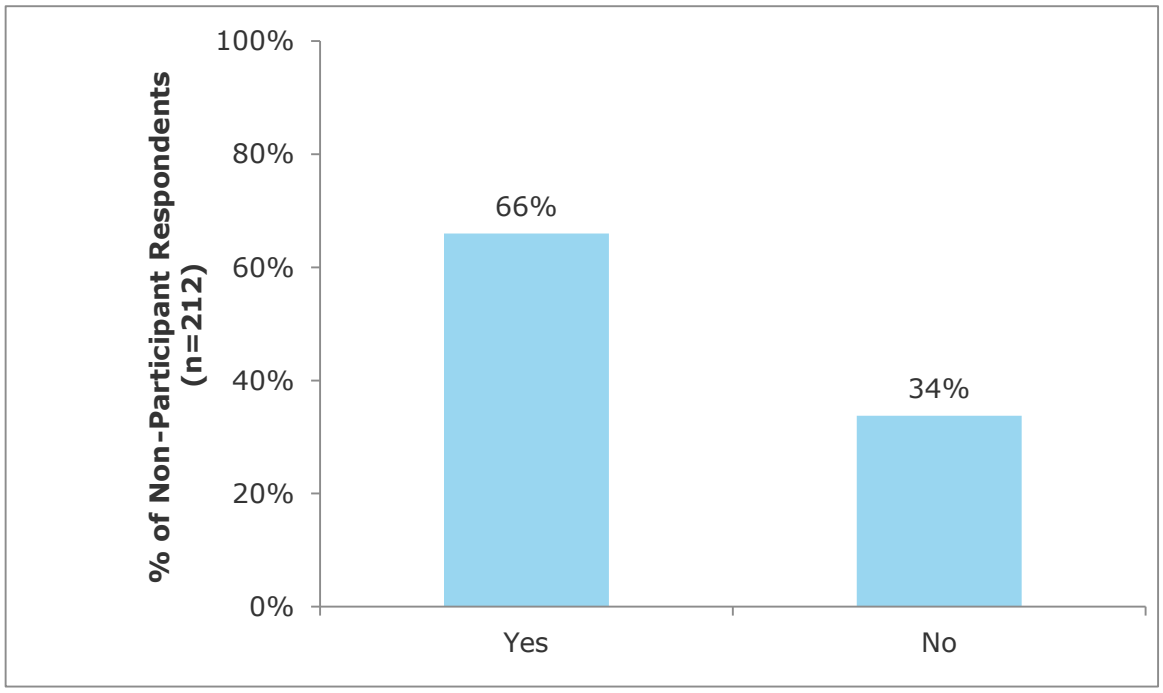



**May not sum to total due to rounding.*

## 4.4.2 NON- PARTICIPANTS

Survey respondents who did not participate in the *takeCHARGE* program were asked if they were aware of the rebate program. Figure 4-26 shows that about two-thirds of non-participants were aware of the *takeCHARGE* program.

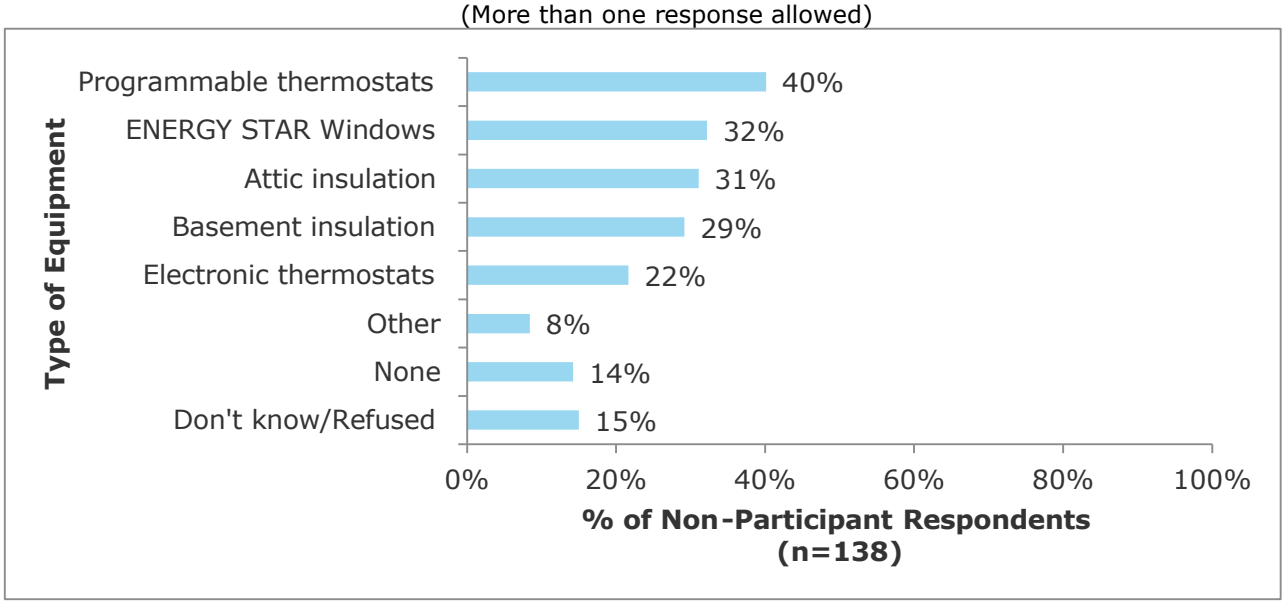
**Figure 4-26: Awareness of Newfoundland Power and Hydro's *takeCHARGE* Programs**




Non-participant survey respondents who indicated being aware of the *takeCHARGE* program were asked what type of equipment rebates or energy related services the program offered. Figure 4-27 shows that about a third of non-participants indicating program familiarity were knowledgeable the *takeCHARGE* program included (programmable) thermostats (40%), ENERGY STAR Windows (32%), attic insulation (31%) and basement insulation (29%).

**Figure 4-27: Types of Equipment *takeCHARGE* Program Offers**

(More than one response allowed)



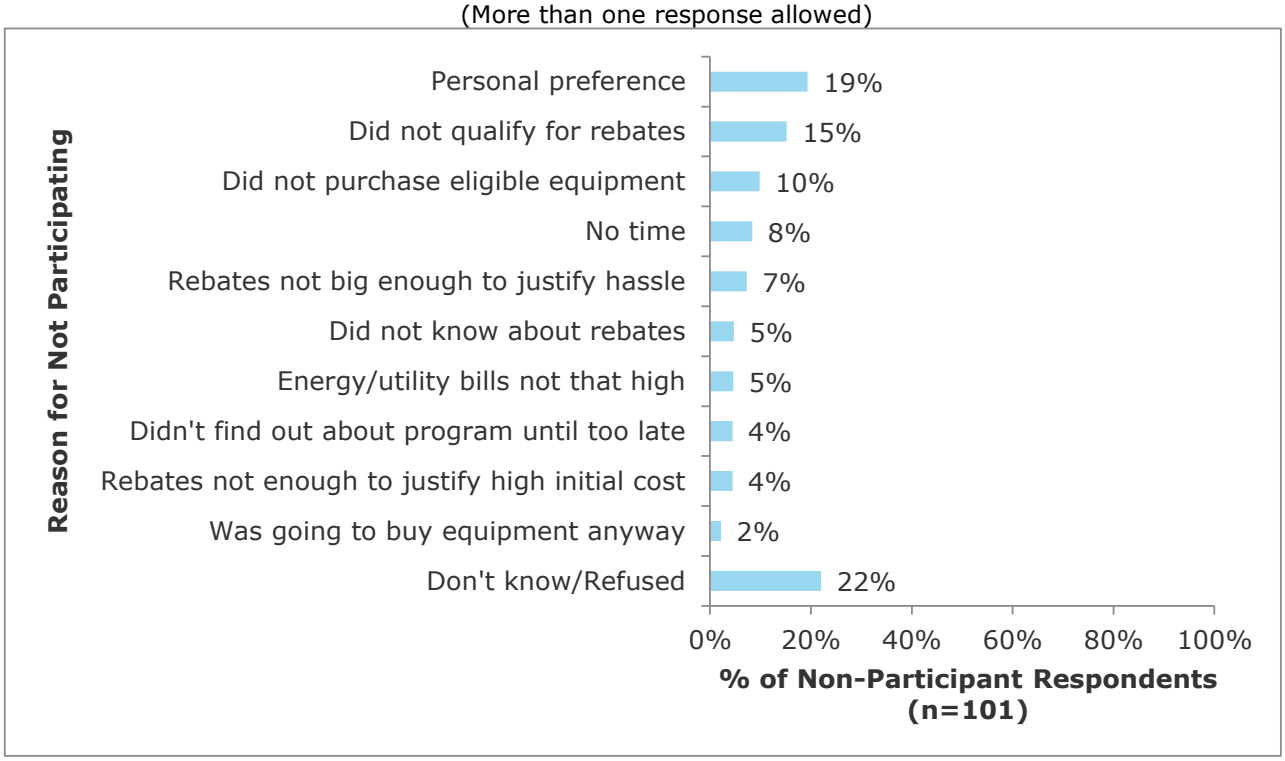

Non-participant survey respondents who identified awareness of at least one of the measures related to the *takeCHARGE* program were asked why they did not participate in the program. Figure 4-28 shows that non-participants provided many reasons for not making use of the program, with the most prevalent being 1) a personal preference for not participating; 2) buying equipment that did not qualify for program rebates (e.g., partial to a brand/manufacturer that was not offered rebate by the program);

and/or 3) purchasing equipment that was not eligible for the program rebate (e.g., buying program measure that was not considered to be energy efficient by the program).

Respondents may have cited personal preference for a variety of reasons. For example, some respondents do not mind paying full price and have no desire to take advantage of the rebates. Respondents may have state personal preference because "no time," the "rebates not big enough to justify the hassle" of pursuing, and/or "was going to buy the equipment anyway." The Utilities may wish to probe further on the reasons underlying the personal preference responses in future research activities.

**Figure 4-28: Reasons for Not Participating in *takeCHARGE* Programs**

(More than one response allowed)



# 5 PROGRAM PARTNERS

## 5.1 Contractor Surveys

The DNV GL team conducted interviews with participating and non-participating contractors in Newfoundland and Labrador. Table 5-1 shows the type of contractors that were interviewed. Among the participating contractors, nine contractors were from Avalon and the remaining five were from Rest of Island and Labrador. For non-participant contractors, six were from Avalon and six were from Rest of Island and Labrador. Given the relatively small sample sizes, the survey findings for Rest of Island and Labrador respondents are reported together. It is also important to note that the small sample sizes are not statistically significant but rather provide qualitative insight into the performance of the programs, market trends and customer behavior.

**Table 5-1: Profile Contractors Survey Respondents**

| | *takeCHARGE* Participants | Non-Participants | TOTAL |
|---|---|---|---|
| **General Contractor-New Construction Only** | 10 | 3 | 13 |
| **General Contractor-New Construction and Remodelling** | 4 | 5 | 9 |
| **General Contractor-Remodeling Only** | 0 | 2 | 2 |
| **Specialised Contractor** | 0 | 2 | 2 |
| **TOTAL** | 14 | 12 | 26 |

### 5.1.1 Program Awareness and Design

#### 5.1.1.1 Awareness and Understanding of the *takeCHARGE* Programs

The level of understanding of the mechanics of the programs differed among participants. Most participants have a good understanding of the programs; know where to look for additional information when needed and how to keep up-to-date with the programs' changes. A few participant contractors are less aware of the programs changes and expect the utilities to promptly inform them about any modification (rebates, new measures, deadlines etc.). These findings were consistent for both Avalon and Rest of Island/Labrador contractors.

Among the non-participants in both Avalon and Rest of Island/Labrador, very few were aware of the programs (25%) and the majority of those stayed abreast of the programs' offerings and do in fact, pass the information to their clients.

Most participants stated that the advertisement of the *takeCHARGE* programs was appropriate and very useful. Radio, TV and the internet were cited as the most frequent ways for learning about the program, followed by pamphlets, flyers and mailings. Presentations at the Home Builders Association were also mentioned as a very useful and effective way to increase participation to the programs:

"If you convince one builder to use the program you can get 50 houses but convincing each individual home owner with the TV ads takes a lot of work."

Other marketing suggestions and feedback from the builders included:

- Participating contractors particularly appreciate the opportunity of having a contact person at the utility to answer all their inquiries and support them with the programs' application.
- Add stickers to identify the program (similar to ENERGY STAR stickers for windows)
- Advertise in movie theatres citing the province's high movie attendance
- Include program materials when building approvals are issued

### 5.1.1.2 Assessment of How *takeCHARGE* Programs Meet Contractor Needs

Overall, contractors in general did not indicate a need in promoting the programs' measures to their clients. Most contractors promoted the use of energy efficient features in their work without mentioning the *takeCHARGE* programs to their clients (unless the customer asks). The two primary reasons for this response were either because the contractors applied for the rebate directly or because the contractor thought the program information was promoted by the real estate agencies. Contractors often used energy efficiency as a selling point but did not mention the program to their customers to avoid customers ask for a lower selling price on the house or for concerns that the customer may apply for the rebates directly. Some contractors mentioned the program and its rebates only if a customer rejects the proposed efficient measures.

It is important to note the contractors and builders who included energy efficiency as part of their standard offerings viewed the *takeCHARGE* programs as an easy way to recover some of their investments in energy efficiency features that they would have made without the program. It is important to note that the *takeCHARGE* programs are no longer offered to new construction customers due to the new more energy efficient building codes.

The contractors who offered energy efficient measures and promoted energy efficiency usually characterized their clients as aware and interested in energy efficiency, even if they were not aware of the *takeCHARGE* programs. While contractors believe the programs were well marketed, they could not state whether their clients' increased interest and/or awareness in energy efficiency was directly linked to the *takeCHARGE* programs.

According to participating contractors, customers' awareness of the programs can vary by location. The level of interest and awareness among the contractors' clients was higher in St John's and its greater area (Paradise, Mount Pearl and Conception Bay South):

a) 43% of the participating contractors indicated that 40-60% or more of their clients were aware of the *takeCHARGE* programs and ask about the programs. All of these contractors primarily work in St John's and its greater area.

b) 57% of the participating contractors indicated that clients were either unaware or did not ask about the program

These contrasting answers likely reflected the fact that a majority of interviewed contractors did not talk about the programs with their clients since they are directly applying for rebates, and did not see any reason to discuss the programs.

Some contractors would welcome a case study showing expected and achieved savings from the proposed measures and higher rebates, in particular for the more expensive (e.g. ENERGY STAR windows) or less popular (e.g. programmable thermostats) measures.

### 5.1.2 Program Outreach and Role of Energy Efficiency

Among participating contractors there are three distinct roles for energy efficiency:

a) Approximately 35% of all participating contractors did not promote energy efficiency. Furthermore, nearly all (4/5) contractors in the Rest of Island/Labrador geography chose not to promote energy efficiency measures to homeowners Promoting energy efficiency benefits in residential homes was handled separately by a real estate agency, or they were not interested or considered energy efficiency measures too expensive.
b) Nearly a third of participating contractors, with all but one contractor located in the Avalon region, adopted energy efficiency measures and building practices as part of the standard baseline project offerings and did not explicitly promote the energy efficiency products or the *takeCHARGE* programs.
c) The remaining third of participating contractors did actively use energy efficiency as a selling point and have integrated it into their marketing strategy.

The contractors that did not promote energy efficiency considered the business value of marketing efficiency, either because efficiency was already part of their business model, or because they did not believe their customers were interested. The type of house built and the clients' level of wealth played a relevant role:

a) For average starter homes, the level of energy efficiency measures and features was generally low, because the buyer was either not willing to pay the extra price when purchasing the house or the builder was not interested in energy efficiency;
b) For high-end luxury houses, buyers were willing and able to pay more at purchase. Even if energy efficiency measures are built as default, they were not included in the marketing since the buyers were more interested in other features, like kitchen cabinetry, top line appliances and hot tubs.

### 5.1.3 Contractor Barriers

Contractors cited two market barriers in the adoption of the type of measures offered in the *takeCHARGE* programs: cost and lack of interest. Measure cost, in particular for insulation and windows installation, was been cited as one of main barriers by 50% of the participant contractors, with no distinction between new construction and remodeling. Despite the rebates, some measures required an initial investment that many clients were not willing to make. Most contractors believe that higher rebates for these measures would lead to a much higher uptake. Many contractors believed that building an efficient home is the best choice, as it not only improves the comfort but also the energy and economic savings in the long term, but often it is not enough to convince their clients to invest in energy efficiency measures upfront One contractor suggested to drop sales tax (e.g. on the purchase of ES windows) as a possible solution to the cost barrier however, a change in sales tax is government decision and beyond the control of the Utilities.

The second market barrier cited was the lack of interest in energy efficiency and the lack of information about the program measures. Some contractors find it hard to provide relevant information regarding the energy savings of program measures to their clients. Contractors stated that having data to demonstrate the potential savings to clients would be useful.

Over 20% of the participating contractors did not see any barriers and that the *takeCHARGE* programs had adequately addressed the energy efficiency advantages for homeowners. These respondents were

the same contractors, primarily located in the Avalon region, who believe in the value of energy efficiency and they adopted it in their business model. All of these contractors work predominately in the new construction segment.

### 5.1.4 Contractor Program Satisfaction

Across all regions, the majority of participating builders and constructors, 86%, were generally very satisfied with the *takeCHARGE* programs. Only 7% of the contractors report to be very dissatisfied.

Most of the contractors had positive interactions with the Utilities and were offered assistance in filling the forms. The contractors were satisfied with the rebate levels and would like to see the programs continue.

The negative feedback reported was regarding the amount of paperwork required to apply for a rebate and how it discouraged some homeowners from participating in the programs. Contractors stated that it was easier for them to track invoices and bills than for residential customers to sort through numerous invoices and receipts. Contractors also suggested that the paperwork burden could be streamlined if the option to apply online was available. In discussions with the Utilities' program staff, DNV GL has learned that this option is currently under development.

### 5.1.5 Market Characterization

As shown in Table 5-2, insulation measures were the most popular among participating contractors. All participants have installed basement and attic insulation meeting (or exceeding) the programs requirements in at least 60% of the new constructions built in 2012.

**Table 5-2: Overview of Installed Features in 2009-2012 by Participant Respondent**

| | Participant Contractors by Geography | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FEATURES** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** |
| **Electric heat** | 100% | 95% | 95% | 100% | 100% | 100% | 90% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| **Attic insulation (R32-R40)** | 100% | "buildin g code" | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 80% | 100% | 50% | 100% |
| **Basement insulation (R12-R20)** | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 60% | 65% | 100% | 100% | 100% |
| **ENERGY STAR Windows** | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 18% | 100% | 0% | 30% | 100% |
| **Programmable thermostats** | 100% | n/a | 10% | 100% | 10% | 100% | 40% | 100% | 0% | 4% | 5% | 100% | 0% | n/a |
| **Electronic thermostats** | 0% | n/a | 90% | 0% | 90% | 0% | 60% | 0% | 100% | 45% | 20% | 0% | 30% | n/a |

ENERGY STAR windows were installed by nearly 80% of the contractors, also quite common (11/14). However, three of the Rest of Island/Labrador contractors stated that ENERGY STAR windows comprised 30% or less of their window installation with one contractor stating no ENERGY STAR windows being installed. The installation of electronic and programmable thermostats was much less frequent (9/14 installed only non-traditional thermostats in the last 2 years) but it seems to be becoming a common practice in the new construction. The majority of these contractors were located in the Avalon region.

Insulation measures were also implemented by non-participants (see Table 5-3): attic insulation meeting or exceeding the program's requirements was installed by 75% of the interviewed contractors; the installations of ENERGY STAR windows and programmable and electronic thermostats were less frequent.

**Table 5-3: Non-Participants contractors - Overview of Installed Features in 2012-2013**

| NON-PARTICIPANT RESPONSES BY CONTRACTOR AND GEOGRAPHY | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Features** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Avalon** | **Rest of Island/Labrador** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** | **Rest of Island/ Labrador** |
| **Electric heat** | 50% | n/av | 100% | 90% | 40% | 80% | 50% | 100% | 100% | 100% | 30% | 100% |
| **Attic insulation (R32-R40)** | 100% | 100% | 100% | 100% | n/a | 100% | n/a | 100% | 100% | 100% | n/a | 100% |
| **Basement insulation (R12-R20)** | 100% | 100% | 100% | 100% | n/a | 100% | n/a | 60% | 100% | 100% | n/a | n/av |
| **ENERGY STAR Windows** | 75% | 0% | 100% | 0% | n/a | 10% | n/a | 18% | n/a | 100% | n/a | 100% |
| **Programmable thermostats** | 75% | 0% | 0% | 0% | 2% | 0% | 25% | 4% | n/a | 16% | 50% | 50% |
| **Electronic thermostats** | 0% | 0% | 0% | 0% | 2% | 0% | 25% | 45% | n/a | 0% | 50% | 0% |

n/a: not applicable

n/av: don’t know/don’t remember

### 5.1.5.1 Future Market Trends

Both participating and non-participating contractors expect the adoption of energy efficiency measures to continue in the future. Contractors identified a number of energy efficient products that will gain markets share in the coming years:

- Heat recovery ventilators (HRV)
- On-demand hot water systems.

Contractors and builders expressed their concern about the availability of rebates for some of the more expensive products and materials particularly insulation foams, heat pumps and HRVs.

### 5.1.5.2 Factors Attributable to Market Trends

Most participating contractors, roughly 90%, did not believe the recent changes to the market can be directly attributed to the *takeCHARGE* programs. Some participants reported that the change was due to their customers' demands for energy efficiency measures (in particular for insulation), though most participants believed that the real driver was the change in the building codes. In the St. John's area, the adoption of a new municipal code pushed builders and constructors to adopt not only the measures required by the new code, but in some cases to promote even higher energy efficiency standards to their clients.

Regarding the influence of the building codes in the adoption of energy efficiency measures, there were again two opposite perceptions: on one hand, those who thought new codes did not have any impact on the installation of the energy efficiency measures. The respondents were builders and contractors who had already implemented higher efficiency standards in their projects. On the other hand, those who believe the codes, in particular at the municipal level, had a vast influence in the adoption of energy efficiency measures.

When asked about the changes the programs brought to the residential retrofit and new construction markets, participants gave multiple answers:

a) A higher demand for energy efficiency homes and measures-in particular insulation, (5/14);
b) The increased interest and awareness among customers (3/14);
c) Better workmanship and awareness among constructors (3/14);
d) Only a few (3/14) think the programs made no difference.

However, half of the participating contractors (7/14) did not believe that the programs led to the changes in demand for energy efficiency measures or increased contractor activity. This finding was consistent in both the Avalon and Rest of Island/Labrador regions. However, slightly less than half of the contractors (6/14) thought the programs helped promote energy efficiency measures that would not otherwise have been installed, in particular with ENERGY STAR windows and programmable thermostats.

Considering also the fact that in some areas the change in the municipal building code drove the market towards the adoption of more efficient features, it is difficult to establish a clear cause-to-effect link between the *takeCHARGE* programs and their impacts on the market.

It is obvious that the level of awareness and the quality of the offering for participating contractors has positively changed over time, but those changes cannot be directly related to the programs. At times, it seems instead that the programs were considered as an additional bonus, in particular for the contractors that were already promoting energy efficiency.

Very few participants affirmed to have changed their business practices as a result of the programs (3/14).

#### 5.1.5.3 Underserved Market Segments

When asked about underserved market segment most of the interviewed contractors cited heating losses in older homes. The homeowners in this sector were typically older residents on fixed incomes or low income customers that do not have money available for the upfront investments needed to add roof insulation.

Other recommendations included:

- Large residential and institutional buildings (e.g. schools, hospitals) that may have large potential savings and property managers who are more prone to investments with longer payback time.
- Other measures identified include heat pumps, boilers, and HRVs (HRVs are now offered in the *takeCHARGE* programs), appliances and lighting.

### 5.1.6 Other Key Findings

It seems that the marketing of *takeCHARGE* programs may not have reached builders and contractors across the Province and sectors equally. Whereas the large majority of participating contractors 86% was concentrated in St. John's and its greater area, the geographical location among non-participants was more diverse.

Similarly, the *takeCHARGE* programs did not have the same outreach and impact across sectors, since the vast majority of interviewed contractors work in new construction and some of the comments they provided highlight the limited impact the programs have in the remodelling sector.

### 5.1.7 Conclusions and Recommendations

Builders and constructors were generally very satisfied with the programs. Most of the contractors had positive interactions with the Utilities, were offered assistance in filling the forms if needed, found the rebate levels appropriate and would like to see the program continue. The negative remarks were from a single respondent and were linked to the amount of paperwork required to apply for a rebate. The Utilities have already taken actions to streamline the process and provide the opportunity to apply online.

The programs have been able to reach businesses of different size (from big companies, building dozens of houses per year, to very small contractors, only building two to three houses per year). Most of the interviewed contractors are general contractors. There are very few specialized contractors participating to the programs. The large majority of interviewed contractors are concentrated in the St. John's and its greater area.

The programs had a higher contractor participation in the new construction sector, whereas its outreach and impact in the remodelling sector appeared very limited, from the contractors' perspective. Given the pace of new construction in Newfoundland and Labrador, this was not a surprising result. The boom in the new construction market offers the Utilities opportunities to provide energy efficiency programs targeting this market segment. This is discussed in greater detail in Section 8 of this report.

The fact that participating contractors have incorporated the energy efficiency measures offered in the *takeCHARGE* programs as part of their baseline offerings raises some concerns regarding free-ridership and the real impact that the program had on energy savings. Some of the contractors clearly stated that the program is an easy way to recover some of the money they would have invested in energy efficiency features even if the *takeCHARGE* programs were not in place.

Considering that most home builders and contractors apply directly to the program and its limited success in the remodeling sector, customers' ability to participate to *takeCHARGE* appears to be limited. Utilities may need to reconsider their target audience, focusing on tailored marketing tools and facilitating the access to the program to their target audience. Currently, contractors specialized in remodeling do not seem to be reached by the program or to show interest in participating.

In terms of impacts on the market, the installation of better attic and basement insulation has considerably improved over time but it is very difficult to establish a clear cause-to-effect link with the *takeCHARGE* programs. Changes in the building code (in particular at the municipal level) and other factors (e.g. increasing heating costs) also contributed to these changes.

## 5.2 Retailer Surveys

This section summarizes interview results from a sample of Participating Retailers that work with the *takeCHARGE* program: 31 participating retailers and five non-participating retailers. Of the participating retailers, 10 were located in Avalon, 22 were from the Rest of Island and one from Labrador. The non-participating retailers were located in Avalon (3 respondents) and one each in Labrador and Rest of Island. Given the small sample size limited our ability to generalize the results to the retailer population. Therefore, the results were not weighted up to the retailer population. Also, since there was a single respondent from Labrador, the Labrador and Rest of Island responses were reported together where relevant.

We also completed surveys with a small sampling of non-participant retailers (n=5) and are reporting those results when germane to each subsection. Because of the difficulty of obtaining the cooperation of non-participant retailers, we report results from this group directly as a single, un-weighted group – not broken out by utility or geography.

The DNV GL team conducted in-depth and quantitative interviews participating and non-participating retailers in Newfoundland Power and Hydro's service territories. While the Utilities provided the DNV GL team with the list of participating retailers, the non-participant retailer sample frame was developed based on publically available lists of retailers located in Newfoundland and Labrador.

A total of 38 retailer in-depth interviews were completed across the Utilities. Table 5-4 shows the breakout of completed interviews by participant type and company, and also highlights the response rate for each breakout group. The response rate for all participating retailers was 22% overall and for non-participants was 3%.

**Table 5-4: Retailer Interview Completes**

| Sampling Metric | Total | Participants | | |
|---|---|---|---|---|
| | | Avalon | Rest of Island | Labrador |
| Sample Frame | **218** | 120 | 78 | 20 |
| Eligibility Rate | **98%** | 95% | 100% | 100% |
| Eligible Population | **214** | 114 | 78 | 20 |
| Respondents | **31** | 8 | 22 | 1 |
| Response Rate | **56%** | 40% | 85% | 11% |
| Sample Weight For Each Respondent | | 14.2857 | 3.5455 | 20.0000 |

### 5.2.1 Characterization of Participating and Non-participating Retailers

The majority of participating retailer program partners were independent equipment retailers. This result was consistent for both Avalon and Rest of Island/Labrador (80% and 81%, respectively). A small number of the remaining retailers indicated they were part of a corporate store or chain, a franchise retailer, or wholesale retailer.

While a strong majority of participant retailers in both regions were independent equipment retailers, there were key differences in how survey respondents characterize the scope and scale of their businesses within this retailer characterization type. Some of the key differences are as follows:

- Avalon retailers had larger retailer businesses overall; the mean number of full-time employees was nearly 31. The mean number of full-time employees within a Labrador retailer businesses is 8.5.
- In both Avalon and Rest of Island/Labrador approximately 40% of participating retailers had more than one store. Among the retailers who had two or more stores, the mean number of stores was just over 3 stores.
- All but one participating retailers with multiple locations reported they have independent decision-making ability at the *store level*. Far fewer – about half – of Rest of Island retailers reported having similar decision-making authority.
- Rest of Island/Labrador retailers more frequently reported selling more measures types than Avalon stores; in fact, 70% of Rest of Island/Labrador retailers indicated they sell windows, insulation, **and** programmable thermostats, which may suggest that retailers had to "wear a lot of hats" in the inventory assortment they offered their customers. The remainder of the Rest of Island/Labrador sold either a one or a combination of the measures
- While lower than the Rest of Island/Labrador, the majority of participating retailers in Avalon, 60%, confirmed an in-store measure assortment that covers all three programs; another 20% reported they sold only one (programmable thermostats or windows) of the program measures. The remainder of Avalon retailers sold some combination of two measure options.

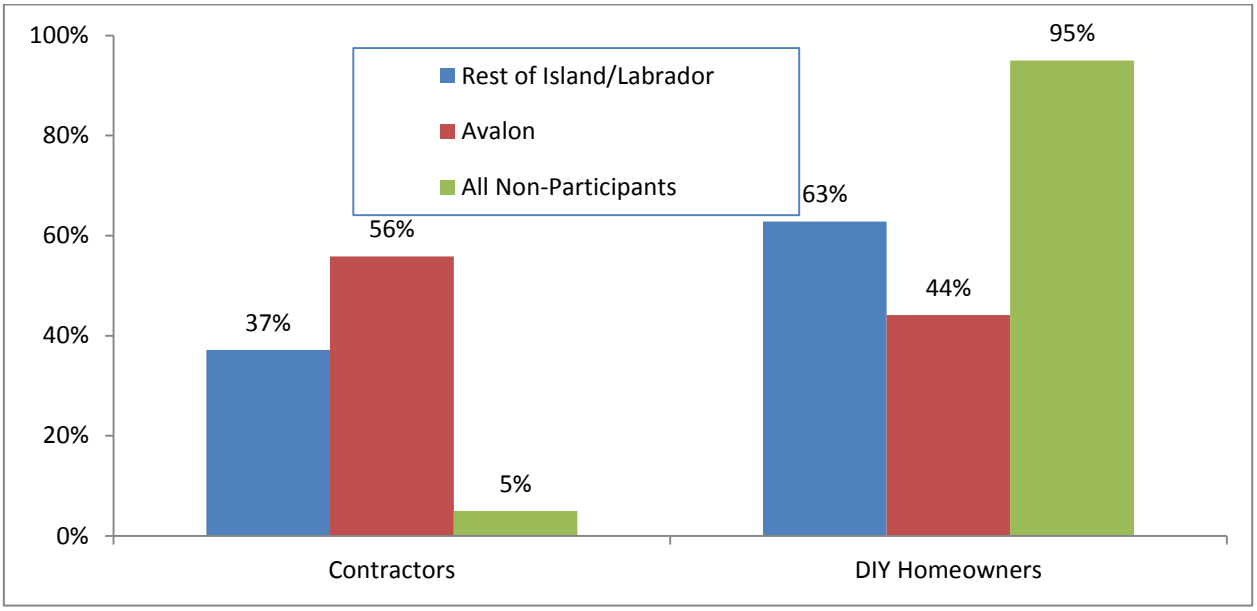
Non-participant retailers did have a slightly different profile than participating retailers. Non-participant retailers in were more likely to own just one or two stores, had a singular business focus (only 1 respondent sold all three measures), and had around 10 employees. Like participating retailers, a majority of our non-participant retailers categorized themselves as independent equipment retailers and make sales-related decisions at the store level.

We surveyed retailers to identify the customer segment to which they were selling each measure type to most frequently and also asked that they categorize the type of measure they were most often selling to gain a perspective about each retailer's customer makeup and sales. We summarized their responses by measures in the sections that follow.

**Retailers on Insulation Sales**

In Rest of Island/Labrador 40% of respondents did not know if sales were made by Do-It-Yourself (DIY) homeowners or contractors. However, for those respondents who did know who were purchasing insulation, the sales were predominantly to DIY customers. Participating retailers reported that 63% of insulation sales are to DIY homeowners and 37% to contractors. In Avalon, 70% of the participating retailers could identify if DIY homeowners or contractors purchased insulation however, the split between DIY homeowners and contractors was split more evenly but with the majority of sales made by contractors, 56%. Non-participants reported selling almost all (95%) insulation to DIY homeowners and only 5 percent to contractors. Figure 5-1 summarizes insulation market share by customer segment.

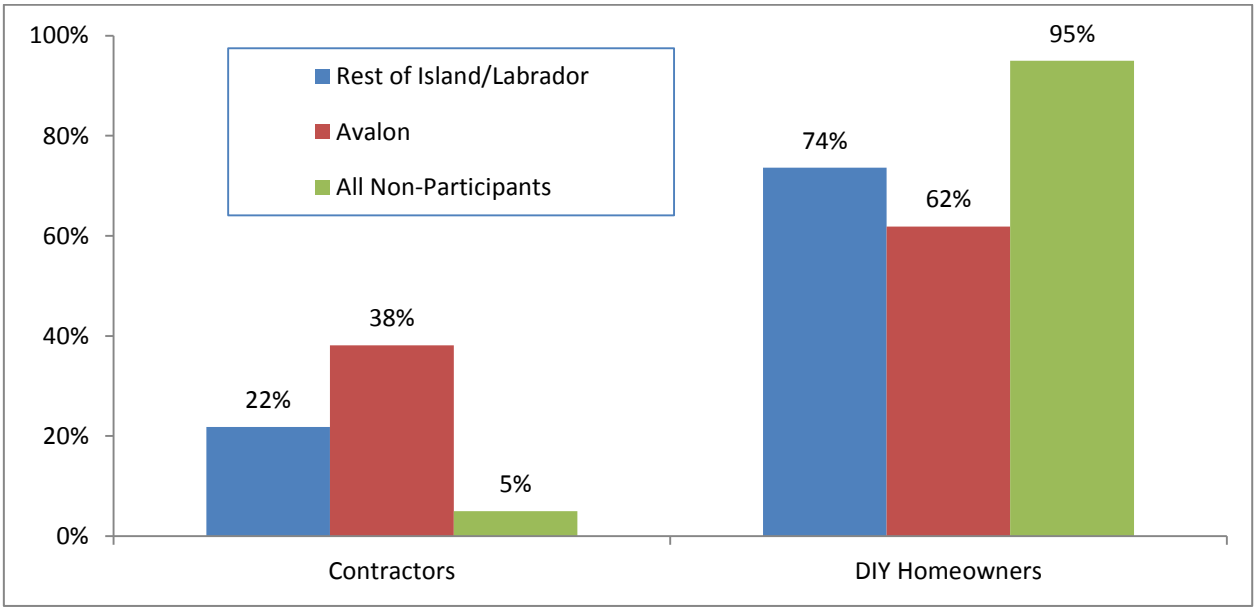
**Figure 5-1: Insulation Market Share by Customer Segment**




**Retailers on ENERGY STAR Windows Sales**

A majority of ENERGY STAR windows sales were directly to homeowners regardless of retailer type or region. Among program participating retailers, two-thirds (69%) of windows were sold directly to homeowners and 31% were sold to contractors. Breaking out window sales by region, 74% of sales were made directly to DIY homeowners in Rest of Island/Labrador and 62% of sales in Avalon. Non-participant retailers we surveyed indicated that nearly all window sales are direct to homeowners.

**Figure 5-2: Window Sales by Customer Segment**



**Retailers on Thermostat Sales**

Participating retailers sold roughly two thirds of thermostats to DIY homeowners and a third to contractors. DIY homeowner thermostat purchases were slightly more prevalent in Avalon than for participants in Rest of Island/Labrador. Similarly, non-participants reported having a little over twice as many (70%) sales to DIY homeowners than contractors (30%). Figure 5-3 breaks out retailer thermostat sales by customer segment.

**Figure 5-3: Retailer Thermostat Sales by Customer Segment**

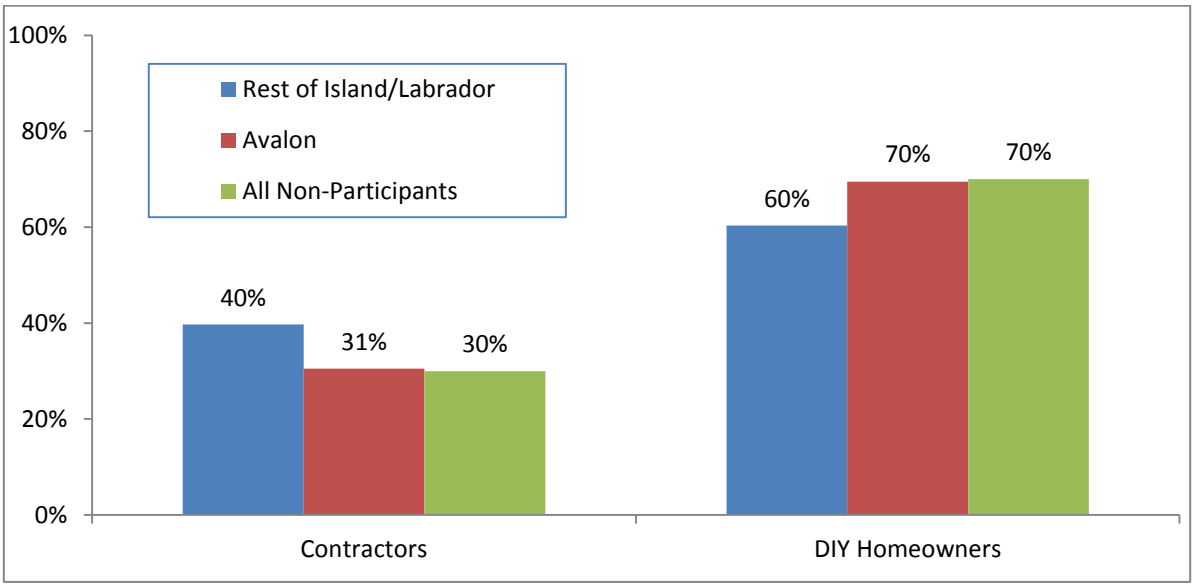
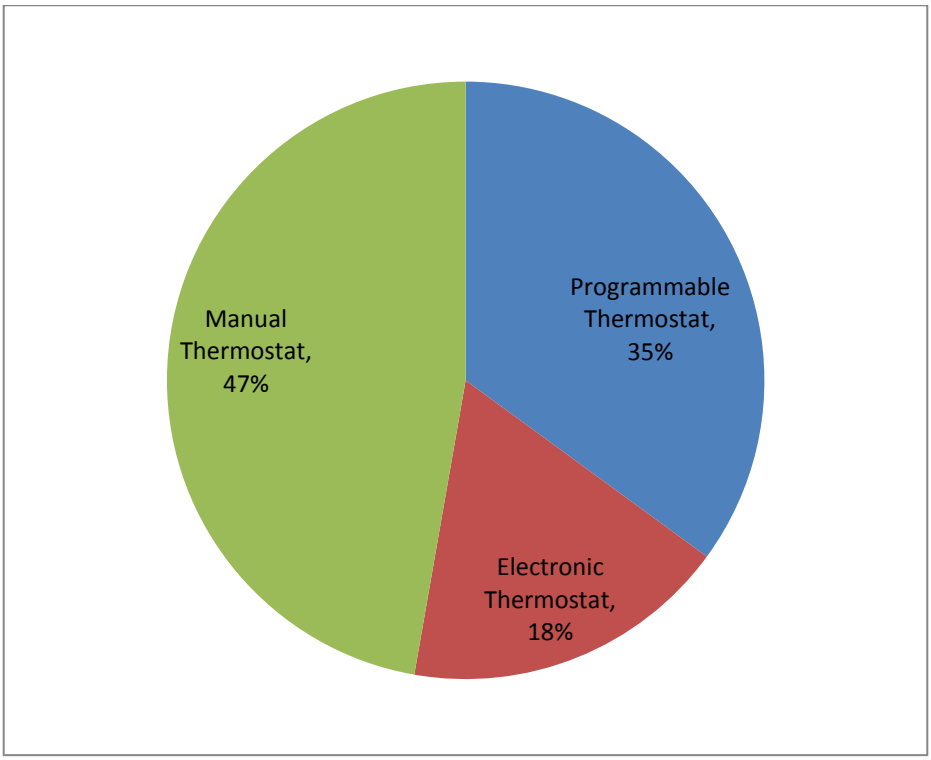



Figure 5-4 presents the distribution of thermostat types participating retailers sell. Participating retailers reported selling more manual thermostats (47%) than programmable (35%) or electronic ones (18%). Non-participant retailers reported a nearly identical trend in sales by thermostat type.

**Figure 5-4: Participating Retailer Reported Sales of Thermostats by Type**




Participating retailers went on to report that standard manual thermostat sales were more prevalent in Rest of Island/Labrador than in Avalon (56% vs. 31% respectively), and electronic thermostats were less prevalent (14%) in Avalon than in the Rest of Island/Labrador region (21%). Non-participating retailers sold the most standard manual kind (58%) along with programmable (28%) and electronic ones (14%). Table 5-5 provides data about thermostat types and sales across the retailer respondent pools.

**Table 5-5: Types of Thermostats Sold Since 2009**

| | Participating Retailers - Rest of Island/Labrador | Participating Retailers - Avalon | Non-participants |
|---|---|---|---|
| n (# of retailers who responded) | 19 | 6 | 3 |
| Programmable | 27% | 55% | 28% |
| Electronic | 16% | 14% | 14% |
| Manual | 56% | 31% | 58% |

**May not sum to total due to rounding.*

## 5.2.2 Program Satisfaction

We asked participating retailers to name what aspects of the *takeCHARGE* program he/she found work well, or are helpful. Among retailers who were able to isolate a particular helpful or effective program component, there were two common response themes. One of the most frequently named program elements that was working well was marketing. Retailers repeatedly named TV Advertising, in-store promotions or coupons, and hand out brochures as effective promotion tools. A secondly commonly mentioned response was that the programs -- or specifically, the incentive programs offered – were working well. Several retailers indicate that the program, or the incentive (or both) has ultimately helped their business through increased sales.

Participating retailers were also asked the inverse question; that is, to name aspects of the *takeCHARGE* program that he or she would like to *change or improve*. Our team summarized their suggestions into three main areas:

- Do more marketing / promotion of the program. A few retailers specifically asked for more in-store promotions.
- Increase or widen available customer incentives. Retailers offered a variety of responses within this topic; some simply wanted customers to get a larger incentive for an energy efficiency measure purchase and installation; other respondents wanted additional measures incented within the program offerings.
- Help with the program rebate form process and/or move to online applications.

### 5.2.3 Program Outreach and Role of Energy Efficiency

**Role of Energy Efficiency**

Both participating and non-participating retailers unanimously confirmed – in both the Avalon and Rest of Island regions -- they perceived ENERGY STAR Windows and high-R value basement insulation incented through the *takeCHARGE* program to be a "good value". Not surprisingly, the same group unequivocally confirmed they plan to continue sales of both measures based on the current market.

Retailers mentioned a number of reasons why ENERGY STAR windows, in particular, were a good value for customers. Factors they mentioned included:

- With rebate they are the same price as standard windows
- Improved household comfort
- Save energy
- Save money on utility bill
- Better R-value
- Less condensation on windows in winter

The same respondents also had a favorable r perception of programmable thermostat value; with over 90% of all retailers said thermostats were a 'good value'. The remaining retailers were unsure about the measure's value or indicated they "don't recommend" programmable thermostats. This finding was consistent across both the Avalon and Rest of Island/Labrador regions.

Retailers who confirmed they thought thermostats were a 'good value' reported a number of reasons why they felt that way. Their value statements included the following:

- *takeCHARGE* rebate offset increased costs of electronic and/or programmable thermostats compared to manual units
- Saves energy when home unoccupied
- Saves energy during night time set-back
- Saves money on utility bills
- More accurate temperature control than manual ones
- Added function of automated control

The non-participant respondent sample size about programmable thermostats was too small to draw reliable conclusions about their measure value perceptions or future sales plans.

**Marketing & Outreach**

As the most direct way of measuring program marketing efforts, we asked participating retailers how they heard about the takeCHARGE program. Avalon retailers most frequently confirmed that a utility representative was responsible for their program knowledge; other methods listed by retailers were direct mail, mass media (such as a TV ad), or some other word of mouth option. Rest of Island/Labrador retailers' answers were often unique, with answers ranging from a Hydro representative to measure manufacturers or corporate store offices.

All of the participating retailers in Avalon and 80% of those in Rest of Island/Labrador confirmed their marketing of the *takeCHARGE* program has increased since 2009; the remainder felt their marketing has kept the same pace. Most of the non-participating retailers surveyed within this evaluation report that their product marketing had increased since 2009.

Participating retailers we surveyed in both Avalon and Rest of Island/Labrador most frequency indicated they used flyers to advertise their services. Mass advertising tools, such as TV, radio, or the yellow pages, were mentioned nearly as frequently. Participating retailers also listed social media (i.e., Facebook) and Word of Mouth as channels it used to advertise.

We asked the retailers we surveyed who sold insulation about the frequency of customer inquiries about insulation in particular. Self-initiated customer inquiries could be one way to measure whether program marketing and outreach were sufficient. Fifty-six percent of retailers overall reported "often" receiving customer inquiries about insulation, 37% do "sometimes" and 7 percent "never" did. About three out of every four Rest of Island/Labrador retailers reported the customer inquiries about insulation happen "often", while about half of participating Avalon retailers reported that level of frequency. Only one non-participant responded to this question and rated their customer inquiry level about insulation retailer at "often". Table 5-6 displays the insulation inquiry frequency by utility.

**Table 5-6: Frequency of Customer Inquiries about Insulation**

| | Rest of Island/Labrador | Avalon | Non-participants |
|---|---|---|---|
| n (# of retailers who responded) | 15 | 6 | 1 |
| Often | 73% | 50% | 100% |
| Sometimes | 27% | 25% | 0% |
| Almost never | 0% | 25% | 0% |

We asked retailers to indicate how satisfied they are with the marketing support provided by the *takeCHARGE* program, connected to the windows/thermostats/insulation they sell. In order to gauge their satisfaction, we asked them to rate it on a scale of 1 to 5 where 5 translates to 'Very Satisfied' and 1 equals 'Very Dissatisfied'. Roughly 90 percent of both Rest of Island/Labrador and Avalon retailers put their satisfaction at a '4' or a '5', indicating a majority of surveyed retailers were indeed satisfied with the program marketing support. However, about 10% of participating retailers indicated rated their satisfaction level at a "3" or lower. The respondents who did not rate their satisfaction a '4' or a '5' put their marketing support satisfaction at a '3', or in neutral territory or gave it a rating of '2' -- or not satisfied. This dissatisfaction articulated by a small share of retailers, however, as with any energy efficiency program there may be room for more marketing.

Finally, we asked retailers if their business helped contractors participate in the *takeCHARGE* program, as part of its program outreach efforts. This was not a popular concept among retailers. Only three of the retailers responded that they had helped contractors.

### 5.2.4 Retailer Motivation for Participation and Non-participation

Retailers almost universally felt there were no identifiable barriers to promoting energy efficient equipment. The few that did identify a promotion disadvantage named the customer education process, program paperwork, or that energy efficiency measures were more expensive. When asked to identify the reasons, if any, residential customers do not purchase *takeCHARGE* program measures; the most frequent barrier was expense.

We asked retailers to get more specific about barriers connected with certain measures. Some participating retailers were able to provide some insight into why a customer might not buy ENERGY STAR Windows. Barriers to an ENERGY STAR Windows purchase listed by retailers include:

- Perception that they are more expensive
- Already have new windows
- Window replacement is for a non-electrically heated home

A small portion of participating retailers indicated that some customers –especially older customers – may have some confusion over how to use thermostats offered through the program.

# 6 MARKET ANALYSIS

## 6.1 Baseline Market Characterization

This section describes the baseline characteristics of the market for basement and attic insulation, ENERGY STAR windows and programmable and electronic thermostats. In addition, it highlights the installation practices taken by customers since 2009. The analysis was based primarily the analysis of the participant and non-participant survey data. Survey data from retailers and contractors was used to corroborate the trends and findings from the customer surveys.

### 6.1.1 Baseline Market for Attic/Crawl Space, Basement Wall and Basement Ceiling Insulation

#### 6.1.1.1 Non-participant Baseline Market - Insulation

Table 6-1 summarizes the type and level of insulation installed in non-participant homes. On average, non-participants have insulated 90% of their attic or crawlspaces, 60% of exterior basement walls and 30% basement ceilings.

Blanket insulation was the most common type of insulation in attics and basement ceilings, 70% and 49%, respectively. The type of insulation used on basement walls was split between blankets (36%) and rigid foam boards (34%). Spray foams and loose fill were used in all three locations of homes but typically accounted for less than 8% of the installations.

The average thickness of the insulation was 8.2 inches for blanket insulation in basement ceilings and 1.9 inches for foam board applied to exterior basement walls and ceilings. The R-value of insulation added to basement walls was R-20 or less for 62% of the non-participants. R-20 to R-30 was the most common insulation range for basement ceiling and attic/crawl space insulation.

**Table 6-1: Insulation in Non-Participant Homes**

| Non-Participants | Exterior Basement Walls | Basement Ceiling | Attic/Crawl Space |
|---|---|---|---|
| **Percent of area insulated (n=212)*** | 60% | 30% | 90% |
| | | | |
| **Type of Insulation** | n=173 | n=109 | n=176 |
| Blanket (batt or roll) | 36% | 49% | 70% |
| Foam Board | 34% | 10% | 2% |
| Spray Foam | 6% | 3% | 7% |
| Loose Fill | 3% | 3% | 16% |
| Don't Know | 23% | 23% | 8% |
| | | | |
| **R-Value** | n=72 | n=56 | n=139 |
| < = R-20 | 62% | 22% | 18% |
| > R-20 to < R-30 | 10% | 37% | 31% |
| R-30 to < R-35 | 0% | 3% | 4% |
| > R-35 | 0% | 4% | 18% |
| Don't Know | 27% | 33% | 29% |
| | | | |
| **Average Thickness of Insulation (Inches)** | n=72 & 64* | n=22 & 11* | n=22* |
| Blanket or Loose Fill | 4.4 | 8.2 | 7.1 |
| Foam Board or Spray Foam | 1.9 | 1.9 | 3.2 |

** n refers to the number of respondents who responded to the question*
*** The first n is the sample size for blanket or loose fill insulation and the second n refers to the sample size for foam board or spray foam respondents.*
****May not sum to total due to rounding.*

Thirty-three percent of non-participant basements were fully heated, 10% partially heated and 40% are not heated at all. Basements in the Avalon region were more likely (70%) to be heated for non-participants than they were for the Rest of Island (30%) and Labrador (60%). Non-participants over 40 years old were more likely to have an unheated basement than younger homeowners under the age of 40 (7%).

Analysis of the survey data identified several statistically significant results among the non-participants.

- While basement ceiling and basement wall insulation accounted for the largest share of insulation in all three regions, it was highest in the Avalon area (80%) compared to non-participants in Labrador (60%) and Rest of Island (50%).
- Homes built prior to 1980 were less likely (50%) to have basement wall insulation compared to newer homes. Seventy percent of the homes built between 1981 and 2008 had some type of wall insulation while 90% of the homes built after 2008 had basement wall insulation. The high incidence level of basement wall insulation in new homes reflected the implementation of the new building codes.
- Basement wall insulation was most prevalent in larger homes with square footage greater than 2,500 square feet (80%) compared to midsized homes (1,000-2,500 square feet) and small homes (<1,000 square feet), 60% and 50% respectively.

- Over half of the non-participants who did not know whether or not their basement walls were insulated felt that the current insulation levels were adequate.
- Homes in Avalon had basement wall insulation that is on average one inch thicker (4.9 inches) than homes in Labrador and the Rest of Island.
- Non-participants who were under the age of 40 had an average of 14 inches of basement ceiling insulation which was twice the thickness reported by non-participants over the age of 40.
- Attic insulation in Labrador homes was less thick (5.1 inches) than for homes in Avalon (7.9 inches) and the Rest of Island (7.4 inches).
- Homes built before 1980 had less attic insulation (5.8 inches) than homes built from 1981 to 2008 (7.9 inches) and newer homes built after 2008 (9.5 inches).

Since the *takeCHARGE* Insulation Rebate Program was offered in 2009, non-participants were asked about their basement and attic insulation purchases made beginning in 2009 through 2012. Of the non-participant insulation installations, 57% were for the attic, 29% for the basement wall and 17% for the basement ceiling.

**Table 6-2: Location of Non-Participant Insulation Installations**

| Non-Participants | Type of Insulation (n=43) |
|---|---|
| Attic insulation | 57% |
| Basement wall insulation | 29% |
| Basement ceiling insulation | 17% |
| Don't Know | 12% |
| REFUSED | 7% |

* *n refers to the number of respondents who responded to the question.*

For non-participants, attic or crawl space installation was the most common type of insulation purchase across the three regions. Furthermore, it had the highest share in the Rest of Island region. Attic was more prevalent in Rest of Island (72%) than in both Avalon itself (53%) and Labrador (13%).

### 6.1.1.2 Participant Baseline Market - Insulation

The majority of *takeCHARGE* participants, 77%, stated that there were no remaining opportunities to install additional insulation in their attics, basement walls and basement ceilings. However, there remained opportunities for attic insulation among 10% of the participants of those participants, 36% had previously participated in the insulation program, 26% in the ENERGY STAR windows program and 36% in the programmable thermostat program.

When asked if any opportunities for installing basement insulation in their homes existed, 13% of participants responded yes. Of these participants, over half of the respondents (51%) were *takeCHARGE* insulation participants while 34% had participated in the thermostat program and 15% in the ENERGY STAR window program.

For both attic and basement insulation, participants cited the cost (26%), timing of installation would be inconvenient (27%) or other (32%) as the primary reason for not installing the additional measures. Cost consideration was statistically significant among insulation program participants. Table 6-3 shows the breakout of responses.

**Table 6-3: Reasons Participants Did Not Install Additional Measures**

| Reason for Not Installing Additional Measures | n=94 |
|---|---|
| Could not afford to do more/ran out of money | 27% |
| Was not convenient to do the measure at that time | 26% |
| Did not think the savings justified the costs | 6% |
| Did not fit with other aspects of the overall project | 5% |
| The rebate application was complicated/lengthy to complete | 3% |
| Other | 32% |
| Don't Know | 1% |

** n refers to the number of respondents who responded to the question.*
****May not sum to total due to rounding.*

### 6.1.1.3 Insulation Baseline Market – Retailer/Contractor Perspective

Sales of insulation products among participating retailers corroborated the installation trends among both participants and non-participants. Of the 32 participating retailers interviewed, 23 provided information regarding the type of insulation products sold. Participating retailers reported selling a variety of types of insulation with blanket and foam board being the most common across both the Rest of Island/Labrador and Avalon regions with no virtually not differences between the two regions. Only one non-participating retailer provided information about the type of insulation sold and reported selling only blanket type of insulation.

**Table 6-4: Types of Insulation Sold by Retailers**

| Types of Insulation Sold | All Participating Retailers (n=23) |
|---|---|
| Blanket | 83% |
| Foam board | 75% |
| Loose fill | 50% |
| Spray | 29% |

** n refers to the number of respondents who responded to the question.*

Similarly trends patterns existed between the Rest of Island/Labrador region and the Avalon region regard the R-values of the insulation. The most common R-value of the insulation sold by participating was R-20 (41%). Five percent of insulation sold by participatants was less than R12 and 14% was greater than R-20. The one non-participating retailer mostly (80%) sold rolls of insulation that are about R-20. Again, the small sample sizes limit the ability to generalize the findings for both participating and non-participating retailers to the population.

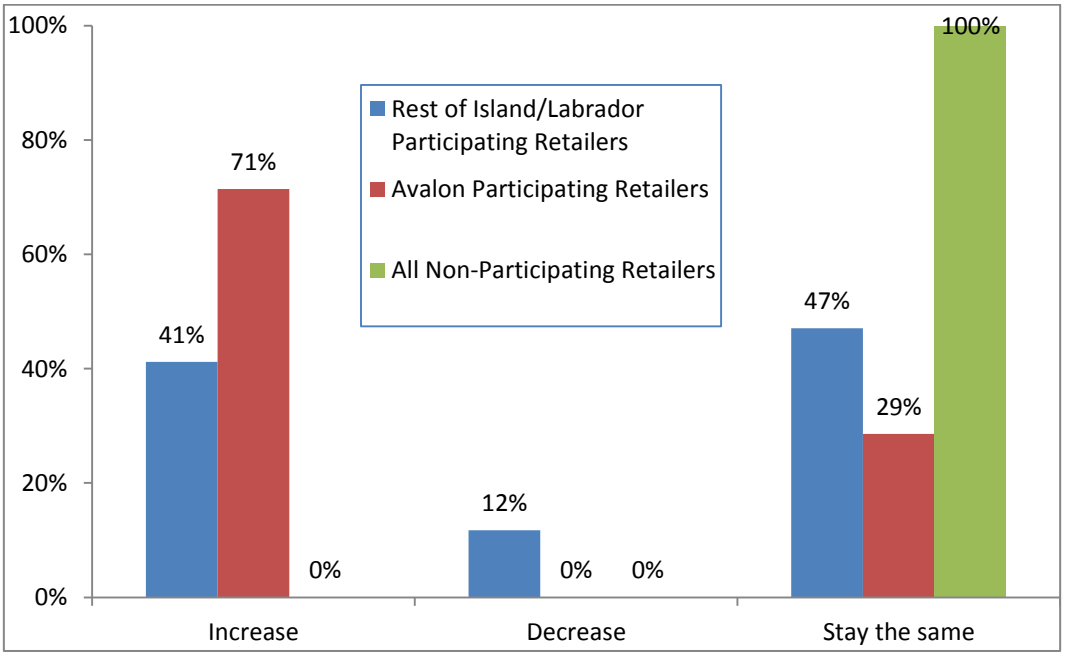
**Table 6-5: R-value of Insulation Sold by Retailers**

| R-Value | All Participants (n=23) | All Non-Participants (n=1) |
|---|---|---|
| < R-12 | 5% | 0% |
| R-12 | 6% | 0% |
| > R-12 to< R-20 | 16% | 0% |
| R-20 | 41% | 80% |
| > R-20 to < R-25 | 4% | 0% |
| > R-25 | 10% | 0% |

** n refers to the number of respondents who responded to the question.*
****May not sum to total due to rounding.*

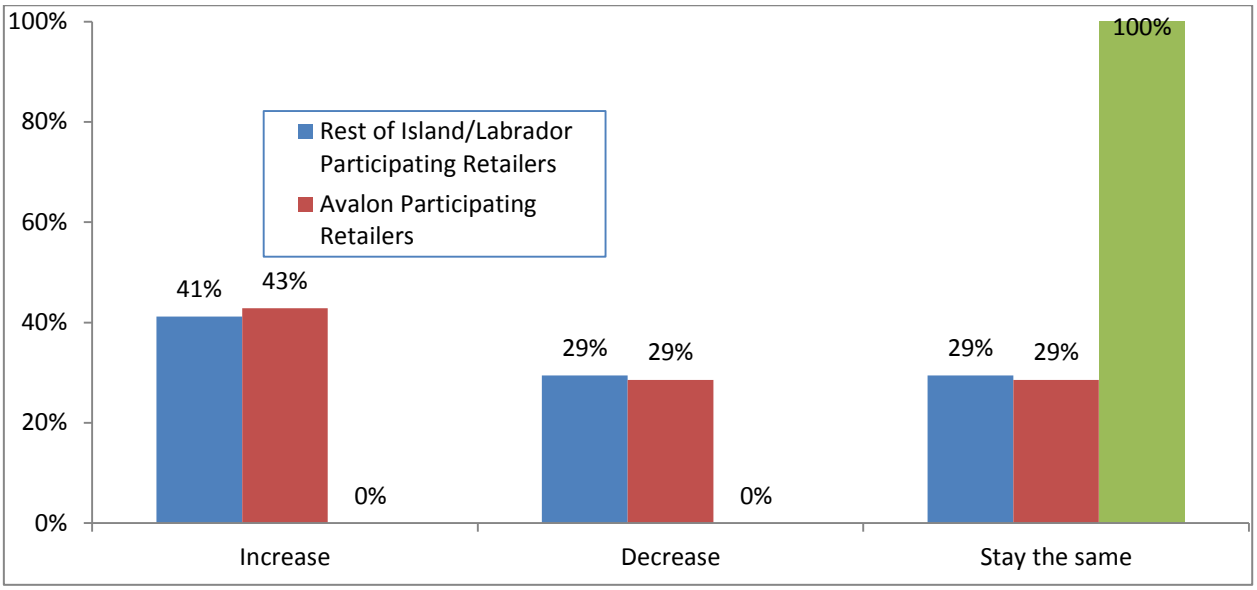
Differences among the change in insulation sales to contractors differed among the two regions. Participating retailers in Rest of Island/Labrador were fairly split between seeing an increase in market share sales and no change in market share. However, in Avalon, 71% or respondents indicated an increase in market share while only 29% saw no change. The one non-participating retailer that sells insulation reported sales to be unchanged since 2009.

**Figure 6-1: Insulation Market Share to Contractors Since 2009**




Over 40% of participating insulation retailers in both regions reported that the market share to DIY customers increased, nearly 30% reported that it decreased and the remaining 30% said that it remained the same. The one non-participating retailer who sells insulation reported that sales to DIY customers were unchanged since 2009.

**Figure 6-2: Insulation Market Share to DIY Customers Since 2009**




Ninety-five percent of participating retailers think that current insulation sales trends will continue into the future and the remaining 5 percent are unsure. Similarly the non-participant thought current sales trends would continue.

## 6.1.2 Baseline Market for Windows

### 6.1.2.1 Non-participant Baseline Market - Windows

Non-participants were asked about the type of window and window frames installed in their homes. Non-participants had on average 12.2 windows in their homes. The number of windows was not statistically different across the three regions. When asked about the percentage of windows in their homes that were single pane only 8% stated that had some single pane windows in their homes while 73% of respondents stated that none of their windows were single pane. Furthermore, 75% on non-participants had at least one double pane window and 59% of those respondents had 100% double pane windows.

**Table 6-6: Window Type for Non-Participants**

| Window Characteristic | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Average Number of Windows | 12.2 | 13.6 | 10.9 | 12.7 |
| Type of Window - *Single Pane* | 8% | 7% | 9% | 7% |
| Type of Window - *Double Pane* | 75% | 73% | 79% | 72% |

**May not sum to 100% because customers may have responded OTHER or DO NOT KNOW to the question.*

The type and mix of double pane windows varied across respondents. The respondents were asked about the percentage of windows in each of the following categories: Gas filled, UV coated or low e and ENERGY STAR. Since some gas filled or UV coated windows also qualify as ENERGY STAR windows, the respondents reported the percentages for these windows in both the response categories. Table 6-7 shows the penetration range for each window type. For ENERGY STAR windows, nearly a quarter of non-participants indicated that none of their windows were ENERGY STAR windows. Over half of the non-participants, 55%, resided in homes with all ENERGY STAR windows. Overall, ENERGY STAR windows account for 57% of the windows among non-participants.

**Table 6-7: Window Type Penetration for Non-Participants**

| Percentage of Windows | Gas Filled | UV Coated | ENERGY STAR Certified |
|---|---|---|---|
| 0% (No windows) | 47% | 52% | 23% |
| 100% (All windows) | 39% | 25% | 55% |
| Average % of windows | 33% | 23% | 57% |

**May not sum to total due to rounding.*

Non-participants were asked about their purchasing patterns for windows since the *takeCHARGE* programs were offered in 2009. Over 35% of non-participants bought new windows since 2009 and purchased an average of 4.6 windows. Table 6-8 shows the distribution of the number of windows purchased by non-participants.

**Table 6-8: Number of Windows Purchased by Non-Participants**

| Number of Windows Purchased Since 2009 | n=75 |
|---|---|
| < = 5 | 38% |
| 6 to 10 | 32% |
| 11 to 15 | 14% |
| >15 | 13% |
| Don't Know | 2% |
| Average # of Windows | 4.6 |

**May not sum to total due to rounding.*

These respondents were then asked about the type of windows they purchased since 2009. Double pane windows accounted for the majority of the respondents' purchases and 45% of respondents purchased ENERGY STAR windows. Table 6-9 shows the type of windows purchased by non-participants since 2009.

**Table 6-9: Type of Windows Purchased by Non-Participants Since 2009**

| Type of Window | n=75 |
|---|---|
| Double pane | 74% |
| ENERGY STAR | 45% |
| Gas filled | 30% |
| UV coated | 11% |
| Other | 4% |
| Don't Know | 3% |

**May not sum to total due to rounding.*

Vinyl frames were the most common type of window frame for 89% of non-participants.

### 6.1.2.2 Participant Baseline Market - Windows

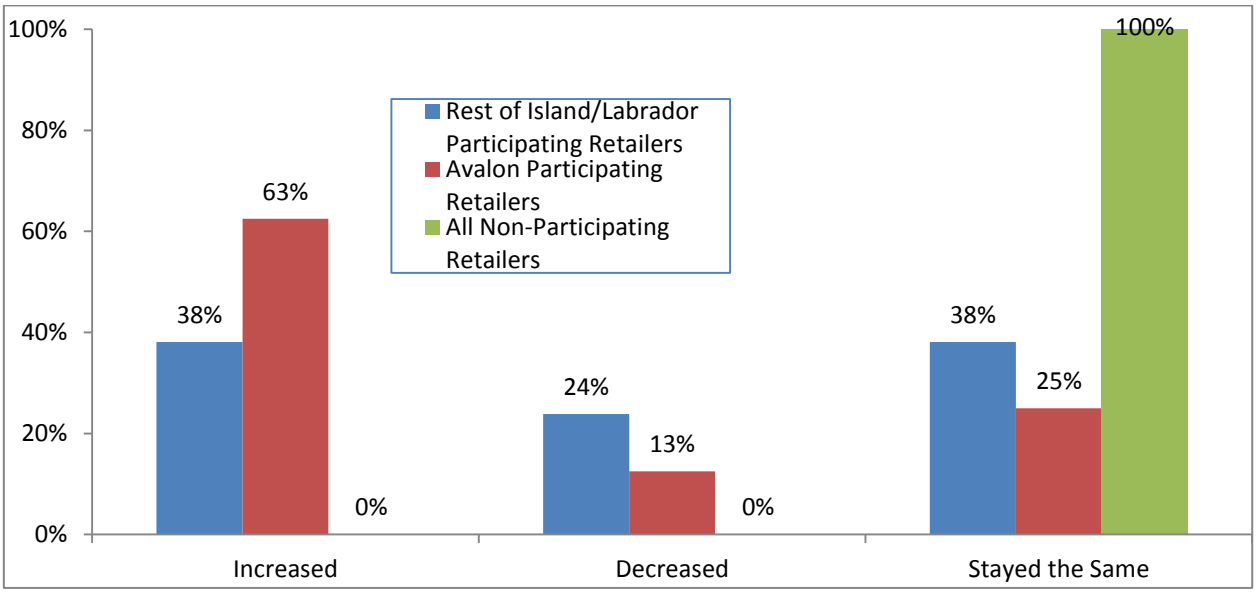
All *takeCHARGE* program participants were asked if there were any remaining opportunities to install ENERGY STAR windows in their homes. Of the 151 participant respondents, 27% of participants indicated there were additional opportunities for ENERGY STAR windows. Of those respondents, the majority of the participants were in Avalon 65%. Only 1% of participants with remaining opportunities resided in Labrador. Given the small number of respondents, the results were not statistically significant at either the 90% or 95% confidence level.

Furthermore, 21% of the participants with additional opportunities had previously participated in the *takeCHARGE* ENERGY STAR Windows Program. Insulation participants accounted for 46% of the respondents and thermostat participants represented the remaining 33%. The major reasons for not installing additional measures were cost and the inconvenience associated with the project.

### 6.1.2.3 Windows Baseline Market – Retailer/Contractor Perspective

Retailers were asked about the changes in window sales since 2009. In general the trends and sales patterns were consistent with the information reported by participating and non-participating customers. Overall window sales to contractors were reported to have increased since the program was launched in 2009 for 63% of participating retailers in Avalon. This finding was consistent with the purchasing patterns reported by contractors. However, only 38% of participating retailers saw an increase in sales to contractors. Figure 6-3 shows the changes in sales to contractors. Some retailers in both rest of Island/Labrador and Avalon report a decline in contractor sales, 24% and 13% respectively. Windows sales to contractors were unchanged for the non-participating retailer.

**Figure 6-3: Window Sales Volume to Contractors Since 2009**




About half (53%) of participating retailers believed that the share of windows sales to DIY homeowners) increased since 2009, 22% stated it was the same and 24% indicated a decline. These proportions held across the two utilities for participants. Sixty-seven percent of non-participants who sell windows said the DIY market share was the same and 33 percent said it decreased. The responses from this small sample did not necessarily reflect the trends experienced by the population of participating and non-participating retailers.

Two-thirds of window sales were ENERGY STAR certified according to participating retailers. Participants in the Avalon/Rest of Island report selling ENERGY STAR certified windows at about twice the rate (78%) as Labrador retailers (40%). Participating retailers reported selling more (24%) double pane windows than single pane (4%) ones. Non-participating retailers that sell windows report selling fewer (33%) ENERGY STAR windows, but still sell 80 percent that are gas-filled, and thereby necessarily also multi-paned. Table 6-10 shows the distribution by window type.

**Table 6-10: Types of Windows Sold by Retailers Since 2009**

| Percentage of Window Type Sold | NP Participating Retailers (n=17) | Hydro Participating Retailers (n=11) | All Participating Retailers (n=28) | All Non-Participating Retailers (n=3) |
|---|---|---|---|---|
| ENERGY STAR Certified | 78% | 40% | **67%** | **33%** |
| Double Pane | 26% | 36% | **29%** | **33%** |
| Gas Filled | 23% | 28% | **24%** | **80%** |
| Single Pane | 5% | 0% | **4%** | **0%** |
| UV Coated | 0% | 0% | **0%** | **0%** |

** n refers to the number of respondents who responded to the question.**

***Total sums to more than 100% because respondents some windows have more than one characteristic. Such is the case with ENERGY STAR windows since most are also double pane, and it's likely that none are single pane.*

## 6.1.3 Baseline Market for Thermostats

### 6.1.3.1 Non-participant Baseline Market - Thermostats

Non-participants were asked about the quantity and type of thermostats in their homes. Table 6-11 shows the distribution of thermostats across the regions. Overall, the average number of thermostats in non-participants' homes was 7.7. Standard thermostats were cited as the most common type across all three regions, followed by electronic thermostats. Avalon respondents reported a larger number of thermostats across all types which were statistically significant different from the results reported for the Rest of Island and Labrador respondents. The responses from this small sample did not necessarily reflect the trends experienced by the population of participating and non-participating customers.

**Table 6-11: Average Number Thermostat Types by Region**

| Thermostat Type | All Regions | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Manual (n=127) | 7.0 | 8.4 | 6.2 | 6.9 |
| Programmable (n=212) | 1.6 | 2.1 | 1.3 | 1.4 |
| Electronic +/- 5 Degrees Celsius (n=180) | 2.5 | 3.5 | 1.6 | 2.9 |
| Average Total Number of Thermostats Per Home (n=212) | 7.7 | 8.9 | 6.7 | 7.9 |

** n refers to the number of respondents who responded to the question.*

Non-participants reported setting their thermostats at 21.3 °C when a room was occupied and 15.6 °C when it was unoccupied. Respondents' homes were on averaged unoccupied for 7.2 hours each day during the work week. The majority of non-participants with programmable thermostats, 62%, did use the thermostat to automatically adjust the temperature settings while only 29% utilized the automatic programming features.

Since the *takeCHARGE* Thermostat Program was offered in 2009, 37% of non-participants purchased new thermostats buying an average of 2.5 thermostats.

Table 6-12 shows the quantity of thermostats purchased by non-participants. Since 2009, programmable thermostats followed by electronic thermostats were the most commonly purchased units.

**Table 6-12: Quantity and Type of Thermostats Purchased**

| Number of Thermostats | Programmable (n=76) | Electronic thermostats +/- 0.5 degrees Celsius (n=76) | Manual (n=76) | Other (n=76) |
|---|---|---|---|---|
| 0 | 38% | 51% | 54% | 92% |
| 1 | 22% | 12% | 11% | 0% |
| 2 to 5 | 24% | 3% | 10% | 1% |
| 6 to 10 | 8% | 2% | 8% | 0% |
| >10 | 8% | 6% | 1% | 1% |
| Don't Know/Refused | 6% | 7% | 3% | 6% |
| Average # Purchased | 2.5 | 1.9 | 1.7 | 0.1 |

** n refers to the number of respondents who responded to the question.*

**May not sum to total due to rounding.*

### 6.1.3.2 Participant Baseline Market - Thermostats

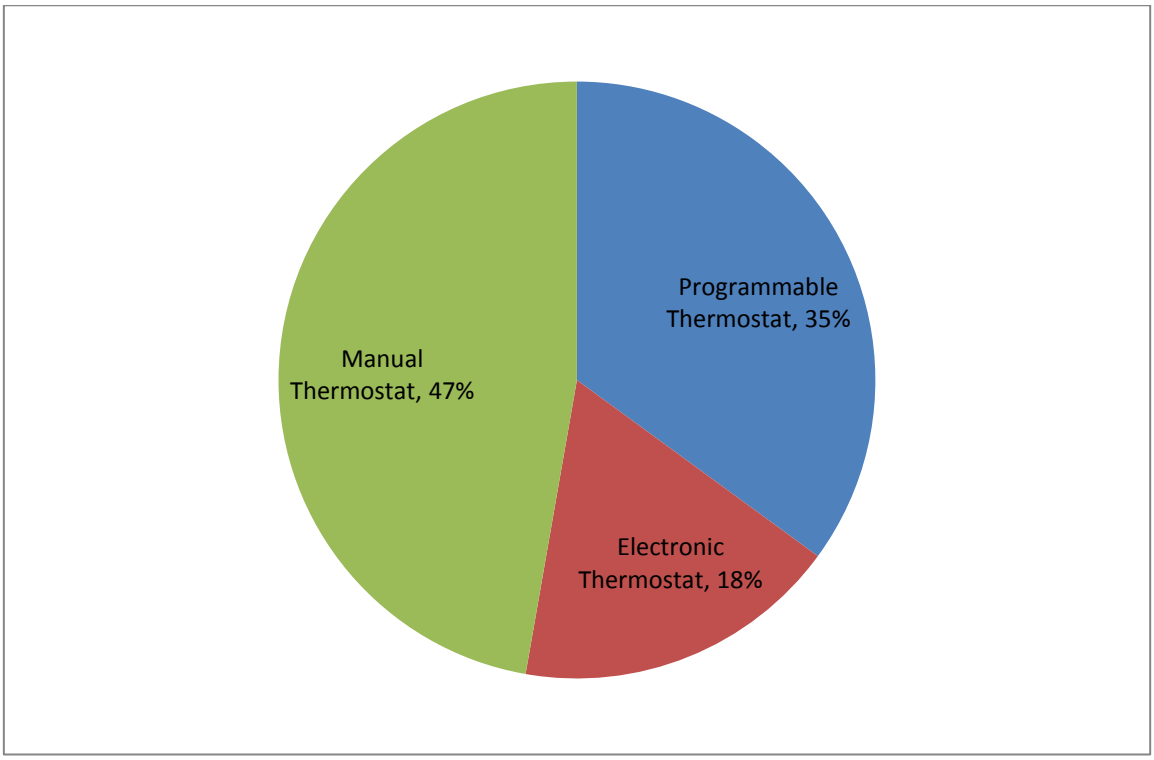
*takeCHARGE* program participants were asked about the remaining opportunities for programmable and electronic thermostats and their purchasing behavior outside of the program. Twenty eight percent of participants report additional opportunities to install programmable or electronic thermostats in their homes. Labrador participants indicated that there were no additional opportunities for programmable or electronic thermostats. This finding contradicts the market perspective of participating retailers in the region. Participating retailers stated that manual thermostats were prevalent and offered a potential savings opportunity. This discrepancy in self-reported data may warrant further research by the Utilities.

Furthermore, 40% of the window program participants and 32% of the respondents were previous thermostat participants. Both of these findings were statistically significant at the 95% level. The responses from this small sample did not necessarily reflect the trends experienced by the population of non-participant customers.

### 6.1.3.3 Thermostat Baseline Market – Retailer/Contractor Perspective

Overall, participating retailers reported selling more standard thermostats (47%) than programmable (35%) or electronic ones (18%) (See Figure 6-4 below). For non-participating retailers the break-out was similar; 58 percent standard, 28 percent programmable and 14 percent electronic.

**Figure 6-4: Participating Retailer Reported Sales of Thermostats by Type**




For participating retailers, manual thermostat sales were more prevalent in the Rest of Island/Labrador region than in Avalon 56% vs. 31% respectively, and electronic thermostats were slightly less prevalent (14%) in the Avalon than Rest of Island/Labrador (16%). Non-participating retailers sold the most standard manual kind (58%) along with programmable (28%) and electronic ones (14%) as shown in Table 6-13. These results were based upon a small number of respondents and may not be reflective of the population participating and non-participating retailers.

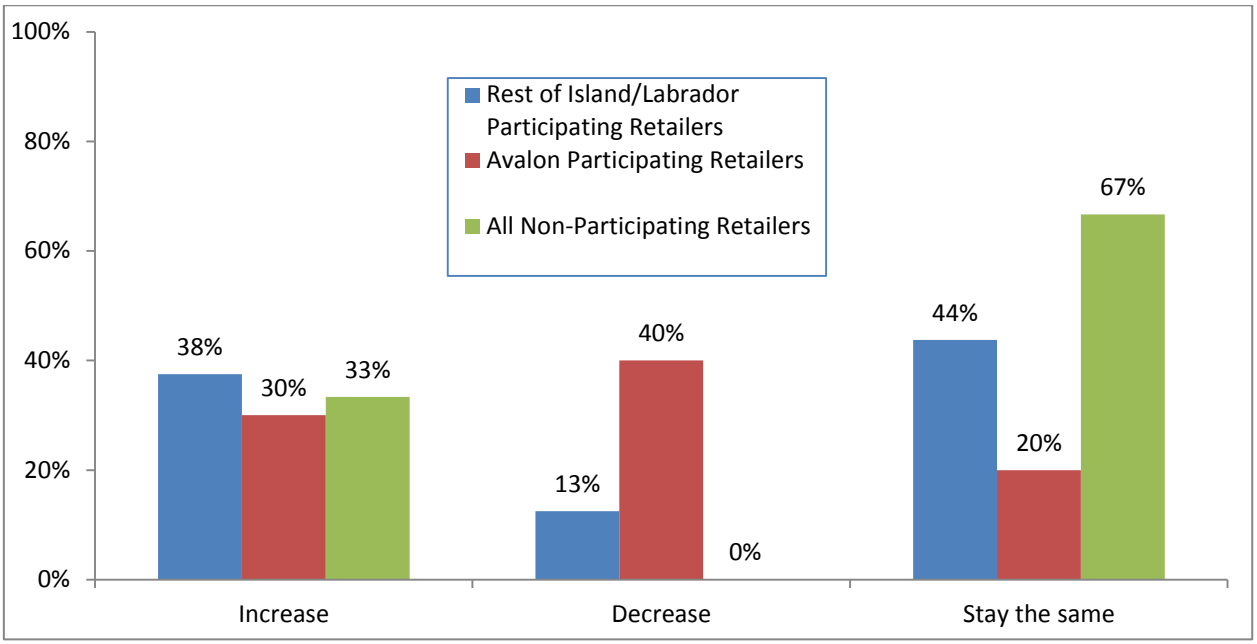
**Table 6-13: Types of Thermostats Sold by Retailers Since 2009**

| Types of Thermostats | Rest of Island/Labrador Participants (n=19) | Avalon Participants (n=6) | All Non-Participants (n=3) |
|---|---|---|---|
| Programmable | 27% | 55% | 28% |
| Electronic | 16% | 14% | 14% |
| Manual | 56% | 31% | 58% |

** n refers to the number of respondents who responded to the question.*
***May not sum to total due to rounding.*

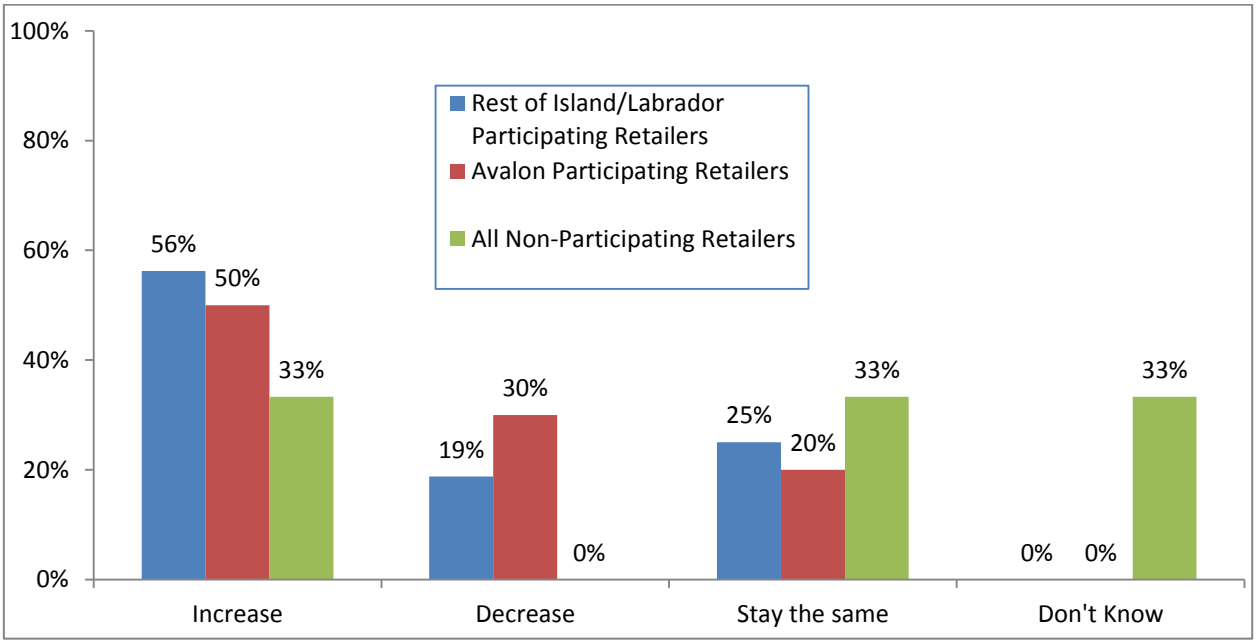
Among participating retailers, 35% reported that thermostat sales were on the upswing since 2009, 20% report a decrease and 37% reported this being unchanged. Thirty-eight percent of Newfoundland Power's participating retailers reported an increase in thermostat sales and only 13% report a decrease. The inverse was the case in Hydro's service territory with only 30% of participants reporting an increase, and 40% reported a decrease since 2009. Similarly, 30% of non-participants report an increase in thermostat market share to contractors and the remaining (70%) report that it is unchanged since 2009, as shown in Figure 6-5.

**Figure 6-5: Thermostat Market Share to Contractors Since 2009**




Fifty-five percent of participating retailers reported an increase in thermostat sales to DIY homeowners, 21 reported a decrease and 24 percent said that it has stayed the same since 2009. Even though participants in both service territories reported an increase in thermostat sales to DIY homeowners, more NP area retailers reported an increase than do Hydro area participants (56% vs. 50%). An equal percent (33% for each) of non-participating retailers reported that thermostat DIY homeowner market share had; increased, stayed the same and "did not know" as shown in Figure 6-6.

**Figure 6-6: Thermostat Market Share to DIY Homeowners Since 2009**




Ninety-three percent of participating retailers and 67 percent of non-participants said that programmable thermostats or efficient electronic thermostats are a "good value" for their residential customers.

Most participating retailers (85%) and non-participating ones (67%) feel that current thermostat sales trends will continue into the future based on their understanding of the current market. No one (0%) said that current sales trends would not continue, however 9% of participants and 33 % of non-participants were unsure. Ninety-one percent of participants report more marketing of thermostats and 9 percent of participants report that the frequency of marketing is unchanged since 2009. Similarly, 80% of non-participating retailers said their thermostat marketing has increased and 20% said that it is about the same since 2009.

## 6.2 Attribution Analysis

This section focuses on the actions taken by customers that can be attributed to the *takeCHARGE* programs. DNV GL relied on participant and non-participant survey data to develop estimates of free-ridership and spill over for each of the three *takeCHARGE* programs. Information collected through the contractor and retailer interviews were used to corroborate the findings from the survey data.

Free ridership is defined as the percentage of program savings that were incurred by participants who would have installed the measure in absence of the program. There are three components of free ridership that are analyzed and weighted to create an estimate of free ridership:

- Overall likelihood of purchasing the measure without the program
- The effect that that program had on the timing of the purchase of the measures
- The influence of the program on the quantity of measures purchased

The term "spill over" refers to a range of potential effects of energy efficiency programs. There are two types of spill over effects:

- **Participant spill over.** Participant spill over occurs when customers who have received financial and/or technical support for adopting an energy efficiency measure later purchase and install similar measures without using program incentives or services. To be counted as program effects, there must be some evidence that the customers in question took these actions as a result of their earlier participation in the program**.**
- **Nonparticipant spill over.** Nonparticipant spill over occurs when customers who have not participated in a program adopt the energy efficiency measures that the program supports as a result of the program. This could result from exposure to program-related public relations, vendor promotions, or word-of-mouth about the program and the benefits of efficiency measures.

### 6.2.1 Free-ridership

The free-ridership analysis focused on three aspects of participants' purchasing behavior to discern the influence of the program in the implementation of the programs' measures, specifically:

- Overall likelihood of purchasing the measure without the program
- The effect that that program had on the timing of the purchase of the measures
- The influence of the program on the quantity of measures purchased

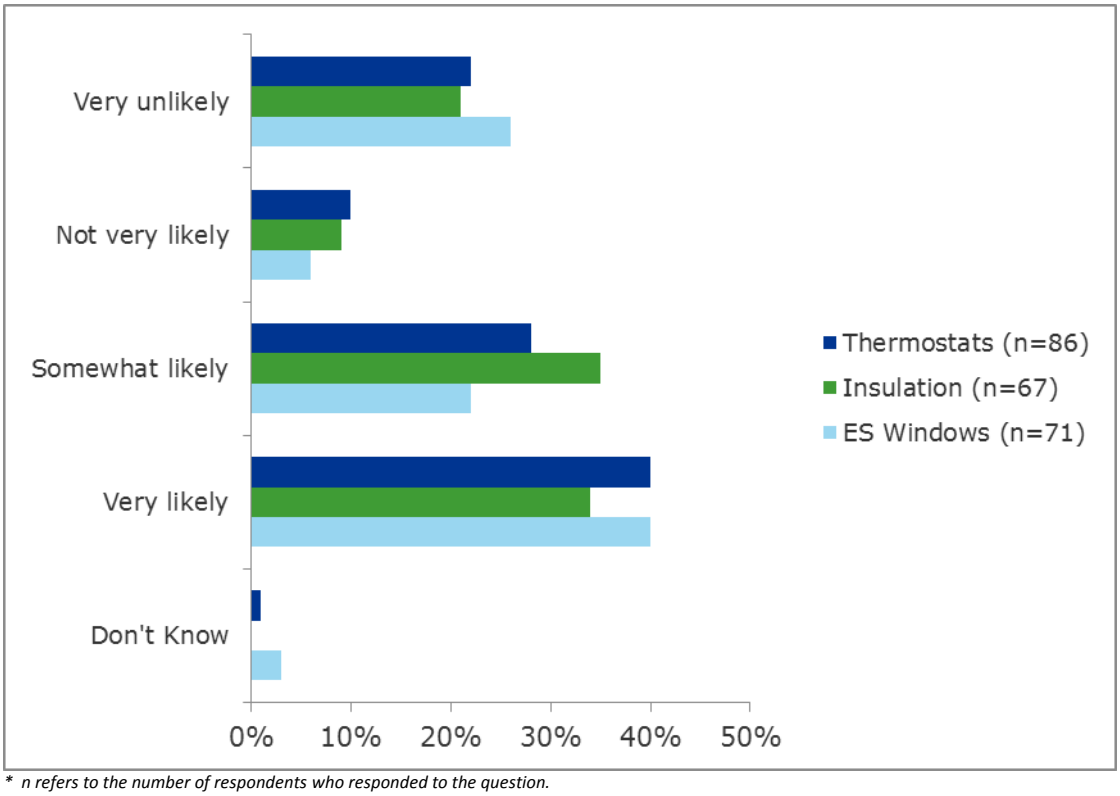
The responses for all three effects were weighted together to create an estimate of free-ridership by program.

#### 6.2.1.1 Likelihood of Participation

Program participants were asked what the effect of the program was on their decision to install ENERGY STAR windows, attic and basement insulation and programmable thermostats. They were asked how likely or unlikely they would have been to install these energy efficiency measures if they had not received the incentives (rebates) from the programs. Sixty-one percent of ENERGY STAR window

participants, 69% of basement and attic insulation program participants and 67% of thermostat program participants said that they would have either been "very likely" or "somewhat likely" to have installed measures without program incentives. Figure 6-7 shows the responses by program.

**Figure 6-7: Likelihood of Installing Measures Without the Program**




** n refers to the number of respondents who responded to the question.*
***May not sum to total due to rounding.*

There were several statistically significant differences (at 90% level or higher) in who would and would not have installed measures without program incentives.

- ENERGY STAR Windows:
  - The program rebate was particularly important to those not living in single family homes as 85% said that the rebate was very important in their decision to install ENERGY STAR windows, compared to only 15% of single family home participants.
  - The rebate was more important to ENERGY STAR window participants who have a high school or less education (44%) compared to 8% of participants with some college, 10% with a college degree and 26% with a graduate degree.
  - Lower income participants who made less than $60k per year were more unlikely to have installed ENERGY STAR windows, 58%, compared to only 28% of participants with annual incomes between $60 and $100,000 and 20% of high income earners with incomes exceeding $100,000.
  - All participants with homes under 1,000 square feet indicated they would have installed ENERGY STAR windows without the rebate. The likelihood of installing the ENERGY STAR windows decreased as home size increased: 41% for midsized homes (1000-2500 ft2) and 37% of large homes (over 2500 ft2).
- Programmable and Electronic Thermostats

- Thirty nine percent of single family homes indicated that they were very likely to install programmable thermostats in the absence of the program and all of those respondents were very likely to have installed programmable thermostats without a rebate.
- All insulation program participants who lived in smaller homes (<1000 ft2) stated that they would have a programmable/electronic thermostat in the absence of the program compared to participants living in midsized homes (70%) and larger homes over 2500 ft2 (54%).
-

- Insulation Participants
  - Among insulation participants,60% of participants who were less likely to have installed insulation without the programs indicated that they were either very likely or somewhat likely to participate in future programs..

### 6.2.1.2 Timing of Purchasing Measures

Participants were asked about the effect of rebates on the timing of their purchase of ENERGY STAR windows, basement insulation or programmable thermostats. The insulation program rebates appeared to be the most effective at driving earlier purchases. Forty four percent of insulation participants accelerated the timing of their purchases compared to 11% of ENERGY STAR window program participants and 32% of thermostat program participants. Thirteen percent of thermostat program participants and 6% of ENERGY STAR window program participants and basement insulation program participants would never have installed these energy saving items without the program rebate. Less than 5% of participants in each of the three programs said they would have bought earlier as shown in Table 6-14.

**Table 6-14: Program Effect on Timing of Purchases**

| Timing | ENERGY STAR Windows (n=71) | Insulation (n=67) | Programmable/ Electronic Thermostats (n=86) |
|---|---|---|---|
| At the same time | 74% | 46% | 47% |
| Earlier | 5% | 3% | 4% |
| Later | 11% | 44% | 32% |
| Never | 6% | 6% | 13% |
| Don't Know/Refused | 5% | 1% | 5% |

** n refers to the number of respondents who responded to the question.*
***May not sum to total due to rounding.*

The majority of program participants who indicated that they would have purchased the measures later stated that they would have purchased the measures within the next year. Table 6-15 shows the distribution of responses.

**Table 6-15: Number of Months Later Measures Installed in Absence of the Program**

| Number of Months Later | ENERGY STAR Windows (n=7) | Insulation (n=30) | Programmable/ Electronic Thermostats (n=28) |
|---|---|---|---|
| 0-12 months | 100% | 67% | 60% |
| 13-24 months | 0% | 20% | 17% |
| Over 24 months | 0% | 4% | 8% |
| Don't Know | 0% | 8% | 15% |

### 6.2.1.3 Effect of Program on Quantity Purchased

Program participants were asked about the effects of the program on the quantity of measures they would have purchased in the absence of the program incentives. Over 75% of the ENERGY STAR window program participants, 62% of insulation program participants and a little over half (55%) of thermostat participants stated they would have purchased the same quantity of energy savings measures without rebates. However, 16% of thermostat program participants along with 11% of ENERGY STAR window participants and 7% of insulation program participants would not have purchased any measures without the rebate. Also, 26% of the insulation participants, 25% of the thermostats participants and 7% of the ENERGY STAR participants would have installed fewer measures without the program.

One statistically significant difference among ENERGY STAR windows participants was found. The program appears to have impacted the likelihood that no ENERGY STAR windows would have been purchased among lower income folks the most. As 35% of households earning under $60k per year would not have purchased any windows at all, compared to only 9% of middle income earners ($60-100k) and 3% of upper income earners (earning over 100k).

### 6.2.1.4 *takeCHARGE* Free Ridership Estimates

The first step in the calculation of the free ridership estimates was to classify to each response of the free ridership questions as a free rider, partial free rider or not a free rider. For example, if a participant responded that they were very likely to install the measure in the absence of the *takeCHARGE* rebate, they would be considered a 100% free rider. Conversely, if a participant stated that they were very unlikely to install the measure without the rebate, they were classified as not a free rider or 0% free rider. Some participant behavior may be partially influenced by the rebate offer but not entirely; these types of participants are considered a partial free rider. For example, if a participant said that they were somewhat likely to install the measures, they were considered a 50% free rider. Table 6-16 shows the free ridership questions from the participant survey and the free ridership classification for the responses.

**Table 6-16: Free Ridership Responses**

| Question | Response Categories | Free-ridership Weight | ENERGY STAR Windows | # of Respondents | Programmable and Electronic Thermostats | # of Respondents | Basement and Attic/Crawl Space Insulation | # of Respondents |
|---|---|---|---|---|---|---|---|---|
| Likelihood of installing the measure without the *takeCHARGE* rebate | # of respondents | | | 71 | | 67 | | 86 |
| | Very likely | 100% | 40% | 28 | 34% | 23 | 40% | 34 |
| | Somewhat likely | 50% | 22% | 8 | 35% | 12 | 28% | 12 |
| | Somewhat unlikely | 25% | 6% | 1 | 9% | 2 | 40% | 9 |
| | Very unlikely | 0% | 26% | 0 | 21% | 0 | 22% | 0 |
| Timing of the purchase of the measure without the *takeCHARGE* rebate | # of respondents | | | 71 | | 67 | | 86 |
| | Same time | 100% | 74% | 53 | 46% | 31 | 47% | 40 |
| | Earlier | 100% | 5% | 4 | 3% | 2 | 4% | 3 |
| | Later | 25% | 11% | 2 | 44% | 7 | 32% | 7 |
| | Never | 0% | 6% | 0 | 6% | 0 | 13% | 0 |
| Confirm unlikely to purchase the measure AND timing of purchase was not affected | # of respondents | | | 16 | | 6 | | 7 |
| | Yes | 0% | 66% | 0 | 100% | 0 | 100% | 0 |
| | No | 50% | 34% | 8 | 0% | 3 | 0% | 4 |
| Number of months earlier that the purchase would have been made | # of respondents | | | 7 | | 30 | | 28 |
| | 0-12 months later | 100% | 100% | 7 | 67% | 20 | 60% | 17 |
| | 13-24 months later | 50% | 0% | 0 | 20% | 2 | 17% | 1 |
| | >24 months later | 0% | 0% | 0 | 4% | 0 | 8% | 0 |
| Without the *takeCHARGE* rebate what is the quantity of the measure that would have been purchased | # of respondents | | | 71 | | 67 | | 86 |
| | Same number/size | 100% | 77% | 55 | 62% | 42 | 55% | 47 |
| | Fewer/smaller size | 50% | 7% | 2 | 26% | 9 | 25% | 11 |
| | More/larger size | 100% | 4% | 3 | 3% | 2 | 4% | 3 |
| | None | 0% | 11% | 0 | 7% | 0 | 16% | 0 |

The number of free riders for each question response was calculated using the following formula and then summed across responses to derive the total number of free riders:

> *Number of Free Riders = (Free Ridership Weight) x (% of Participants for each Response x Total Number of Program Participants)*

DNV GL created free ridership estimates for each program that captured the likelihood of participation along with the effect of the timing of the installation and the quantity of the measure installed. The free ridership data for each question was weighted using the following:

- Likelihood of participation – 50%
- Timing of the installation – 25%
- Quantity of measures installed – 25%

Table 6-17 shows the free ridership estimates. Since free ridership affects the likelihood of installing a measure, the timing of the measure and the quantity installed, we recommend using a weighted free ridership value for the programs.

**Table 6-17: Free Ridership Estimates**

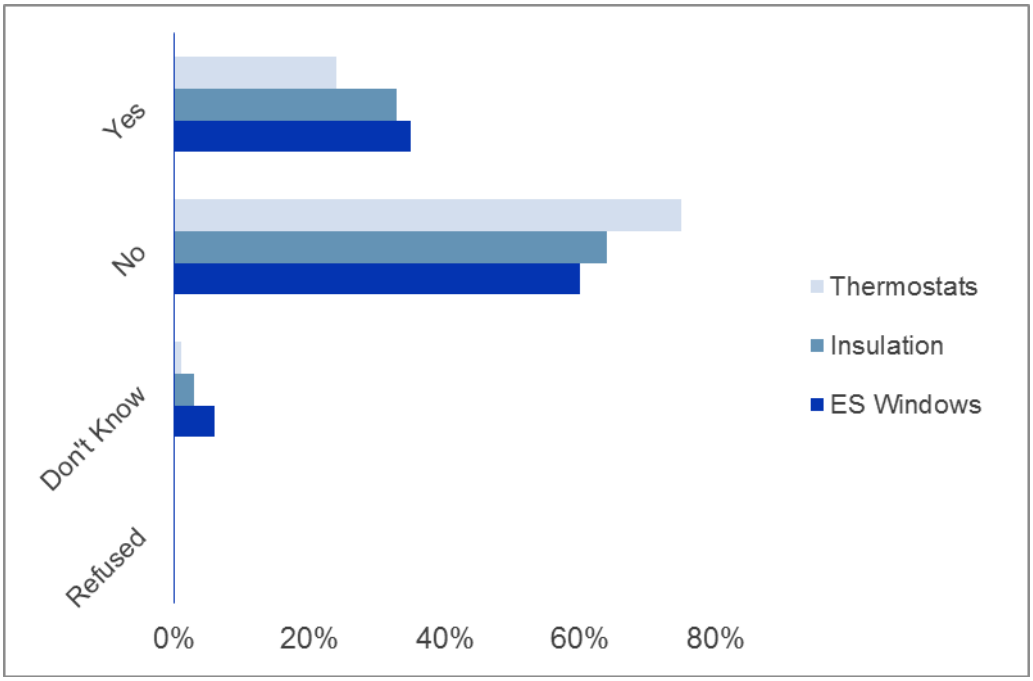
| Free-ridership Estimates | ENERGY STAR Windows | Programmable and Electronic Thermostats | Basement and Attic Insulation |
|---|---|---|---|
| Weighted: 50% likelihood/25% timing/25% quantity | 62% | 48% | 53% |
| Only on Likelihood | 53% | 54% | 64% |
| Only on Timing | 82% | 60% | 59% |
| Only on Quantity | 85% | 78% | 72% |

## 6.2.2 Spill Over

The spill over analysis focused on quantifying the installation of measures offered by the *takeCHARGE* program that occurred outside of the program. Participants were asked a series of questions regarding the type of measures installed and the influence of the program on the purchasing decisions. The responses were weighted to create an estimate of spill over for each program.

Participants were first asked if they had implemented any additional energy efficiency measures in their homes since participating that were not rebated by the program. Thirty-five percent of participants in the ENERGY STAR program, along with 33% in the insulation program and 24% of thermostat program participants, implemented additional measures not rebated by the program. Figure 6-8 shows the responses for each program.

**Figure 6-8: Participants Who Implemented Additional Measures**




****May not sum to total due to rounding.*

There were several statistically significant differences (at 90% level or higher) regarding participants who implemented additional measures outside of the program.

- Spill over was more common among ENERGY STAR window participants with older homes. Forty-six percent of ENERGY STAR windows program participants whose homes were built prior to 1980 implemented additional non-rebated energy efficiency measures in their homes. However, 32% of participants with homes built between 1980 and 2008 and only 9% of newer homes built after 2009 implemented measures.
- Insulation program participants who implemented additional energy efficiency measures are more likely to be motivated to save money than to save energy. As 43% of insulation program participants who were primarily motivated by money implemented additional energy savings on their own. This compares to only 25% of insulation program participants who were primarily motivated by a desire to save energy that implemented measures beyond those rebated by the program.
- Thirty-six percent of Avalon residents and 31% of residents on the Rest of Island reported implementing measures beyond those incentivized by the *takeCHARGE* programs; however none of the Labrador residents implemented additional measures.
- Thermostat program participants over the age of 64 were more likely (52%) than participants under 40 (30%) and those age 40-64 (17%) to have taken additional energy efficiency measures that did not receive an incentive.

The number average number of measures installed by participants outside of the program is shown in Table 6-18.

**Table 6-18: Average Number of Measures Installed Outside of the Program**

| Number of "Spill Over" Measures | ENERGY STAR Windows (n=25) | Insulation (n=22) | Programmable/ Electronic Thermostats (n=71) |
|---|---|---|---|
| Average Number – Per Participant | 6.0 windows | 4.4 units (Either rolls or foam board) | 3.9 thermostats |

** n refers to the number of respondents who responded to the question.*

There were several statistically significant differences (at 90% level or higher) in regard to the number of additional participant actions taken that did not receive rebates under the *takeCHARGE* programs.

- Thermostat program participants who were satisfied with their program experience installed about twice as many thermostats not rebated by the program than unsatisfied participants, 4.1 vs. 2.0 on average.
- Surprisingly, thermostat program participants who were not just motivated to save money implemented about twice as many thermostats (4.7) than those primarily motivated to save money (2.7).

Program participants who engaged in spill over behavior were asked if their participation in the program influenced their decision to take additional energy saving actions. Forty-four percent of insulation program participants, 23% of ENERGY STAR window participants and 18% of thermostat program participants indicated that the takeCHARGE programs did influence their actions. The responses are shown in Table 6-19. Furthermore, the majority of the insulation participants who implemented additional insulation measures, 74%, lived in homes built before 1980.

**Table 6-19: Participant Spill Over Actions Influenced by Program**

| Participant Influenced | ENERGY STAR Windows (n=25) | Insulation (n=22) | Programmable/ Electronic Thermostats (n=21) |
|---|---|---|---|
| Yes | 23% | 44% | 18% |
| No | 73% | 56% | 82% |
| Don't Know | 4% | 0% | 0% |

** n refers to the number of respondents who responded to the question.*
****May not sum to total due to rounding.*

Participants were also asked if they would have installed additional measures if they had not participated in the program. Only 16% in the insulation program would not have acted, along with 13% in the ENERGY STAR windows program and 9% in the thermostat program, refer to Table 6-20. The high level of positive responses correlates the relatively high level of free ridership described in the previous section.

**Table 6-20: Participants Who Planned to Install the Measures if did not Participate in the Program**

| Participant Installing Measures | ENERGY STAR Windows (n=25) | Insulation (n=22) | Programmable/ Electronic Thermostats (n=21) |
|---|---|---|---|
| Yes | 87% | 84% | 91% |
| No | 13% | 16% | 9% |
| Don't Know | 0% | 0% | 0% |

** n refers to the number of respondents who responded to the question.*
****May not sum to total due to rounding.*

Spill over was more prevalent among low income households that participated in the ENERGY STAR windows program as 50% of additional measures would not have been installed without the program. This compares to only 10% of additional measures installed in middle income households ($60-100K) and 0% for higher income households (>$100k).

Participants were asked if they had made any changes in the way they manage energy use in their home since participation. Table 6-21 shows 45% of thermostat program participants, along with 37% of insulation program participants and 36% of ENERGY STAR windows participants have made changes.

**Table 6-21: Participant Changes in Household Energy Management**

| Participants Changing Energy Management | ENERGY STAR Windows (n=25) | Insulation (n=71) | Programmable/ Electronic Thermostats (n=86) |
|---|---|---|---|
| Yes | 36% | 37% | 45% |
| No | 64% | 60% | 55% |
| Don't Know | 0% | 3% | 0% |

** n refers to the number of respondents who responded to the question.*
****May not sum to total due to rounding.*

There were several statistically significant differences (at 90% level or higher) regarding participants who manage their household energy usage.

- For insulation program participants, changes in household energy management appeared to be the most common among people who are between the age of 40 and 64, with 47% indicated changing

energy use behaviour since participating compared to only 23% of participants under the age of 40 and 15% of seniors 65 and older.

- Insulation program participants with children under the age of 17 were less likely (26%) to make changes in way household energy use is managed than those without children (49%).
- Insulation program participants with homes over 2,500 square feet were more likely (63%) to make changes in the way they manage household energy use, compared to 27% of midsized homes (1,000-2,500 ft2) and 0% for homes less than 1,000 square feet.
- Thermostat participants who had a high school education or less had the highest percentage of respondents who made changes to their energy usage compared to respondents with higher levels of education.
- Thermostat program participants living in homes less than 1,000 square feet and built before 1980 were more likely to have seen changes in the occupants' management of energy use after participating.

Participants who did make changes in the way they manage household energy use were asked if the program influenced their decision to make additional changes/improvements, and 60% from the insulation program, 49% from the thermostat program and 38% from the ENERGY STAR window program were.

**Table 6-22: Participant Changes in Household Energy Management Influenced by Program**

| Participant Changes | ENERGY STAR Windows (n=27) | Insulation (n=25) | Programmable/ Electronic Thermostats (n=38) |
|---|---|---|---|
| Yes | 38% | 60% | 49% |
| No | 62% | 36% | 47% |
| Don't Know/Refuse | 0% | 3% | 3% |

** n refers to the number of respondents who responded to the question.*
****May not sum to total due to rounding.*

There were several statistically significant differences (at 90% level or higher) in regard program influenced changes in household energy use.

- Higher income earners in the insulation program were more likely (85%) to be persuaded by the program to take additional energy efficiency measures beyond those rebated by the program than those earning $60-100k (39%) and those earning less than $60k per year (57%).
- Insulation program participants living in new homes were least likely (25%) to have been influenced by their participation to take additional un-rebated action to save energy when compared to those in older homes (63%) and occupants of home built between 1980 and2008 (82%).

### 6.2.2.1 Spill over Estimates

The spill over analysis was comprised of two components:

- Estimating the percentage of participants who installed *takeCHARGE* measures outside of the program
- Estimating the percentage of non-participants who were influenced by the *takeCHARGE* program to install measures but chose not to participate

For participants spill over estimates were based upon two telephone survey questions that asked the influence of the *takeCHARGE* programs on their decisions to implement the additional measures. The questions were developed to ask the same information in two different ways as a means to verify the participant responses. The question responses serve as range of the spill over estimates. Table 6-23

shows the percentage of participants who installed additional measures, the influence of the program on their decisions and the assigned weight used to calculate spill over.

**Table 6-23: Participants Implementing Additional Measures and Spill Over Question Responses**

| Participants | Spill Over Weight | ENERGY STAR Windows | Insulation | Programmable/ Electronic Thermostats |
|---|---|---|---|---|
| Do you have additional measure opportunities? | | 71 | 67 | 86 |
| Yes | | 35% | 33% | 24% |
| No | | 60% | 64% | 75% |
| Did your participation in the program influence your decision to make these additional measures | | 25 | 22 | 21 |
| Yes | 100% | 23% | 44% | 18% |
| No | 0% | 73% | 56% | 82% |
| Spill over Estimate 1 | | 8% | 14% | 4% |
| Do you think you would have purchased and installed these additional measures if you had not participated in the program? | | 25 | 22 | 21 |
| Yes | 0% | 87% | 84% | 91% |
| No | 100% | 13% | 16% | 9% |
| Spill over Estimate 2 | | 5% | 5% | 2% |

The participant spill over estimates were derived using the following calculations:

- ***Participant Spill over Estimate 1*** *= ((Number of Participants Implemented Additional Measures) x (% of Participants Who Responded that Participating in the Program Influenced Their Decision to Implement Additional Measures))/Total Number of Participants*

- ***Participant Spill over Estimate 2*** *= ((Number of Participants Implemented Additional Measures) x (% of Participants Who Responded that if They Would Not Have Implemented Additional Measures if They Had Not Participated in the Program))/Total Number of Participants*

The responses to both questions yielded relatively low spill over for participants further supporting the findings found in the free ridership analysis, that the majority of participants were planning to implement the measures without the programs.

The non-participant spill over analysis focused on their awareness of the program and the effect of the program on their decision to install the measures. Table 6-24 shows a high awareness of the *takeCHARGE* program offerings among non-participants who installed measures which resulted in high non-participant spill over ranging from 40% for thermostats to 50% for ENERGY STAR Windows. Non-participant spill over was estimated for each program based on the following calculation:

- ***Non-participant Spill over Estimate*** *=(% of Non-participants who installed measures that met the program requirements x number of non-participants who were aware of the program))/Total Number of Non-participants*

**Table 6-24: Non-Participant Spill Over**

| Non-Participants | Spill Over Weight | ENERGY STAR Windows | Insulation | Programmable/ Electronic Thermostats |
|---|---|---|---|---|
| Non-participants Who Installed Measures and Aware of Measures Offered in *takeCHARGE* | | 75 | 43 | 76 |
| Yes | | 68% | 57% | 61% |
| No | | 28% | 41% | 33% |
| Based upon awareness, did you purchase measures that met the program requirements? | | 51 | 24 | 47 |
| Yes | 100% | 73% | 87% | 66% |
| No | 0% | 18% | 5% | 34% |
| Spill over Estimate | | 50% | 49% | 40% |

## 6.3 Market Potential Estimates

This section synthesizes the results from the baseline analysis and attribution analysis to develop gross and net market share. Gross market share is defined as the remaining market share for each of the three technologies offered by the *takeCHARGE* program. We developed a range of market share estimates that reflected varying assumptions of adoption patterns among existing participants and non-participants. The net market share estimates were developed by applying the results of the attribution analysis to the gross market shares:

Net Market Share = Gross Market Share - Free Rider Customers + Spill Over Customers

Market share estimates were developed for each *takeCHARGE* program and by geographical region.

### 6.3.1 Gross Market Potential Shares

The first step in the market potential analysis was to estimate the number of eligible customers for *takeCHARGE* programs. This information was obtained from the Utilities for the most recent year available. Table 6-25 shows the total number of eligible customers. This information was used to derive the market potential for the customers who had not participated in the program.

**Table 6-25: Number of Residential Customers Eligible for the *takeCHARGE* Programs**

| Number of Residential Customers Eligible for the *takeCHARGE* Programs | | | | |
|---|---|---|---|---|
| | Total | Avalon | Rest of Island | Labrador |
| # of Customers | 105,917 | 62,570 | 36,141 | 7,206 |

Newfoundland Power has 93,383 eligible customers. It was assumed that approximately 67% of the customers resided in Avalon with the remaining customers located in the Rest of Island region. Hydro has 12,534 customers with 7,206 located in Labrador and 5,376 in the Rest of Island region.

Table 6-26 shows the number of *takeCHARGE* participants

**Table 6-26: Number of Participants in the *takeCHARGE* Programs**

| Number of Participants in the *takeCHARGE* Programs (2009-2012) | | | | |
|---|---|---|---|---|
| | TOTAL | Avalon | Rest of Island | Labrador |
| Basement and Attic Insulation | 5,175 | 3,328 | 1,743 | 104 |
| Programmable and Electronic Thermostats | 6,081 | 3,997 | 2,018 | 66 |
| ENERGY STAR Window | 5,437 | 3,564 | 1,806 | 67 |
| TOTAL | 16,693 | 10,889 | 5,567 | 237 |

Table 6-27 presents the estimate of eligible non-participants by region. It was calculated by taking the total number of eligible customers less the number of participants for each region.

**Table 6-27: Number of Non-participants Eligible for the *takeCHARGE* Programs**

| Number of Residential Non-Participant Customers Eligible for the *takeCHARGE* Programs | | | | |
|---|---|---|---|---|
| | Total | Avalon | Rest of Island | Labrador |
| # of Customers | 89,224 | 51,681 | 30,574 | 6,969 |

The results of the market share analysis are presented below.

### 6.3.1.1 Gross Market Share – Basement and Attic/Crawl Space Insulation

The market share analysis estimated the remaining market share among participants and non-participants. The market share range assumed the following:

- Upper range assumed all participants with additional installation would install the measure
- Lower range assumed that a percentage of the participants, despite the opportunity would be unlikely to install the measure.

Of the nearly 17,000 participants 11% stated that there were additional opportunities for basement insulation, either wall or ceiling However, 62% of respondents indicated they would not install the measure, due to costs, inconvenience etc. This question was asked about all additional measures in general, not basement insulation specifically. The response was used as an indicator in the analysis as a proxy for likelihood to install the measure. Two estimates of gross market share were derived:

1. Maximum participant market share assumes all participants who cite additional opportunities install the measure.
2. Achievable market share assumes excludes the participants who stated they would not install the measure.

Table 6-29 shows the range of gross market share of basement insulation from 837 participants to 2,327 participants. The majority of additional program participants are in the Avalon region.

**Table 6-28: Gross Market Potential for Basement Insulation among All *takeCHARGE* Participants**

| Participants | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Number of 2009-2012 *takeCHARGE* Participants | 16,693 | 10,889 | 5,567 | 237 |
| % of Participant Citing Additional Opportunities for Basement Insulation | 14% | 16% | 10% | 14% |
| Participants Who Reported Some Type of Additional Opportunity But Chose Not to Install | | 62% | 71% | 62% |
| Estimated Number of Participants with Additional Opportunities for a Measure but Chose not to Install | 1,655 | 1,073 | 398 | 20 |
| Max Number of Potential Participants - Basement Insulation | 2,327 | 1,738 | 557 | 33 |
| Potential % less those who Chose Not to Install - Basement Insulation | 837 | 665 | 159 | 13 |

The estimate of remaining participant market potential for attic insulation followed a similar methodology. Additional attic insulation opportunities were slightly lower than for basement insulation; however, Avalon had the largest number of potential repeat participants. Table 6-29 shows the results of the analysis.

**Table 6-29: Gross Market Potential for Attic Insulation Among *takeCHARGE* Participants**

| Participants | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Number of 2009-2012 *takeCHARGE* Participants | 16,693 | 10,889 | 5,567 | 237 |
| % of Participants Citing Additional Opportunities for Basement Insulation | 8% | 8% | 8% | 11% |
| Estimated Number of Participants with Additional Opportunities for Basement Insulation | 1,348 | 872 | 449 | 27 |
| % of Participants Who Reported Some Type of Additional Opportunity But Chose Not to Install | | 62% | 62% | 71% |
| Estimated Number of Participants with Additional Opportunities for a Measure but Chose Not to Install | 836 | 538 | 278 | 19 |
| Maximum Number of Potential Participants for Basement Insulation | 1,348 | 872 | 449 | 27 |
| Maximum Number of Participants less those who Chose Not to Install | 509 | 331 | 171 | 8 |

For non-participants, the analysis the market potential was based upon the number of non-participants who had insulation with R-values that did not meet the minimum requirements of the *takeCHARGE* programs. The number of non-participants who do not meet the minimum requirements set the upper bound for the market potential for this customer segment.

Table 6-30 shows the breakout of non-participants by geography and type of insulation.

**Table 6-30: Number of Non-Participants with Insulation Levels Below *takeCHARGE* Minimum Requirements**

| Insulation Type | Non-participants | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|---|
| | Number of Eligible Non-participants Customers | 89,224 | 51,681 | 30,574 | 6,969 |
| Basement Wall | Percentage of Non-participants with R-values < R-18 | | 17% | 35% | 50% |
| | Estimated Number of Non-participants with R-values < R-18 | 22,971 | 8,786 | 10,701 | 3,485 |
| Basement Ceiling | Percentage of Non-participants with R-values < R-30 | | 46% | 64% | 68% |
| | Estimated Number of Non-participants with R-values < R-30 | 48,080 | 23,773 | 19,567 | 4,739 |
| Attic | Percentage of Non-participants with R-values < R-50 and < R-60 for Labrador | | 60% | 64% | 58% |
| | Estimated Number of Non-participants with R-values < R-50 and <R-60 for Labrador | 54,618 | 31,009 | 19,567 | 4,042 |

Table 6-31 shows the distribution of non-participants that were aware of the *takeCHARGE* rebates and the percentage of those customers who did not install the measures despite the rebates.

**Table 6-31: Non-Participant Awareness of Rebates**

| Non-Participants Awareness | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| % Aware of Insulation Rebates | 57% | 53% | 56% | 63% |
| % Aware of Measures but Did Not Install | 5% | 0% | 10% | 0% |

The market share estimates are provided in Table 6-29. For each program, a range of market potential estimates were developed. The range was based upon the following assumptions:

- Maximum potential – assumes all non-participants who did not meet the program minimum requirements install the measures
- Mid-level potential – assumes only non-participants who were aware of the *takeCHARGE* program will install the measures
- Lower-level potential – assumes that some non-participants despite the awareness and need for the measure will choose not to install the measure.

Rest of Island had the largest market potential among the three regions. Also, in Labrador, all of the non-participants who were aware of the rebates installed basement wall and ceiling insulation outside of the program. It is important to remember that given the relatively small samples sizes for Labrador, the respondents may not be representative of the Labrador's customer population.

**Table 6-32: Non-Participant Gross Market Potential Estimates**

| Insulation Type | Non-participants - Market Potential | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|---|
| Basement Wall | Max potential Non-participants | 22,971 | 8,786 | 10,701 | 3,485 |
| | All aware install | 13,052 | 4,651 | 5,945 | 2,178 |
| | Aware - % choose not to install | 12,356 | 4,651 | 5,350 | 2,178 |
| Basement Ceiling | Max potential Non-participants | 48,080 | 23,773 | 19,567 | 4,739 |
| | All aware install | 27,319 | 12,586 | 10,871 | 2,962 |
| | Aware - % choose not to install | 25,861 | 12,586 | 9,784 | 2,962 |
| Attic/Crawl Space | Max potential Non-participants | 54,618 | 31,009 | 19,567 | 4,042 |
| | All aware install | 31,035 | 16,416 | 10,871 | 2,526 |
| | Aware - % choose not to install | 29,378 | 16,416 | 9,784 | 2,526 |

### 6.3.1.2 Gross Market Share – ENERGY STAR Windows

The market potential estimates for ENERGY STAR windows followed the same methodology as described for basement and attic insulation in the previous section. Table 6-33 shows the results for the participant population. Overall 27% of customers stated there were additional opportunities to install ENERGY STAR windows in their home. However, in Labrador's region the penetration of ENERGY STAR windows was extremely high among participants yielding very little remaining market potential for these customers.

**Table 6-33: Market Potential for ENERGY STAR Windows Among Participants**

| Participants | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Number of 2009-2012 takeCHARGE Participants | 16,693 | 10,889 | 5,567 | 237 |
| % of Participants Citing Additional Opportunities for ENERGY STAR Windows | 28% | 32% | 22% | 14% |
| Number of Participants Citing Additional Opportunities for ENERGY STAR Windows | 4,734 | 3,475 | 1,225 | 34 |
| % of Participants Who Reported Some Type of Additional Opportunity But Chose Not to Install | 62% | 38% | 21% | 3% |
| Participants Who Reported Some Type of Additional Opportunity But Chose Not to Install | 1,588 | 1,335 | 252 | 1 |
| Max Number of Potential Participants | 4,734 | 3,475 | 1,225 | 34 |
| Potential less % Chose Not to Install | 3,146 | 2,140 | 973 | 33 |

Table 6-34 presents the results for the non-participants, as was the case with insulation, the Rest of Island had the highest market potential for ENERGY STAR windows among non-participants.

**Table 6-34: Gross Market Share Non-Participants for ENERGY STAR Windows**

| Non-participants | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Number of Eligible Non-participants Customers | 89,224 | 51,681 | 30,574 | 6,969 |
| % of Non-participants with Single Pane Windows | 27% | 28% | 30% | 14% |
| Number of Non-participant with Single Pane Windows | 24,619 | 14,471 | 9,172 | 976 |
| Aware of ENERGY STAR Windows | 68% | 68% | 75% | 54% |
| Aware of ENERGY STAR Windows but Did Not Install | 9% | 6% | 10% | 27% |
| **Market Potential** | | | | |
| Max Potential - All Non-participants With Potential Opportunities Install (# Customers) | 24,619 | 14,471 | 9,172 | 976 |
| All Aware Non-participants Install (# Customers) | 17,193 | 9,789 | 6,879 | 525 |
| All Aware Non-participants Install Less % of Non-participants Who Did Not Install (# Customers) | 15,768 | 9,219 | 6,163 | 368 |

### 6.3.1.3 Gross Market Share – Programmable and Electronic Thermostats

The gross market potential for programmable and electronic thermostats among participants and non-participants followed the same methodology as the basis for the insulation and ENERGY STAR window market estimates. Table 6-35 shows the results for the participant population. It is important to point out that none of the Labrador participants reported any additional opportunities for programmable or electronic thermostats. Also, the question asking the percentage of those respondents who would not install the measure, due to costs, inconvenience etc. was asked about all additional measures in general, not thermostats specifically.

**Table 6-35: Market Potential for Programmable and Electronic Thermostats Among Participants**

| Participants | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Number of 2009-2012 *takeCHARGE* Participants | 16,693 | 10,889 | 5,567 | 237 |
| % of Participants Citing Additional Opportunities for Thermostats | 27% | 26% | 32% | 0% |
| Number of Participants Citing Additional Opportunities for Thermostats | 4,562 | 2,780 | 1,781 | - |
| % of Participants Who Reported Some Type of Additional Opportunity But Chose Not to Install | 62% | 38% | 21% | 3% |
| Number of Participants Citing Additional Opportunities for Thermostats but Chose Not to Install | 1,434 | 1,068 | 365 | - |
| Maximum Potential if All Non-participants With Potential Install (# Customers) | 4,562 | 2,780 | 1,781 | - |
| All Non-participants With Potential Install Less Customers Who Chose Not to Install | 3,128 | 1,712 | 1,416 | - |

The market potential for programmable and electronic thermostats among non-participants is shown in Table 6-36.

**Table 6-36: Market Potential for Electronic and Programmable Thermostats Among Non-participants**

| Non-participants with Manual Thermostats | Total | Avalon | Rest of Island | Labrador |
|---|---|---|---|---|
| Standard Thermostats - average per home | 7 | 8.4 | 6.2 | 6.9 |
| Number of Eligible Non-participants Customers | 89,224 | 51,681 | 30,574 | 6,969 |
| % of Non-participants Citing Opportunities for Programmable/Electronic Thermostats | 48% | 53% | 48% | 17% |
| Number of Non-participants Citing Opportunities for Programmable/Electronic Thermostats | 43,251 | 27,391 | 14,676 | 1,185 |
| % of Non-participants Aware of Programmable/Electronic Thermostats | 61% | 56% | 59% | 83% |
| Number of Eligible Non-participants Customers Who Are Aware of Programmable/Electronic Thermostats | 24,981 | 15,339 | 8,659 | 983 |
| % of Non-participants Aware of Programmable/Electronic Thermostats but Did Not Install | 21% | 16% | 30% | 17% |
| Number of Non-participants Aware of Programmable/Electronic Thermostats but Did Not Install | 5,219 | 2,454 | 2,598 | 167 |
| **Market Potential** | | | | |
| Max Potential - All Non-participants With Potential Opportunities Install (# Customers) | 43,251 | 27,391 | 14,676 | 1,185 |
| All Aware Non-participants Install (# Customers) | 24,981 | 15,339 | 8,659 | 983 |
| All Aware Non-participants Install Less % of Non-participants Who Did Not Install (# Customers) | 18,946 | 12,885 | 6,061 | 816 |

## 6.3.2 Net Market Potential

### 6.3.2.1 Net Market Potential – *takeCHARGE* Insulation Program

The net market potential was calculated by applying the free ridership and spill over values at the program level. It is important to recognize that customers can chose to participate in multiple programs. The program net potential numbers refer to total number of potential participants. This is particularly important regarding the *takeCHARGE* Insulation program. For example, if a customer participates and installs attic insulation and basement wall insulation, they are count as two participants with savings associated with the individual measures in the program.

Table 6-37 shows the net market potential for the *takeCHARGE* Insulation Program. It was based upon the following assumptions:

- Two program level market potential sums were created:
  - Maximum market potential assumed all participants and non-participants with additional measure opportunities install the measure. This value serves as the upper bound.
  - Market potential based upon the proportion of participants and non-participants who were aware of the program less the number of participants and non-participants who were not likely to install the measure.
- The free ridership value used in the analysis was the free ridership value based upon the responses to the likelihood of installing the measure, the influence of the rebate on the timing of the installation and the effect of the rebate on the quantity of the measure installed.

- The spill over for participants valued applied in the analysis was an average of the responses to the two spill over questions regarding the influence of the presence of the program on the purchasing decisions of the participants.

Table 6-37 shows the results of the net market potential. The high level of spill over attributable to non-participants helped to narrow the gap between the gross and net market potential estimates. However, this market analysis focused on four years of program experience, a length of time that can be sufficient to move the baseline practices of customers toward the energy efficient alternatives. This relationship will be discussed in greater detail in Section 6.3 regarding the exit strategies for the *takeCHARGE* programs.

**Table 6-37: Net Market Potential – *takeCHARGE* Insulation Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential | 129,344 | 66,177 | 50,841 | 12,326 | 3,675 | 2,609 | 1,006 | 60 | 125,669 | 63,568 | 49,836 | 12,265 |
| Potential % less those who Chose Not to Install - Total | 68,941 | 34,650 | 25,247 | 7,686 | 1,346 | 996 | 330 | 20 | 67,595 | 33,653 | 24,918 | 7,666 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential | 122,642 | 62,466 | 48,377 | 11,799 | 2,103 | 1,493 | 576 | 34 | 120,539 | 60,973 | 47,801 | 11,765 |
| Potential % less those who Chose Not to Install - Total | 65,606 | 32,850 | 24,089 | 7,365 | 770 | 570 | 189 | 12 | 64,836 | 32,280 | 23,901 | 7,353 |

### 6.3.2.2 Net Market Potential – *takeCHARGE* ENERGY STAR Window Program

The methodology used to derive the net market potential for the *takeCHARGE* insulation program was applied to the ENERGY STAR window program. Similar to the insulation program, the significant spill over in the non-participant sector narrows the difference between gross and net for ENERGY STAR windows. Furthermore, the penetration of ENERGY STAR windows in Labrador among respondents was high and indicated very little remaining market potential. However, the sample sizes for this study were small and the results may not be indicative of the customer population. Table 6-38 shows the net market potential results.

**Table 6-38: Net Market Potential – *takeCHARGE* ENERGY STAR Windows Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Avalon | Rest of Island | Labrador | Total | Avalon | Rest of Island | Labrador | Total | Avalon | Rest of Island | Labrador |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential Participants | 29,352 | 17,946 | 10,397 | 1,010 | 4,734 | 3,475 | 1,225 | 34 | 24,619 | 14,471 | 9,172 | 976 |
| Potential less % Chose Not to Install | 18,914 | 11,360 | 7,136 | 419 | 3,146 | 2,140 | 973 | 33 | 15,768 | 9,219 | 6,163 | 386 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential Participants | 23,785 | 14,291 | 8,620 | 874 | 2,120 | 1,556 | 548 | 15 | 21,665 | 12,735 | 8,072 | 859 |
| Potential less % Chose Not to Install | 15,285 | 9,072 | 5,859 | 354 | 1,409 | 958 | 436 | 15 | 13,876 | 8,113 | 5,423 | 340 |

### 6.3.2.3 Net Market Potential – *takeCHARGE* Programmable/Electronic Program

Table 6-39 presents the net market potential in each of the region for the *takeCHARGE* Programmable and Electronic Thermostat Program. As discussed in the gross analysis, there is no remaining potential for thermostats in the Labrador region based upon the responses in this survey. However, we reiterate that the findings from this size of survey sample may not be indicative of the population of eligible customers in Labrador. Again, high awareness of the program and its influence on purchasing patterns among non-participants yielded high spill over rates which drove up overall market potential.

**Table 6-39: Net Market Potential – *takeCHARGE* Programmable/Electronic Thermostats**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential Participants | 47,813 | 30,171 | 16,457 | 1,185 | 4,562 | 2,780 | 1,781 | - | 43,251 | 27,391 | 14,676 | 1,185 |
| Potential less % Chose Not to Install | 22,074 | 14,597 | 7,477 | 816 | 3,128 | 1,712 | 1,416 | - | 18,946 | 12,885 | 6,061 | 816 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential Participants | 42,611 | 26,925 | 14,589 | 1,097 | 2,545 | 1,551 | 994 | - | 40,065 | 25,373 | 13,595 | 1,097 |
| Potential less % Chose Not to Install | 19,295 | 12,891 | 6,404 | 756 | 1,745 | 955 | 790 | - | 17,550 | 11,936 | 5,615 | 756 |

## 6.4 Recommendations for Potential Exit Strategies

When considering any program design changes many factors must be considered, including:

- Relationships with customers
- Relationship with vendors: contractors and retailers
- Cost effectiveness of current programs relative to re-designed and/or new programs
- Ensuring the energy efficiency strategy meets the internal and external corporate needs and goals

All of these are necessary, but not always equal in importance, to produce a 'successful' suite of energy efficiency programs.

This study has identified several key findings that can be used to help shape and build upon the Utilities' current suite of energy efficiency offerings. The evaluation period for this study was from 2009 through 2012, encompassing the program start-up phase through full scale implementation. Consequently, both program participants and non-participants have had a lengthy period of time to be exposed to the program. This was reflected in the high level of free ridership among customers and spill over among non-participants. Sufficient time has elapsed that has the exhaustion of market opportunities in some regions, such for thermostats and ENERGY STAR windows in Labrador, albeit the smallest of the three regions.

Furthermore, over the course of the past four years retailers and contractors have also changed their behaviour. Retailers have witnessed an increase in the demand for the *takeCHARGE* measures. They do not expect this trend to reverse and expect continued growth in the do-it-yourself market. Contractors have had time to incorporate many of the *takeCHARGE* minimum requirements into their standard offerings. While the contractors were entirely focused on the new construction market which is no longer eligible for the current *takeCHARGE* programs they were optimistic that the new construction sector will continue to thrive. The continued growth in the new construction market could lend itself to opportunities for new energy efficiency measures.

The results of this study indicate that the current *takeCHARGE* programs have affected customers' and vendors' purchasing practices and creating a more efficient baseline market. The Utilities are now at a point when they are considering expanding their energy efficiency and examining their current offerings. Several high level performance metrics of the programs can help signal consideration for exiting or modifying the current *takeCHARGE* programs, specifically:

- Market penetration rates: Industry experience has shown that when program measures reach market penetration rates of 30% to 40% that the program has impacted the efficiency of the baseline market and can be either phased out or modified to reach even higher efficiency levels or offer additional measure. Furthermore, the momentum of a program with its effect on retailer stocking patterns, contractor practices and customer behaviour can continue after the original program or offerings end.
- Free ridership and spill over: Free ridership values for rebate programs in excess of 40% often signal that the marketplace does not require rebates to achieve the desired savings. Similar values for spill over indicate that customers are willingly adopting the measures without needed rebate incentives.

In light of the findings in this study, the Utilities should continue to monitor and explore future offerings to residential homeowners and continue to capitalize on their relationships with builders, contractors and retailers.

# 7 IMPACT METHODOLOGY BEST PRACTICES

This section provides an overview of the best practices used for impact evaluations. It also includes a recommendation of the methodology for the *takeCHARGE* impact evaluation.

## 7.1 Gross Savings Methodologies

Over time, the evaluations of energy efficiency programs have yielded a set of best practices for conducting impact evaluations. The roster of available methods to estimate gross annual energy savings from energy efficiency programs is well established and their relative strengths, limitations, and best applications are well understood. Table 7-1 briefly summarizes this information. Part of the EM&V Planning process in an evaluation study includes identifying the most appropriate gross savings analysis method, based on the nature of the measures installed, the priority accorded the program by a utility and its stakeholders, and the quality and availability of program tracking system and billing data.

**Table 7-1: Strengths, Limitations, and Best Applications of Alternative Methods to Estimate Annual Gross Savings**

| Method | Strengths | Limitations | Best Applications |
|---|---|---|---|
| **Engineering Estimates: No Verification** | • Very low cost<br>• Quick deployment, timely results<br>• Transparent – assuming well-documented deemed savings<br>• Format consistent with planning assumptions & estimates | • Poor accuracy for measures where savings are closely related to site-specific conditions<br>• Implicit assumptions concerning installation rates, replacement/retrofit, and other customer-specific actions | • Programs that account for low percentage of total portfolio gross savings<br>• Programs that support relatively uniform measures, e.g.: CFLs, appliances |
| **Engineering Estimates: Phone Verification Only** | • Low cost<br>• Quick deployment, timely results<br>• Transparent<br>• Consistent with planning methods<br>• Supports adjustment of savings for some site and customer attributes<br>• Can provide some valuable information for deemed savings estimates | • Relies on customer reports on variables on which they may have little or inaccurate recall: e.g. quantity installed, space heat type, hours of operation, size of space affected<br>• Relies on assumptions for factors that customers cannot observe or report, e. g. part loads, equipment capacities | • Programs that do not account for very large percentages of total portfolio gross savings<br>• Programs that support relatively uniform measures, e.g.: CFLs, appliances, some kinds of commercial lighting & HVAC. |
| **Verification & Simulation Modeling** | • Captures and explicates savings from projects with multiple, interacting components<br>• Develops project specific baselines for new construction and major renovation<br>• Can be used with data on population characteristics to project savings | • High cost<br>• Operation of some simulation models difficult to explain<br>• Results often highly sensitive to small changes in modeling assumptions<br>• Exacting and inflexible data requirements | • Evaluations of new construction programs<br>• Evaluation of programs that support large custom measures in C&I facilities) |

| Method | Strengths | Limitations | Best Applications |
|---|---|---|---|
| **Billing Analysis** | • Relatively inexpensive compared to M&V<br>• Provides direct measurement of changes in energy use – intuitively credible for many audiences | • Not timely due to need for post-installation data from large sample<br>• Requires cooperation of many parties to obtain data<br>• Significant implementation risk to isolate the impact of specific program measures and/or activities | • Retrofit programs with relatively uniform measures, large participation, significant impact on baseline consumption in participant facilities<br>• Residential new construction programs<br>• Demand response programs (modeling of customer baselines – required whole-premise meters with 5 – 15 minute recording capability |

## 7.2 Net-to-Gross Methodologies

Many methodological approaches can be found in the energy efficiency program evaluation literature for assessing attribution of savings to specific programs and quantifying net savings. These include:

- **Analysis of self-reports of program effects by targeted market actors (Self-reports).** This approach typically involves surveying samples of actual and/or potential program participants to elicit their assessment of the program's influence on their decisions to adopt energy efficiency measures or practices. The questions can be structured to probe the effect of the program on the timing, extent, and features of the projects in question, as well as the relative importance of the program versus other decision factors. The responses can then be processed to develop an attribution score using a transparent algorithm.
- **Quasi-experimental designs.** This approach uses well-established quasi-experimental social research designs to assess and quantify program attribution. Common strategies include cross sectional methods that compare the rate of measure adoption in an area or market segment not targeted by the program as a baseline for comparison to rates of adoption in the program area. The difference between the two can be viewed as the program's net effect. Pre-post designs that compare the rate of adoption before and after the program or policy intervention have also been applied, as have mixed pre-post/cross-sectional approaches. Statistical modeling is often used to apply retrospectively quasi-experimental approaches to datasets that describe the response of a group of market actors to a given program. For example analysis of variance and regression approaches implicitly invoke quasi-experimental designs by estimating program effects while controlling statistically for the effects of other participant attributes such as income, education, facility size, and so forth. Billing analysis to estimate energy savings from program participation is essentially a quasi-experimental approach. In some cases changes in billed consumption over time are compared for participant and non-participant groups. In other cases pooled time series/cross-sectional regression analysis is used to estimate the fixed effects of program participation.
- **Experimental designs.** Experimental design – by which we understand random assignment of eligible market actors to receive different program treatment -- provides one of the strongest approaches to assessing attribution. Random assignment directly addresses one of the most serious threats to validity that is inherent in other methods for attributing attribution, namely participant self-selection. Self-selection for participation in voluntary programs generally introduces bias to quasi-experimental analyses because participants often differ systematically from non-participants in factors that affect energy savings that cannot be directly observed and controlled for statistically. Experimental designs have been used recently to evaluate the effect of customer education and

information programs. This is a good application of experimental methods because individual participants can be randomly assigned to receive different messages and information products and the marginal cost of program delivery is very low. While evaluation team will look for opportunities to deploy random assignment strategies, we do not anticipate that they will have much application to this evaluation. Generally speaking, it is necessary to design the delivery of programs to support random assignment. This has been accomplished for demand response programs and for programs such as O Power where it is relatively easy to control the services that customers receive on line.

- **Price elasticity approaches, including conjoint analysis and revealed preference analysis.** In these two approaches, researchers assess the effect on changes in price on customer's likelihood of purchasing an energy-efficient product or service. The results of these assessments can then be combined with information on the actual effect of the program on the price participants paid for the product or service in question to estimate the effect of a program-related purchase incentive on the pace of sales. In the case of conjoint analysis, customers are asked to rank a structured set of hypothetical products that vary along a number of dimensions, including performance and price. In the revealed preference approach, purchasers are intercepted at the point of sale to gather information on product selection they actually made, its price, and other features.
- **Structured equation modeling.** Structured equation modeling applies a flexible form of path analysis to identify the most likely causal chain from program outputs such as messaging or incentives on the one hand to taking action to adopt an energy-efficient product of practice on the other. Generally, this type of modeling makes use of psychological theories of motivation and action to identify intermediate steps between program stimuli and the desired action. Calibration and testing of these models generally requires survey data from very large samples of market actors. To date, it has been used primarily to assess the effects of information programs.
- **Adoption process models.** One large class of diffusion theories and research rests on contagion models, where the mechanism of adoption is driven by social contact between individuals or firms that have already adopted the technology and those who have not. The most common formulation of the contagion approach is the "mixed influence" model, of which the well-known Bass curve is an example. These models take into account external influences on model adoption, such as prices of alternative products, as well as the pace and density of interactions among those who have adopted the product and those who haven't.

  The most well-known work in this field, Everett Rogers's *Diffusion of Innovations.* Rogers posits a five-stage sequence that individuals go through the adoption process: knowledge (awareness), persuasion, decision, implementation, confirmation (evaluation). These stages can be used to structure research on the effects of programs over time. For example, Reed et al. assessed the effects of a program by the Federal Energy Management Program (FEMP) to encourage federal agencies to make use of Energy Service Performance Contracting (ESPC) procedures to implement major energy efficiency improvements in their facilities. To do so, they used periodic surveys of agency employees in position to use ESPC in terms of their adoption stage. Changes in the distribution of the population of targeted employees among the adoption stages were used as indicators of program effects. [10]

- **Structured expert judging.** Structured expert judgment studies assemble panels of individuals with close working knowledge of the various causes for changes in the market, technology, infrastructure systems, markets, and political environments addressed by a given energy efficiency programs to estimate baseline market share and, in some cases, forecast market share with and without the program in place. Structured expert judgment processes employ a variety of specific

[10] Reed, John H., Gretchen Jordan, and Edward Vine. *Impact Evaluation Framework for Technology Deployment Programs. Washington D. C.:* U. S. Department of Energy, 2007.

techniques to ensure that the participating experts specify and take into account key assumptions about the specific mechanisms by which the programs achieve their effects. The Delphi process is the most widely known of this family of methods.

- **Historical Tracing: Case Study Method.** This method involves the careful reconstruction of events leading to the outcome of interest, for example, the launch of a product, the passage of legislation, or the completion of a large renewable energy project, to develop a 'weight of evidence' conclusion regarding the specific influence or role of the program in question on the outcome.

  Researchers use information from a wide range of sources to inform historical tracing analyses. These include public and private documents, personal interviews, and surveys conducted either for the study at hand or for other applications.

  Historical tracing relies on logical devices that have been well established historical studies, evaluation of other types of social programs, and legal argument. These include:

  - Compiling, comparing, and weighing the merits of narratives of the same set of events provided by individuals with different points of view and interests in the outcome.
  - Compiling detailed chronological narratives of the events in question to validate hypotheses regarding patterns of influence. This approach corresponds to quasi-experimental methods that make use of pre/post designs.
  - Positing a number of alternative causal hypotheses and examining their consistency with the narrative fact pattern. This step needs to be taken in every qualitative analysis.
  - Assessing the consistency of the observed fact pattern with linkages predicted by a logic model. This approach is particularly important when cross-sectional and pre/post comparisons are not feasible due to the nature of the program or the content of program records.

Table 7-2 summarizes the applicability of these attribution assessment techniques to the various types of energy efficiency programs.

**Table 7-2: Applications of Attribution Assessment Methods by Type of Programs**

⊙ = High Applicability
○ = Secondary Applicability
--- = Little Applicability

| Program Type | ANALYSIS APPROACH | | | | | | |
|---|---|---|---|---|---|---|---|
| | Participant Self-reports | Quasi-Experiments | Experimental Designs | Price Elasticity | Adop-tion Process | Expert Judging | Case Studies |
| **Equipment replacement incentive programs** | ⊙ | ⊙ | --- | ○ | ○ | --- | ○ |
| **Equipment and building retrofit incentive programs** | ⊙ | ⊙ | --- | ○ | ○ | --- | ⊙ |
| **Renewable Energy Incentive Programs** | ⊙ | --- | --- | --- | --- | ⊙ | ⊙ |
| **Information and Training Programs** | ⊙ | ○ | ○ | --- | --- | ○ | ○ |
| **Codes & Standards** | --- | --- | --- | --- | --- | ⊙ | ⊙ |

## 7.3 Recommended Impact Methodology for the *takeCHARGE* Programs

The *takeCHARGE* programs are ideal candidates for a billing analysis approach to estimating program impacts. Variation in baseline household consumption combined with a potentially high level of variation in participation levels at each household, could make this it difficult to develop program savings using a an engineering-based savings methodology. Billing analysis will capture the pre- program consumption of households and measure an average change in consumption after participating in the program. Furthermore, it will capture the interactive effects between measures for participants who installed multiple types of measures. The merits of the billing analysis relevant to the *takeCHARGE* programs are discussed below.

Billing analysis is often used by evaluators to measure the impact of residential gas and/or electric efficiency programs. In the performance of such an analysis, customer billing records are used to measure changes in consumption attributable to program actions. This approach is sometimes referred to as retrospective in nature because customers are generally evaluated a year after participation.

Direct examination of the utility bills of only those customers that had undertaken efficiency measures would not reflect other factors which may have had an effect on the size of the bills. To provide an accurate estimate of savings, it is often necessary to control for the effects of external, non-program

variables. These variables can include weather effects, general economic trends, energy price effects, and specific factors that vary from customer to customer, e.g., occupancy and behavioral changes.

A billing analysis can be performed in one of two different ways both of which address these issues. We choose which billing analysis approach to use depending on the kind of program that is being evaluated.

- Site-level modeling fits a separate, simple regression to the pre- and post- installation data for each household. The difference in the weather normalized pre- and post-installation period consumption for each household is then combined in a second regression to capture the average impacts as a function of measures installed, household characteristics, etc.
- The pooled billing analysis follows a similar basic structure as the site-level approach but includes both pre- and post-installation periods for all participants in a single fixed effect regression model. The model controls for important site-level characteristics while directly estimating average pre-post changes across the included population.

Both approaches control for weather effects by including weather variables directly in the modeling process. With respect to the other variables the two approaches are quite different.

The site-level approach uses a comparison group to control for more general non-weather effects like economic trends and energy price effects. The challenge is identifying an appropriate comparison group that provides the required baseline consumption without causing bias in the estimates by using a comparison group that is not representative of the participant group. This approach is particularly good when a good comparison group is available, like a list of future participants in the same program

With the pooled billing analysis approach, participants effectively provide their own comparison group. Because households participate at different times through a program year, a majority of households are not participating in any particular month. The pooled approach takes advantage of this to control for non-weather effects within the model. This avoids the challenges of developing a separate comparison group.

Other strengths of the site-level approach arise out of the maximum flexibility to fit a model to each site's unique consumption. In theory, this approach can detect any kind of change in consumption that takes place in the post period including changing heating, cooling and base load consumption as well as the set points at which heating and cooling begin. On the other hand, the pooled approach maintains much of the flexibility of the site-level model and better leverages all of the data points to generate results with better precision.

For the billing analyses for the *takeCHARGE* programs, we recommend using a pooled time series cross-sectional model with the following form to estimate savings from installations of energy-efficient central air conditioners:

$$Y_{jt} = \mu_j + \varphi_t + \gamma_H HDD(\tau_H)_{jt} + \gamma_C CDD(\tau_C)_{jt} + \beta E_{jt} + \varepsilon_{jt},$$

where

$Y_{jt}$ = therm per day for participant $j$ during billing period $t$;

$\mu_j$ = participant $j$ constant or fixed effect (=1 if participant $j$ and =0 otherwise);

$\varphi_t$ = billing period $t$ constant or fixed effect (=1 if billing period $t$ and =0 otherwise);

$\tau_H$ , $\tau_C$ = the optimal heating a cooling degree day bases

$\gamma_H$ , $\gamma_C$ , $\beta$ = coefficients estimated by the regression;

$HDD(\tau_H)_{jt}$ = heating degree-days per day for the days included in billing period *t* for participant *j* and the weather station assigned to participant *j*;[1]

$CDD(\tau_C)_{jt}$ = cooling degree-days per day for the days included in billing period *t* for participant *j* and the weather station assigned to participant *j*;

$E_{jt}$ = either 0 or tracking savings per day for the participant *j*, depending on whether billing period *t* occurs before or after the time of program participation. A more general model uses an indicator variable rather than the tracking savings; and

$\varepsilon_{jt}$ = random error for participant *j* during billing period *t.*

In this model, the fixed effect term $\mu_j$ controls for characteristics that are specific to participant j across all billing periods. The fixed effect term $\varphi_t$ controls for conditions affecting billing period t across all participants. Tracking savings per day $E_{jt}$ is calculated simply by dividing tracking annual savings by the number of days in a year. If tracking savings is not available an indicator variable can be used. DNV GL will use a black-out period between the participation and nonparticipation periods to ensure that the characterization of participation status is correct for each observation included in the model.

In this model formulation the coefficient $\beta$ can be interpreted as the gross savings realization rate. Thus, multiplying $\beta$ by the total tracking system savings estimate will yield an estimate of pre-post consumption change due to the program.

This basic billing analysis model can control for additional important characteristics if such data is available for all household included in the billing model. Data from the program application will be useful in this respect if it is deemed complete and reliable. The inclusion of application characteristic data should improve the accuracy of the model.

[1] The base temperature for calculating heating degree days will be determined by examining the performance of the model in estimating actual usage with different base temperatures.

# 8 CONCLUSIONS AND RECOMMENDATIONS

This section summarizes the key findings and recommendations for the *takeCHARGE* programs. First section presents the findings from each of the key research components and tasks. Section 7.2 presents the overall recommendations for the *takeCHARGE* programs.

## 8.1 Summary of Findings

### 8.1.1 Process Evaluation Findings

Overall, three of the *takeCHARGE* programs were operating smoothly from the perspective of the program staff and retailer and vendors. Interviews with staff and vendors identified several key success factors for the program:

- The suite of *takeCHARGE* programs was cost effective and either met or exceeded all of its participation and savings goals in 2012.
- Many participants were repeat participants either within the same program or across programs.
- The turnaround time in processing rebates was short. This was corroborated by participants indicating a high level of satisfaction in the timeliness of their rebates, with 83% to 88% of participants either satisfied or very satisfied.
- Program staff recognized the critical role that retailers have in the programs. The used multiple recruiting and support mechanisms to solicit their involvement in the programs including, in store demonstrations, partnering on rebates, etc.
- Retailers and program staff both indicated that spiffs on products, particularly ENERGY STAR windows were very successful.

Both vendors and program staff identified several challenges and barrier to be addressed:

- The paper rebate form was cumbersome and confusing. The program staff is in the process of offering a streamlined on-line version of the rebate form to customers. Program staff also actively encourages retailers to help customers to complete the form. However, some retailers found it difficult to fill out for customers.
- Some retailers stated that they were still confused about what the qualifications requirements for the measures and suggested more one-on-one interaction with program staff.
- The marketing and outreach efforts were broad and did not target specific geographies or customer types. Tailoring materials to specific customer segments such as rural or Labrador customers would further improve program penetration.

### 8.1.1 Customer Survey Findings

Overall, participating customers had very positive responses to nearly all aspects of the program. Awareness of the *takeCHARGE* programs and the offerings was high among non-participants. The key findings included:

- The demographic differences between participants and non-participants were not significant. However, non-participants typically had smaller single family homes, less than 1,000 square feet compared to participants.
- Nearly 50% of participants cited saving energy as the primary motivation for participating. When asked about participating because the measure failed, 59% of window participants indicated that a reason for participating.
- Non-participants provided a wide range of reasons for not participating, such as personal preference, equipment did not qualify, etc., with no one response accounting for the majority.

- Knowing the amount of the insulation rebate before participating was an important program design feature to both participants (73%) and non-participants (63%).
- Overall, participants were very satisfied across all programs, ranging from 76% to 93%.
- Participants were generally happy with the rebate amounts; however 10% of insulation participants were either dissatisfied or very dissatisfied with their rebates.
- Participants were very satisfied with their retailers, 55% to 64% but stated they had a minimal influence on the type of equipment selected by the participant particularly for thermostats.

## 8.1.2 Program Partners

### 8.1.2.1 Contractors

The contractors interviewed for this study worked predominately in the new construction market. Given the construction boom in Newfoundland and Labrador, this was not surprising. Since having to comply with the new building code, the contractors stated that measures offered by the *takeCHARGE* programs were already incorporated into their standard design offerings. The contractors did provide some feedback and recommendations regarding the program marketing:

- Participating contractors particularly appreciate the opportunity of having a contact person at the utility to answer all their inquiries and support them with the programs' application.
- Add stickers to identify the program (similar to ENERGY STAR stickers for windows)
- Advertise in movie theatres citing the province's high movie attendance
- Include program materials when building approvals are issued

Perhaps the key finding from the contractor interviews was their perception and use of the program rebates. Overall, contractors in general have not expressed any particular need in promoting the programs' measures to their clients. Most contractors promoted the use of energy efficient features in their work without mentioning the *takeCHARGE* programs to their clients (unless the customer asks). Contractors often used energy efficiency as a selling point but did not mention the program to their customers to avoid customers ask for a lower selling price on the house or for concerns that the customer may apply for the rebates directly. Furthermore, the contractors and builders who included energy efficiency as part of their standard offerings viewed the *takeCHARGE* programs as an easy way to recover some of their investments in energy efficiency features that they would have made without the program. While the *takeCHARGE* programs are no longer offered to new construction customers due to the new building codes, contractors who include the energy efficiency options as their standard offerings for retrofit and remodelling projects are free riders.

Both participating and non-participating contractors expect the adoption of energy efficiency measures to continue in the future. Contractors identified a number of energy efficient products that will gain markets share in the coming years:

- Future home automation - smart thermostats
- On-demand hot water systems.

### 8.1.2.2 Retailers

In general, retailers were very satisfied, 90%, with the *takeCHARGE* programs but did offer several suggestions:

- Do more marketing / promotion of the program. A few retailers specifically asked for more in-store promotions.
- Increase or widen available customer incentives. Retailers offered a variety of responses within this topic; some simply wanted customers to get a larger incentive for an energy efficiency measure

purchase and installation; other respondents wanted additional measures incented within the program offerings.
- Help with the program rebate form process and/or move to online applications.

Retailers stated that program measures provide good value to the participants, specifically:

- For ENERGY STAR window with the rebate they are the same price as standard windows
- The *takeCharge* rebate offset increased costs of electronic and/or programmable thermostats compared to manual units

### 8.1.2.3 Market Analysis

The evaluation period for this study was from 2009 through 2012, encompassing the program start-up phase through full scale implementation. Consequently, both program participants and non-participants have had a lengthy period of time to be exposed to the program. This was reflected in the high level of free ridership among customers and spill among non-participants. Sufficient time has elapsed that has the exhaustion of market opportunities in some regions, such for thermostats and ENERGY STAR windows in Labrador's region, albeit the smallest to the three regions. Table 8-1 through Table 8-3 show the free ridership and spill over for the *takeCHARGE* programs.

**Table 8-1: Free Ridership Estimates**

| Free-ridership Estimates | ENERGY STAR Windows | Programmable and Electronic Thermostats | Basement and Attic Insulation |
|---|---|---|---|
| Weighted: 50% likelihood/25% timing/25% quantity | 62% | 48% | 53% |
| Only on Likelihood | 53% | 54% | 64% |
| Only on Timing | 82% | 60% | 59% |
| Only on Quantity | 85% | 78% | 72% |

**Table 8-2: Participants Implementing Additional Measures and Spill Over Question Responses**

| Participants | Spill Over Weight | ENERGY STAR Windows | Insulation | Programmable/ Electronic Thermostats |
|---|---|---|---|---|
| Do you have additional measure opportunities? | | n=71 | n=67 | n=86 |
| Yes | | 35% | 33% | 24% |
| No | | 60% | 64% | 75% |
| Did your participation in the program influence your decision to make these additional measures? | | n=25 | n=22 | n=21 |
| Yes | 100% | 23% | 44% | 18% |
| No | 0% | 73% | 56% | 82% |
| Spill over Estimate | | 8% | 14% | 4% |
| Do you think you would have purchased and installed these additional measures if you had not participated in the program? | | n=25 | n=22 | n=21 |
| Yes | 0% | 87% | 84% | 91% |
| No | 100% | 13% | 16% | 9% |
| Spill over Estimate | | 5% | 5% | 2% |

**Table 8-3: Non-Participant Spill Over**

| Non-participants | Spill Over Weight | ENERGY STAR Windows | Insulation | Programmable/ Electronic Thermostats |
|---|---|---|---|---|
| Non-participants Who Installed Measures and Aware of Measures Offered in *takeCHARGE* | | n=75 | n=43 | n=76 |
| Yes | | 68% | 57% | 61% |
| No | | 28% | 41% | 33% |
| Based upon awareness, did you purchase measures that met the program requirements? | | n=51 | n=24 | n=47 |
| Yes | 100% | 73% | 87% | 66% |
| No | 0% | 18% | 5% | 34% |
| Spill over Estimate | | 0.50 | 49% | 40% |

### 8.1.2.4 Net Market Potential

This section summarizes the remaining market potential by program and geography. In all three programs, the high level of spill over attributable to non-participants helped to narrow the gap between the gross and net market potential estimates. However, this market analysis focused on four years of program experience, a length of time that can be sufficient to move the baseline practices of customers toward the energy efficient alternatives.

The net market potential was calculated for each *takeCHARGE* program as follows:

*Net Market Potential = Gross Market Potential – Free ridership + Spill Over*

It is important to recognize that customers can chose to participate in multiple programs. The program net potential numbers refer to total number of potential participants. This is particularly important regarding the *takeCHARGE* Insulation program. For example, if a customer participant installs attic

insulation and basement wall insulation, they are count as two participants with savings associated with the individual measures in the program.

Tables 8-4 and 8-5 summarize the net market potential for the *takeCHARGE* Programs. The market potential for each program by geography is shown in Table 8-6 through Table 8-8. Net market potential was based upon the following assumptions:

- Two program level market potential sums were created:
  - Maximum market potential assumed all participants and non-participants with additional measure opportunities install the measure. This value serves as the upper bound.
  - Market potential based upon the proportion of participants and non-participants who were aware of the program less the number of participants and non-participants who were not likely to install the measure.
- The free ridership value used in the analysis was the free ridership value based upon the responses to the likelihood of installing the measure, the influence of the rebate on the timing of the installation and the effect of the rebate on the quantity of the measure installed.
- The spill over for participants valued applied in the analysis was an average of the responses to the two spill over questions regarding the influence of the presence of the program on the purchasing decisions of the participants.

The high level of spill over attributable to non-participants helped to narrow the gap between the gross and net market potential estimates. However, this market analysis focused on four years of program experience, a length of time that can be sufficient to move the baseline practices of customers toward the energy efficient alternatives. This relationship will be discussed in greater detail in Section 6.3 regarding the exit strategies for the *takeCHARGE* programs.

**Table 8-4: Net Market Potential, Free Ridership and Spill Over– *takeCHARGE* Programs**

| | ***takeCHARGE* Insulation Program** | | | | ***takeCHARGE* ENERGY Star Windows Program** | | | | ***takeCHARGE* Thermostat Program** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| Free Ridership | 53% | | | | 62% | | | | 48% | | | |
| Spill Over | | | | | | | | | | | | |
| *Participant* | 5% | | | | 5% | | | | 2% | | | |
| *Non-Participant* | 49% | | | | 50% | | | | 40% | | | |
| **Net Market Potential=Gross Market Potential - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential | 122,642 | 62,466 | 48,377 | 11,799 | 23,785 | 14,291 | 8,620 | 874 | 42,611 | 26,925 | 14,589 | 1,097 |
| Potential % less those who Chose Not to Install - Total | 65,606 | 32,850 | 24,089 | 7,365 | 15,285 | 9,072 | 5,859 | 354 | 19,295 | 12,891 | 6,404 | 756 |

**Table 8-5: Net Market Potential – *takeCHARGE* Programs**

| | ***take*CHARGE Insulation Program** | | | | ***take*CHARGE ENERGY Star Windows Program** | | | | ***take*CHARGE Thermostat Program** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential | 129,344 | 66,177 | 50,841 | 12,326 | 29,352 | 17,946 | 10,397 | 1,010 | 47,813 | 30,171 | 16,457 | 1,185 |
| Potential % less those who Chose Not to Install - Total | 68,941 | 34,650 | 25,247 | 7,686 | 18,914 | 11,360 | 7,136 | 419 | 22,074 | 14,597 | 7,477 | 816 |
| **Net=Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential | 122,642 | 62,466 | 48,377 | 11,799 | 23,785 | 14,291 | 8,620 | 874 | 42,611 | 26,925 | 14,589 | 1,097 |
| Potential % less those who Chose Not to Install - Total | 65,606 | 32,850 | 24,089 | 7,365 | 15,285 | 9,072 | 5,859 | 354 | 19,295 | 12,891 | 6,404 | 756 |

**Table 8-6: Net Market Potential – *takeCHARGE* Insulation Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential | 129,344 | 66,177 | 50,841 | 12,326 | 3,675 | 2,609 | 1,006 | 60 | 125,669 | 63,568 | 49,836 | 12,265 |
| Potential % less those who Chose Not to Install - Total | 68,941 | 34,650 | 25,247 | 7,686 | 1,346 | 996 | 330 | 20 | 67,595 | 33,653 | 24,918 | 7,666 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential | 122,642 | 62,466 | 48,377 | 11,799 | 2,103 | 1,493 | 576 | 34 | 120,539 | 60,973 | 47,801 | 11,765 |
| Potential % less those who Chose Not to Install - Total | 65,606 | 32,850 | 24,089 | 7,365 | 770 | 570 | 189 | 12 | 64,836 | 32,280 | 23,901 | 7,353 |

The methodology used to derive the net market potential for the *takeCHARGE* insulation program was applied to the ENERGY STAR window program. Similar to the insulation program, the significant spill over in the non-participant sector narrows the difference between gross and net for ENERGY STAR windows. Furthermore, the penetration of ENERGY STAR windows in Labrador was extremely high exhausting the remaining market potential. Table 8-7 shows the net market potential results.

**Table 8-7: Net Market Potential – *takeCHARGE* ENERGY STAR Windows Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential Participants | 29,352 | 17,946 | 10,397 | 1,010 | 4,734 | 3,475 | 1,225 | 34 | 24,619 | 14,471 | 9,172 | 976 |
| Potential less % Chose Not to Install | 18,914 | 11,360 | 7,136 | 419 | 3,146 | 2,140 | 973 | 33 | 15,768 | 9,219 | 6,163 | 386 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential Participants | 23,785 | 14,291 | 8,620 | 874 | 2,120 | 1,556 | 548 | 15 | 21,665 | 12,735 | 8,072 | 859 |
| Potential less % Chose Not to Install | 15,285 | 9,072 | 5,859 | 354 | 1,409 | 958 | 436 | 15 | 13,876 | 8,113 | 5,423 | 340 |

Table 8-8 presents the net market potential in each of the region for the takeCHARGE Programmable and Electronic Thermostat Program. As discussed in the gross analysis, there is no remaining potential among participants for thermostats in the Labrador region based upon the responses in this survey. However, we reiterate that the findings from this size of survey sample may not be indicative of the population of eligible customers in Labrador. Again, high awareness of the program and its influence on purchasing patterns among non-participants yielded high spill over rates which drove up overall market potential.

**Table 8-8: Net Market Potential – *takeCHARGE* Programmable and Electronic Thermostat Program**

| | Total Program | | | | Participant | | | | Non-participant | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** | **Total** | **Avalon** | **Rest of Island** | **Labrador** |
| **Gross** | | | | | | | | | | | | |
| Max Number of Potential Participants | 47,813 | 30,171 | 16,457 | 1,185 | 4,562 | 2,780 | 1,781 | - | 43,251 | 27,391 | 14,676 | 1,185 |
| Potential less % Chose Not to Install | 22,074 | 14,597 | 7,477 | 816 | 3,128 | 1,712 | 1,416 | - | 18,946 | 12,885 | 6,061 | 816 |
| **Net = Gross - FR + SO** | | | | | | | | | | | | |
| Max Number of Potential Participants | 42,611 | 26,925 | 14,589 | 1,097 | 2,545 | 1,551 | 994 | - | 40,065 | 25,373 | 13,595 | 1,097 |
| Potential less % Chose Not to Install | 19,295 | 12,891 | 6,404 | 756 | 1,745 | 955 | 790 | - | 17,550 | 11,936 | 5,615 | 756 |

## 8.2 Key Recommendations

**Process and Program Design Recommendations**

Overall, the suite of *takeCHARGE* programs was operating smoothly and delivered a high level of satisfaction to customers, vendors and to the Utilities. However, there were several areas of program design and delivery that could be modified or strengthened.

- Continue to seek and implement procedures to streamline the participation burden on customers and retailers. Offering an on-line solution should help to achieve this objective but program staff should continue to monitor and proactively modify processes as needed.
- Build upon the existing relationship with retailers and identify ways to provide more one-on-one support. Perhaps consider increasing the frequency that program staff directly contact retailers or offer a program 'hot line' for retailers with questions.
- Examine the technical potential opportunities for offering new emerging technologies including:
  - Future home automation - smart thermostats
  - On-demand hot water systems.

**Market Analysis Recommendations**

The central recommendation stemming from the market analysis was what the next steps should be for the current configuration of the *takeCHARGE* programs. The results of this study indicate that the current *takeCHARGE* programs have effected changes in customers' and vendors' purchasing practices and creating a more efficient baseline market. The Utilities are now at a point when they are considering expanding their energy efficiency and examining their current offerings

Going forward the Utilities should give important consideration to the strong awareness of energy efficiency among existing customers and market actors (e.g., contractors, builders and retailers) and identified opportunities to leverage the residential construction boom in the region. DNV GL recommends that the Utilities should explore the following program options.

*Existing Homes Market*

4. Assess a Whole House Program or Bundle Energy Efficiency Measures

   A broader more comprehensive approach to the existing home market is to take whole house approach to energy efficiency. A whole house program would incentivize participants to implement all eligible measures rather than just installing a single measure e.g., attic insulation. This type of program focuses on improving the overall energy performance of the home and can potential capture additional savings opportunities. An alternative to the whole house approach would be to bundle a smaller sub-set of measures together e.g., attic insulation, basement ceiling and basement wall insulation with programmable thermostats.

5. Explore the Feasibility of a Secondary Refrigeration and Freezer Recycling Program

   Secondary refrigerators and freezers are not typically energy efficient. Secondary refrigerators are often the former primary refrigerators that have been replaced by homeowners with newer more efficient models. Secondary refrigerators that are in non-space conditioned areas (e.g., garages and basements) and are often fairly empty most of the year operate less efficiently. Utilities in the United States have implemented refrigeration and freezer recycling programs that remove the units from the grid. In these programs, refrigerators and freezers are picked up at

the customer's home free of charge by a utility sanctioned contractor, the customer receives a rebate and the units are then disposed of by the contractor in an environmentally appropriate manner. The Utilities should explore the penetration of secondary refrigerators and freezers in their service territory to assess the applicability of this type of program.

6. Consider Including Water Saving Measures

   Residential water saving measures including low flow shower heads and faucet aerators may provide a low cost way to reduce the energy consumption of water heaters. These could be coupled as part of a whole system or bundled program.

*New Construction Market*

3. Consider Implementing ENERGY STAR New Homes Program

   There has been a large influx of income into the Utilities' region which has resulted in boom in the residential construction market with new larger homes being built. The implementation of the National Energy Code of Canada has helped to established more rigorous energy efficiency standards in new homes. The code incorporates many of the measures included in the current *takeCHARGE* programs. However, there are opportunities to obtain additional savings in new homes. Offering an ENERGY STAR New Homes Program is one option to push the energy savings opportunities further. The ENERGY STAR New Homes program focuses on the total performance of the home by establishing efficiency requirements for shell measures and building practices that exceed building code requirements and by requiring the implementation of ENERGY STAR appliances. This type of program is quite different than the Utilities' existing rebate programs and will require training contractors and buildings on the ENERGY STAR implementation and performance criteria. Also, the program will require inspection and certification processes.

4. Examine the Feasibility of Implementing a R2000 Compliant Program

   Another option to consider for the new construction market is to take the energy savings to an even higher level is to design and implement a program that meets the performance criteria set forth in the R2000 program. As with the ENERGY STAR New Homes Program, the R2000 program would require training contractors and builders on the R2000 requirements and would need to include inspection and certification processes to determine if the home meets the standards of the program.

# 9 APPENDIX A – *TakeCHARGE* Participant Survey

**NEWFOUNDLAND/LABRADOR**
**RESIDENTIAL PARTICIANT CUSTOMER SURVEY**
**DRAFT (CATI)**

# 1 INTRODUCTION

**[TARGET: Trying to reach current owner or co-owner of home. If co-owners, respondent should have been involved in renovation decisions].**

**LEAD-IN:** Hello, my name is _____ and I am calling from Ryan Research on behalf of Newfoundland Power and Newfoundland and Labrador Hydro. The Utilities are conducting a study to help improve their residential energy efficiency programs.

[IF REQUESTED]: This study is sponsored by Newfoundland Power and Newfoundland and Labrador Hydro. For contact from the Utilities, please call <name>, <utility>, at <phone number>]

May I speak with the owner of your home?

- If owner is not home: record best time to call back.
  CALL BACK DATE/TIME: _____
- If owner lives elsewhere and/or has diff. phone #: record name, phone#, best time to call.

[REPEAT LEAD-IN FOR RESPONDENT IF NEEDED]

We are conducting a study of households who have recently completed renovations to their homes. takeCHARGE will use this information to help improve programs to benefit their residential customers.

I want to assure you that this is not a sales call and your answers will be strictly confidential.

[CONTINUE ON TO SCREENER]

# 2 SCREENER

S1. I'd like to first confirm, are you the owner or co-owner of [ADDRESS]?

1. Yes
2. No

-97. DK
-98. REF

IF YES ➔ GO TO S2
IF NO➔ - Ask for Owner's name and phone # and best time to call.
- If Contact has no connection to Address, record disposition, thank & terminate.
IF REFUSED ➔ Thank and Terminate

**S2.** Is your house a … **[READ LIST]**

1. Single-family home, detached from other homes
2. Attached home (e.g., A, townhouse or row house attached to other units)
3. A mobile home
4. (Other_____[SPECIFY]) ➔ **Thank and Terminate**

-97. (Don't know) ➔ **Thank and Terminate**
-98. (Refused) ➔ **Thank and Terminate**

**S3.** According to our records, since 2009, you received a rebate from [takeCHARGE] for one or more of the following energy efficiency measures. Is this correct? **[READ LIST]**

1. Installing ENERGY STAR windows
2. Adding insulation in the basement or attic
3. Adding a programmable and high performance electronic thermostat?

-97. (Don't know) ➔ **Thank and Terminate**
-98. (Refused) ➔ **Thank and Terminate**

# 3 PROJECT DETAILS

**Next, I'd like to ask you some questions about the renovation project(s) you completed.**

**[REPEAT QUESTION FOR EACH TYPE OF MEASURE FOR WHICH A REBATE WAS RECEIVED]**

**You indicated earlier that you had purchased <ENERGY STAR windows/insulation/thermostat> since 2009.**

**PD1. In which year did you install the <ENERGY STAR windows/insulation/thermostat>?**

| Year | PD1 |
|---|---|
| 2012 | 1 |
| 2011 | 2 |
| 2010 | 3 |
| 2009 | 4 |
| Don't know | -98 |
| Refused | -99 |

**PA1A. Who installed the <ENERGY STAR windows/insulation/thermostat>?**

| | |
|---|---|
| Member of household | 1 |
| Friend or family member outside of household | 2 |
| HVAC contractor | 3 |
| WindowRetailer or Specialty Store | 4 |
| Electrician | 5 |
| [Other] (Specify:_____) | 4 |
| [Don't know] | -97 |
| [Refused] | -98 |

**PD2. What was your main reason for installing <ENERGY STAR windows/insulation/thermostat>? [CODE RESPONSE INTO PRECODES BELOW, ACCEPT ONE ONLY, PROBE FURTHER FOR MAIN PURPOSE IF RESPONDENT MENTIONS > 1].**

**PD3. What were some of the other reasons for installing <ENERGY STAR windows/insulation/thermostat>? [READ LIST EXCLUDING PD2 RESPONSE FOR PD3, ACCEPT MULTIPLES FOR PD3]**

| Reason | PD2 | PD3 |
|---|---|---|
| Replace old or failing equipment | 1 | 1 |
| Add or reconfigure living space | 2 | 2 |
| Reduce energy use or costs | 3 | 3 |
| Repair or replace exterior of the house | 4 | 4 |
| Improve comfort [e.g. stop drafts; keep cooler in summer or warmer in winter] | 5 | 5 |
| Qualify for program rebates | 6 | 6 |
| Increase the value of the home | 7 | 7 |
| Other (Specify) _____ | 8 | 8 |
| Don't know | -98 | -98 |
| Refused | -99 | -99 |

**PD4. Which of the following ranges contains the total cost of the measures installed under the program?**
**[READ LIST. ACCEPT ONE ONLY.]**

| Project Cost | PD4 |
|---|---|
| Less than $500 | 1 |
| Between $500 and $1000 | 2 |
| Between $1,000 and $2,500 | 3 |
| Between $2,500 and $5,000 | 4 |
| Between $5,000 and $7,500 | 5 |
| $10,000 or more | 6 |
| Don't know | -98 |
| Refused | -99 |

**PD5. Did you use some form of credit, such as a credit card or loan to pay for the measure?**

| | | |
|---|---|---|
| Yes | 1 | PD6A |
| No | 2 | PD7 |
| Don't know | -98 | PD7 |
| Refused | -99 | PD7 |

**PD6A. How did you finance the purchase? [READ LIST. RANDOMIZE. OTHER IS ALWAYS LAST. ACCEPT MULTIPLES.] CODE 1 = YES; 2 = NO; -98 = DON'T KNOW; -99 = REFUSED.**

| Financing type | Code |
|---|---|
| Credit card | |
| Second mortgage or home equity line of credit | |
| Consumer loan from bank or finance company | |
| Installment loan from contractor or equipment vendor | |
| Other (Specify) _____ | |
| Don't know | -98 |
| Refused | -99 |

**PD7. Are there additional opportunities to install [ENERGY STAR Windows, more insulation, more programmable thermostats] in your home? [DO NOT READ. ACCEPT MULTIPLES.]**

| Measure | PD4 |
|---|---|
| Attic insulation | 1 |
| Basement insulation | 2 |
| ENERGY STAR windows | 3 |
| Programmable thermostat or other heating/cooling controls | 4 |
| Other (Specify) _____ | 5 |
| Don't know | -98 |
| Refused | -99 |

**PD 8. What was the main reason you did not install those measures as part of the project for which you received a rebate from [takeCHARGE? [DO NOT READ]**

**PD 9. Were there other reasons? [DO NOT READ, ACCEPT MULTIPLES]**

| Reason | PD8 | PD9 |
|---|---|---|
| Could not afford to do more/ran out of money | 1 | 1 |
| Did not think the savings justified the costs | 2 | 2 |
| Did not fit with other aspects of the overall project | 3 | 3 |
| Was not convenient to do the measure at that time | 4 | 4 |
| No additional reasons | 5 | 5 |
| The rebate application was complicated/lengthy to complete | 6 | 6 |
| Other (Specify) _____ | 7 | 7 |
| Don't know | -98 | -98 |
| Refused | -99 | -99 |

**Now, I would like to ask you about the importance of rebates offered for basement and attic insulation under the takeCHARGE program.**

**PD10. How important is it to know the exact amount of the insulation before you would participate in the program?**

| | | |
|---|---|---|
| Very important | 1 | PD10 |
| Somewhat important | 2 | PD10 |
| Neutral | 3 | PD10 |
| Somewhat unimportant | 4 | PD10 |
| Very unimportant | 5 | PD10 |
| Don't know | -98 | PD10 |
| Refused | -99 | PD10 |

**PD11. Does knowing the exact amount of insulation rebate make you more likely to participate in the takeCHARGE program?**

| | | |
|---|---|---|
| Yes | 1 | CR1 |
| No | 2 | CR1 |
| Don't know | -98 | CR1 |
| Refused | -99 | CR1 |

# 4 ROLE OF THE CONTRACTORS AND RETAILERS

I'd like to ask you a few questions about the <retailer or contractor> you contacted about purchasing or installing <ENERGY STAR windows/insulation/thermostat>.

**CR1. Were you aware of the takeCHARGE rebates before you contacted a contractor or retailer about purchasing and installing your <ENERGY STAR windows/insulation/thermostat>?**

| | | |
|---|---|---|
| 1 | [Yes] | CR2 |
| 2 | [No] | CR2 |
| -97 | [Don't know] | CR2 |
| -98 | [Refused] | CR2 |

**CR2. Before speaking to your contractor or retailer, did you have any type or model of <ENERGY STAR windows/insulation/thermostat> in mind?**

| | | |
|---|---|---|
| 1 | [Yes] | CR2A |
| 2 | [No] | CR3 |
| -97 | [Don't know] | CR3 |
| -98 | [Refused] | CR3 |

**CR2A. What type or model of <ENERGY STAR windows/insulation/thermostat> did you have in mind?** [READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| 1 | [Something similar to what he had before] | CR3 |
| 2 | [An energy-efficient model] | CR3 |
| 3 | [Reliable model/ one with good warranty] | CR3 |
| 4 | [A certain brand] | CR3 |
| 5 | [An inexpensive model | CR3 |
| 6 | [Other] [RECORD RESPONSE] | CR3 |
| -97 | [Don't know] | CR3 |
| -98 | [Refused] | CR3 |

**CR3. What role, if any, did your contractor or retailer play in helping you select the <ENERGY STAR windows/insulation/thermostat>that you installed?**
[DON'T READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| 1 | [No role] | CR4 |
| 2 | [Provided cost estimates/bids] | CR4 |
| 3 | [Recommended specific equipment/brand] | CR4 |
| 4 | [Recommended high efficiency model] | CR4 |
| 5 | [Identified equipment eligible for rebates] | CR4 |
| 6 | [Informed us about [ttakeCHARGE]] program | CR4 |
| 7 | [Encouraged us to replace windows when we did] | CR4 |
| 8 | [Helped estimate energy savings] | CR4 |
| 9 | [Provided info about comfort levels of different windows] | CR4 |
| 10 | [Provided info about reliability of different windows] | CR4 |
| 11 | [Helped estimate Return-on-Investment (ROI) or payback] | CR4 |
| 12 | [Other] [RECORD RESPONSE] | CR4 |
| -97 | [Don't know] | CR4 |
| -98 | [Refused] | CR4 |

**CR4. What features, if any, of the <ENERGY STAR windows/insulation/thermostat> that you selected did your contractor or retailer emphasize?** [DON'T READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| 1 | [No features] | CR4A |
| 2 | [Cheap, low price] | CR4A |
| 3 | [Energy efficient] | CR4A |
| 4 | [Quiet] | CR4A |
| 5 | [Good warranty/reliability] | CR4A |
| 6 | [Certain brand] | CR4A |
| 7 | [Easy to use] | CR4A |
| 8 | [Other] [RECORD RESPONSE] | CR4A |
| 9 | [It was endorsed by the utility] | |
| -97 | [Don't know] | CR4A |
| -98 | [Refused] | CR4A |

**CR5. Did the contractor or retailer present you with multiple models to choose from?**

| | | |
|---|---|---|
| 1 | [Yes] | CR6 |
| 2 | [No] | CR7 |
| -97 | [Don't know] | CR7 |
| -98 | [Refused] | CR7 |

**CR6. Did the contractor or retailer present you with price quotes for these various options?**

| | | |
|---|---|---|
| 1 | [Yes] | CR7 |
| 2 | [No] | CR7 |
| -97 | [Don't know] | CR7 |
| -98 | [Refused] | CR7 |

**CR7. Did you feel that the energy-efficient options were significantly more expensive than the alternatives?**

| | | |
|---|---|---|
| 1 | [Yes] | CR8 |
| 2 | [No] | CR8 |
| -97 | [Don't know] | CR8 |
| -98 | [Refused] | CR8 |

**CR8. What was the most important reason you chose to go with the <ENERGY STAR windows/insulation/thermostat>?**
[DON'T READ OPTIONS. ACCEPT ONE ONLY.]

| | | |
|---|---|---|
| 1 | [Our contractor recommended it] | CR9 |
| 2 | [We wanted to reduce our utility/energy bills] | CR9 |
| 3 | [We wanted a rebate from [takeCHARGE] | CR9 |
| 4 | [We wanted to help the environment/ Reduce global warming] | CR9 |
| 5 | [Other] [RECORD RESPONSE] | CR9 |
| -97 | [Don't know] | DAT0 |
| -98 | [Refused] | DAT0 |

**CR9. Were there other reasons?** [DO NOT READ. ACCEPT MULTIPLES].

| | | |
|---|---|---|
| 1 | [Our contractor recommended it] | DAT0 |
| 2 | [We wanted to reduce our utility/energy bills] | DAT0 |
| 3 | [We wanted a rebate from [takeCHARGE | DAT0 |
| 4 | [We wanted to help the environment/ Reduce global warming] | DAT0 |
| 5 | [Other] [RECORD RESPONSE] | DAT0 |
| -97 | [Don’t know] | DAT0 |
| -98 | [Refused] | DAT0 |

# 5 DIRECT ATTRIBUTION

**DAT0.** **Next, I'd like to know about the effect, if any, that the program had on your decision to install <ENERGY STAR windows/insulation/thermostat>. How likely is it that you would have installed the <ENERGY STAR windows/insulation/thermostats> if you had not received the rebate from the utility program? Would you say that it was "very likely," "somewhat likely," "not very likely," or "not at all likely"?**

| | | |
|---|---|---|
| 1 | Very unlikely | DAT1a |
| 2 | Not very likely | DAT1a |
| 3 | Somewhat likely | DAT1a |
| 4 | Or very likely | DAT1a |
| -97 | [Don't know] | DAT1a |
| -98 | [Refused] | DAT1a |

**DAT1a.** **I'd like to know about the effect, if any, that the rebate from the program had the timing of your purchase of <ENERGY STAR windows/insulation/thermostats>. Without the rebate would you have purchased the <ENERGY STAR windows/insulation/thermostat>at the same time, earlier, later, or never?**

| | | |
|---|---|---|
| 1 | At the same time | DAT1a_conf_1 |
| 2 | Earlier | DAT1a_conf_1 |
| 3 | Later | DAT1a_conf_1 |
| 4 | Never | DAT1a_conf_1 |
| -97 | [Don't know] | DAT1a_conf_1 |
| -98 | [Refused] | DAT1a_conf_1 |

**DAT1a_conf1.** **[IF DAT0 = 1 very likely AND DAT1a = 1 same time ELSE SKIP TO DAT1a_conf2] I'd just like to confirm, you said that without the program, you were very unlikely to purchase an <ENERGY STAR windows/insulation/thermostat> at all and, the program did not affect the timing of your purchase? Is that correct?**

| | | |
|---|---|---|
| 1 | [Yes] | DAT1b |
| 2 | [No] | DAT0 |
| -97 | [Don't know] | DAT0 |
| -98 | [Refused] | DAT0 |

**DAT1a_conf2.** [IF DAT0 = 4 very likely AND DAT1a = 4 never ELSE SKIP TO DAT1b] **I'd just like to confirm, you said that without the program, you were very likely to purchase <ENERGY STAR windows/insulation/thermostat>? Is that correct?**

| | | |
|---|---|---|
| 1 | [Yes] | DAT1b |
| 2 | [No] | DAT0 |
| -97 | [Don't know] | DAT0 |
| -98 | [Refused] | DAT0 |

**DAT1b.** [IF DAT1a ≠ 3, SKIP TO DAT2a] **Approximately how many months later?**

| | | |
|---|---|---|
| | [RECORD # months] | DAT2 |
| -97 | [Don't know] | DAT2 |
| -98 | [Refused] | DAT2 |

**DAT2.** **Finally, I'd like to know about the effect, if any, that program incentives and services had on the quantity of <ENERGY STAR windows/insulation/thermostat> that you purchased. Without the program would you have purchased the same amount of <ENERGY STAR windows/insulation/thermostat> as you did, <fewer ENERGY STAR windows/less insulation/fewer thermostats> than you did, more <ENERGY STAR windows/insulation/thermostat>, or none at all?**

| | | |
|---|---|---|
| 1 | [Same number/size] | DAT4 |
| 2 | [Fewer/smaller] | DAT3a |
| 3 | [More/larger] | DAT3a |
| 4 | [None at all] | DAT4 |
| -97 | [Don't know] | DAT4 |
| -98 | [Refused] | DAT4 |

# 6 SPILLOVER

**SO1 Did you implement any additional energy efficiency measures at this home since your participation in the program that did not receive incentives through the takeCHARGE programs?**

| | | |
|---|---|---|
| Yes | 1 | SO1a |
| No | 2 | SO2 |
| Don't Know | -98 | SO2 |
| Refused | -99 | SO2 |

**SO1a** [If SO2=YES] What equipment has been installed?
[For each equipment mentioned, record name of equipment and quantity of equipment]

| | |
|---|---|
| Measure: _____ | |
| Quantity: _____ | |
| Don't Know | -98 |
| Refused | -99 |

**SO2 Did your participation in the <ENERGY STAR windows/insulation/thermostat> program influence your decision to make these additional improvements?**

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't Know | -98 |
| Refused | -99 |

**SO2a** [If SO2=No] What prompted you to install this equipment?

| | |
|---|---|
| Record response: _____ | |
| Don't Know | -98 |
| Refused | -99 |

**SO2b** [If SO2=YES] What aspects of the program influenced your decision to install them?
[Probe: energy savings, increased comfort etc.]

| | |
|---|---|
| Record response: _____ | |
| Don't Know | -98 |
| Refused | -99 |

**SO3 Do you think you would have purchased and installed these additional measures if you had not participated in the <ENERGY STAR windows/insulation/thermostat> program?**

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't Know | -98 |
| Refused | -99 |

**SO4 Since participating in the utility program, have you made any changes in the way you manage energy use at home?**

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't Know | -98 |
| Refused | -99 |

**SO4a [If SO4=Yes] Please describe those changes?**

| | |
|---|---|
| Record response: _____ | |
| Don't Know | -98 |
| Refused | -99 |

**SO5b Did your participation in the <ENERGY STAR windows/insulation/thermostat> program influence your decision to make these additional improvements?**

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't Know | -98 |
| Refused | -99 |

# 7 PROGRAM SATISFACTION

**Next I have some questions about how satisfied you are with different aspects of the takeCHARGE <ENERGY STAR windows/insulation/thermostat> Program.**

**For all of these questions, use a 5 point scale where 5 means very satisfied and 1 means very *dis*satisfied**

**[REPEAT QUESTION FOR EACH TYPE OF REBATE EQUIPMENT INSTALLED]**

**PS1. How satisfied or dissatisfied are you with the <ENERGY STAR windows/insulation/thermostat> you had installed?**

| | | |
|---|---|---|
| Not at all satisfied | 1 | PS1a |
| | 2 | PS1a |
| | 3 | PS1a |
| | 4 | PS2 |
| Very satisfied | 5 | PS2 |
| Don't know | -98 | PS2 |
| Refused | -99 | PS2 |

**PS1a.** [IF PS1 = 1 OR 2] **Why do you say that?**

| | |
|---|---|
| RECORD VERBATIM | |
| Don't know | -98 |
| Refused | -99 |

**PS2. How about the dollar amount of the rebate?** [REPEAT SCALE IF NECESSARY]

| | | |
|---|---|---|
| Not at all satisfied | 1 | PS2a |
| | 2 | PS2a |
| | 3 | PS2a |
| | 4 | PS3 |
| Very satisfied | 5 | PS3 |
| [Don't know] | -98 | PS3 |
| [Refused] | -99 | PS3 |

**PS2a.** [IF PS2 = 1 OR 2] **Why do you say that?**

| | |
|---|---|
| RECORD VERBATIM | |
| Don't know | -98 |
| Refused | -99 |

**PS3. How satisfied were you with the timeliness of the rebate payment?**

| | | |
|---|---|---|
| Not at all satisfied | 1 | PS3a |
| | 2 | PS3a |
| | 3 | PS3a |
| | 4 | PS4 |
| Very satisfied | 5 | PS4 |
| [Don't know] | -98 | PS4 |
| [Refused] | -99 | PS4 |

**PS4. How about the rebate application forms and other paperwork?**

| | | |
|---|---|---|
| [Did not fill out rebate paperwork] | 1 | PS5 |
| Not at all satisfied | 2 | PS4a |
| | 3 | PS4a |
| | 4 | PS4a |
| | 5 | PS5 |
| Very satisfied | -98 | PS5 |
| [Don't know] | -99 | PS5 |
| [Refused] | | PS5 |

**PS5. [If PA3=3; Else skip to PS6] How satisfied or dissatisfied are you with the retailer or contractor you contact regarding your <ENERGY STAR WINDOWS/INSULATION/Thermostat>**

| | | |
|---|---|---|
| Not at all satisfied | 1 | PS5a |
| | 2 | PS5a |
| | 3 | PS5a |
| | 4 | PS6 |
| Very satisfied | 5 | PS6 |
| [Don't know] | -98 | PS6 |
| [Refused] | -99 | PS6 |

**PS5a.** [IF PS5 = 1 OR 2] **Why do you say that?**

| | |
|---|---|
| RECORD VERBATIM | |
| Don't know | -98 |
| Refused | -99 |

**PS6. Since having your new <ENERGY STAR windows/insulation/thermostat>have you noticed any reductions in your energy bills?**

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Don't know | -98 |
| Refused | -99 |

# 8 DEMOGRAPHICS

**We're almost finished. I have just a few more questions to make sure we are getting a representative sample of Newfoundland Power and Newfoundland and Labrador Hydro customers.**

**D1. Which of the following best describes your age? Would you say… [READ LIST.]**

| | | |
|---|---|---|
| 1 | Less than 18 years old, | |
| 2 | 18 to 24 | |
| 3 | 25 to 34 | |
| 4 | 35 to 44 | |
| 5 | 45 to 54 | D2 |
| 6 | 55 to 64 or | |
| 7 | 65 or older | |
| -98 | [Refused] | |
| -99 | [Don't know] | |

**D2. What is the highest level of education you have completed? [DO NOT READ LIST. PROMPT IF NECESSARY.]**

| | | |
|---|---|---|
| 1 | [No schooling] | |
| 2 | [Less than high school] | |
| 3 | [Some high school] | |
| 4 | [High school graduate or equivalent (e.g., GED)] | |
| 5 | [Trade or technical school] | |
| 6 | [Some college] | D3 |
| 7 | [College degree] | |
| 8 | [Some graduate school] | |
| 9 | [Graduate degree] | |
| -98 | [Refused] | |
| -99 | [Don't know] | |

**D3. What was your annual household income from all sources in 2012, before taxes? Please stop me when I reach the category that best describes your household's income. Would you say…**
**[READ LIST]**
**[IF NECESSARY: "This information is confidential and will only be used for the purpose of characterizing study respondents."]**

| | | |
|---|---|---|
| 1 | Less than $20,000 per year, | D4 |
| 2 | 20 to less than $40,000, | |
| 3 | 40 to less than $60,000, | |
| 4 | 60 to less than $80,000, | |
| 5 | 80 to less than $100,000, | |
| 6 | 100 to less than $150,000, or | |
| 7 | $150,000 or more? | |
| -98 | Refused | |
| -99 | Don't know | |

**D4. Including yourself, how many people live in your home more than nine months of the year?**

| | | |
|---|---|---|
| 1 | 1 | D5 |
| 2 | 2 | D5 |
| 3 | 3 | D5 |
| 4 | 4 | D5 |
| 5 | 5 | D5 |
| 6 | 6 | D5 |
| 7 | >6 | D5 |
| -98 | Refused | D6 |
| -99 | Don't know | D6 |

**D5. For the people living in your home more than nine months a year, how many are in each of the following age groups?**

**[READ AND RECORD RESPONSES]**

| | | |
|---|---|---|
| 1 | < 18 years old | D6 |
| 2 | 19 to 25 years old | D6 |
| 3 | 25 to 40 years old | D6 |
| 4 | 41 to 50 years old | D6 |
| 5 | 51 to 65 years old | D6 |
| 6 | >65 years old | D6 |
| -98 | Refused | D6 |
| -99 | Don't know | D6 |

**D6. What year was your home built?**

| | | |
|---|---|---|
| Record number _____ | 1 | D7 |
| Don't know | -98 | D7 |
| Refused | -99 | D7 |

**D7. What is the square footage of your home?**

| | | |
|---|---|---|
| 1 | Less than 90 square meters | D8 |
| 2 | 90 – 150 square meters | |
| 3 | 150 – 190 square meters | |
| 4 | 190 – 250 square meters | |
| 5 | 250 – 300 square meters | |
| 6 | More than 300 square meters | |
| -98 | Refused | |
| -99 | Don't know | |

**D8. How many stories is your home?**

| | | |
|---|---|---|
| 1 | 1 | END_0 or 1 |
| 2 | 2 | |
| 3 | 3 | |
| 4 | >3 | |
| -98 | Refused | |
| -99 | Don't know | |

## 9 WRAP UP

**END_0.** **Okay, great. Today we're trying to reach customers who have <u>not</u> participated in any of BWL's programs, so I don't have any more questions for you today. Thank you for your time.**

**END_1.** **Those are all of the questions I have for you today. Thank you for your time.**

These are all the questions I have for you today. Thank you for your time and cooperation.

# 10 APPENDIX B - *TakeCHARGE* Non-Participant Survey

**NEWFOUNDLAND/LABRADOR**
**RESIDENTIAL NON-PARTICIANT CUSTOMER SURVEY**
**FINAL (CATI)**

# 1 INTRODUCTION

**[TARGET: Trying to reach current owner or co-owner of home. If co-owners, respondent should have been involved in renovation decisions].**

**LEAD-IN:** Hello, my name is _____ and I am calling from Discovery Research on behalf of Newfoundland Power and Newfoundland and Labrador Hydro. The Utilities are conducting a study to help improve their residential energy efficiency programs.

[IF REQUESTED]: This study is sponsored by Newfoundland Power and Newfoundland and Labrador Hydro. For contact from the Utilities, please call <name>, <utility>, at <phone number>]

May I speak with the owner of your home?

- If owner is not home: record best time to call back.
  CALL BACK DATE/TIM E: _____
- If owner lives elsewhere and/or has diff. phone #: record name, phone#, best time to call.

[REPEAT LEAD-IN FOR RESPONDENT IF NEEDED]

I want to assure you that this is not a sales call and your answers will be strictly confidential.

[CONTINUE ON TO SCREENER]

# 2 SCREENER

**S1. I'd like to first confirm, are you the owner or co-owner of your home?**

| | | |
|---|---|---|
| Yes | 1 | IF YES ➔ GO TO S2 |
| No | 2 | IF NO➔ - Ask for Owner's name and phone # and best time to call. - If Contact has no connection to Address, record disposition, thank & terminate. |
| Don't know | -98 | **Thank and Terminate** |
| Refused | -99 | **Thank and Terminate** |

**S2. Is the primary fuel used to heat your home electricity?**

| | | |
|---|---|---|
| Yes | 1 | IF YES ➔ GO TO S3 |
| No | 2 | **Thank and Terminate** |
| Don't know | -98 | **Thank and Terminate** |
| Refused | -99 | **Thank and Terminate** |

**S3. Since 2009, have you participated in Newfoundland Power or Newfoundland and Labrador Hydro's takeCHARGE programs ?**

| | | |
|---|---|---|
| Yes | 1 | **Thank and Terminate** |
| No | 2 | IF NO➔ PA1 |
| Don't know | -98 | **Thank and Terminate** |
| Refused | -99 | **Thank and Terminate** |

**S4. Is your house a … [READ LIST]**

| | | |
|---|---|---|
| Single Family home | 1 | S5 |
| Attached home (e.g., A, townhouse or row house attached to other units) | 2 | S5 |
| A mobile home | 3 | S5 |
| Other (specify) _____ | 4 | **Thank and Terminate** |
| Don't know | -98 | **Thank and Terminate** |
| Refused | -99 | **Thank and Terminate** |

**S5. Have you or anyone in your household purchased attic or basement insulation since 2009?**

| | | |
|---|---|---|
| Yes | 1 | S6 |
| No | 2 | S6 |
| Don't know | -98 | S6 |
| Refused | -99 | S6 |

**S6. Have you or anyone else in your household purchased a new thermostat since 2009?**

| | | |
|---|---|---|
| Yes | 1 | S7 |
| No | 2 | S7 |
| Don't know | -98 | S7 |
| Refused | -99 | S7 |

**S7. Have you or anyone in your household purchased new windows since 2009?**

| | | |
|---|---|---|
| Yes | 1 | PA1 |
| No | 2 | PA1 |
| Don't know | -98 | PA1 |
| Refused | -99 | PA1 |

# 3 PROGRAM AWARENESS

**PA1 Prior to this call, were you aware of the Newfoundland Power and Newfoundland and Labrador Hydro's takeCHARGE programs that provide rebates for energy efficient equipment?**

| | | |
|---|---|---|
| Yes | 1 | PA2 |
| No | 2 | PA5 |
| Don't know | -98 | PA5 |
| Refused | -99 | PA5 |

**PA2. What types of energy efficient equipment discounts or energy related services are you aware takeCHARGE offers?**

[DO NOT READ LIST. ACCEPT MULTIPLE ANSWERS]

| | | |
|---|---|---|
| None | 0 | PA5 |
| Basement insulation | 1 | PA3 |
| Attic insulation | 2 | PA3 |
| ENERGY STAR Windows | 3 | PA3 |
| Programmable thermostats | 4 | PA3 |
| Electronic thermostats | 5 | PA3 |
| Other | 6 | PA3 |
| Don't know | -98 | PA5 |
| Refused | -99 | PA5 |

**PA3. Why haven't you participated in any of the takeCHARGE programs?**

[ALLOW MULTIPLE RESPONSES. DO NOT READ RESPONSES]

| | |
|---|---|
| Did not know about rebates | 1 |
| Did not purchase eligible equipment / no opportunity | 2 |
| Did not qualify for rebates | 3 |
| Didn't find out about program until too late | 4 |
| My energy/utility bills are not that high | 5 |
| No time | 6 |
| Personal preference | 7 |
| Rebates not big enough to justify hassle/paperwork | 8 |
| Rebates not enough to justify high initial cost of eligible equipment | 9 |
| Was going to buy equipment anyway | 10 |
| Don't know | -98 |
| Refused | -99 |

[ASK IF S5=1 AND PA1=1, ELSE GO TO IS1]

**PA4. How important is it to know the exact amount of the insulation rebate you would be eligible for under the takeCHARGE program?**

| | | |
|---|---|---|
| Very important | 1 | PA5 |
| Somewhat important | 2 | PA5 |
| Neutral | 3 | PA5 |
| Somewhat unimportant | 4 | PA5 |
| Very unimportant | 5 | PA5 |
| Don't know | -98 | PA5 |
| Refused | -99 | PA5 |

**PA5. If you did know the amount of insulation rebate, would you be more likely to participate in the takeCHARGE program?**

| | | |
|---|---|---|
| Yes | 1 | IS1 |
| No | 2 | IS1 |
| Don't know | -98 | IS1 |
| Refused | -99 | IS1 |

# 4 INSULATION

**[ASK ALL RESPONDENTS]**

**Next, I would like to ask a few questions about the insulation currently installed in your home, starting with the exterior walls in your basement.**

**IS1. Approximately what percentage of the exterior basement walls is insulated?**

| | | |
|---|---|---|
| None | 1 | IS6 |
| 25% | 2 | IS2 |
| 50% | 3 | IS2 |
| 75% | 4 | IS2 |
| 100% | 5 | IS2 |
| Don't know | -98 | IS1a |
| Refused | -99 | IS2 |

**IS1a. Do you think your basement walls are adequately insulated?**

| | | |
|---|---|---|
| Yes | 1 | IS2 |
| No | 2 | IS2 |
| Don't know | -98 | IS2 |
| Refused | -99 | IS2 |

**IS2. For the exterior walls in your basement, what type of insulation is present?**
[READ LIST. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Blanket – batt or roll | 1 | IS3 |
| Foam board insulation | 2 | IS5 |
| Loose fill insulation | 3 | IS3 |
| Spray foam insulation | 4 | IS5 |
| Don't know | -98 | IS6 |
| Refused | -99 | IS6 |

**IS3. What is the R-value of the <blanket insulation/loose fill insulation> in the exterior walls of your basement?**

[ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than R-12 | 2 | IS6 |
| R-12 | 3 | IS4 |
| R-12 to R-20 | 4 | IS4 |
| R-20 | 5 | IS4 |
| R-20 to R-25 | 6 | IS4 |
| R-25 or more | 7 | IS4 |
| Don't know | -98 | IS6 |
| Refused | -99 | IS6 |

**IS4. Approximately what is the thickness of the <blanket insulation/loose fill insulation> in your exterior basement walls?**

[DO NOT READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than 3 inches | 1 | IS6 |
| 3 to 5 inches | 2 | IS6 |
| 6 inches | 3 | IS6 |
| More than 6 inches | 4 | IS6 |
| Don't know | -98 | IS6 |
| Refused | -99 | IS6 |

**IS5. Approximately what is the thickness of the <foam board insulation/spray foam insulation> in the exterior basement walls?**

[DO NOT READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than one inch | 1 | IS6 |
| 1 to 2 inches | 2 | IS6 |
| 2 to 3 inches | 3 | IS6 |
| More than 3 inches | 4 | IS6 |
| Don't know | -98 | IS6 |
| Refused | -99 | IS6 |

**Next, I would like to ask you a few questions about basement ceiling insulation.**

**IS6. Approximately what percentage of the basement ceiling is insulated?**

| | | |
|---|---|---|
| None | 1 | IS11 |
| 25% | 2 | IS7 |
| 50% | 3 | IS7 |
| 75% | 4 | IS7 |
| 100% | 5 | IS7 |
| Don't know | -98 | IS11 |
| Refused | -99 | IS11 |

**IS7. For the part of your basement ceiling that is insulation, what type of insulation is present?**

[READ LIST. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Blanket – batt or roll | 1 | IS8 |
| Foam board insulation | 2 | IS10 |
| Loose fill insulation | 3 | IS8 |
| Spray foam insulation | 4 | IS10 |
| Don't know | -98 | IP11 |
| Refused | -99 | IP11 |

**IS8. What is the R-value of the <blanket insulation/loose fill insulation> in the basement ceiling?**

[ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than R-20 | 1 | IS11 |
| R-20 to R-30 | 2 | IS9 |
| R-30 to R35 | 3 | IS9 |
| R-35 or more | 4 | IS9 |
| Don't know | -98 | IS11 |
| Refused | -99 | IS11 |

**IS9. Approximately what is the thickness of the <blanket insulation/loose fill insulation> in your basement ceiling?**

[DO NOT READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than 6 inches | 1 | IS11 |
| 6 to 12 inches | 2 | IS11 |
| More than 12 inches | 3 | IS11 |
| Don't know | -98 | IS11 |
| Refused | -99 | IS11 |

**IS10. Approximately what is the thickness of the <foam board insulation/spray foam insulation> in your basement ceiling?**

[DO NOT READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than one inch | 1 | IS11 |
| 1 to 2 inches | 2 | IS11 |
| 2 to 3 inches | 3 | IS11 |
| More than 3 inches | 4 | IS11 |
| Don't know | -98 | IS11 |
| Refused | -99 | IS11 |

**Next, I would like to ask you a few questions about your attic/crawl space insulation.**

**IS11. Approximately what percentage of the attic/crawl space is insulated?**

| | | |
|---|---|---|
| None | 1 | IS16 |
| 25% | 2 | IS12 |
| 50% | 3 | IS12 |
| 75% | 4 | IS12 |
| 100% | 5 | IS12 |
| Don't know | -98 | IP16 |
| Refused | -99 | IP16 |

**IS12. For the part of your attic/crawl space that is insulated, what type of insulation is present?**

[READ LIST. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Blanket – batt or roll | 1 | IS15 |
| Foam board insulation | 2 | IS17 |
| Loose fill insulation | 3 | IS15 |
| Spray foam insulation | 4 | IS17 |
| Don't know | -98 | IP1 |
| Refused | -99 | IP1 |

**IS13. What is the R-value of the <blanket insulation/loose fill insulation> in the attic/crawl space?**

[ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than R-20 | 1 | IS14 |
| R-20 to R-30 | 2 | IS14 |
| R-30 to R35 | 3 | IS14 |
| R-35 or more | 4 | IS14 |
| Don't know | -98 | IS16 |
| Refused | -99 | IS16 |

**IS14. Approximately what is the thickness of the <blanket insulation/loose fill insulation> in your attic/crawl space?**

[DO NOT READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than 6 inches | 1 | IS16 |
| 6 to 12 inches | 2 | IS16 |
| More than 12 inches | 3 | IS16 |
| Don't know | -98 | IS16 |
| Refused | -99 | IS16 |

**IS15. Approximately what is the thickness of the <foam board insulation/spray foam insulation> in your attic/crawl space?**

[DO NOT READ. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Less than one inch | 1 | IS16 |
| 1 to 2 inches | 2 | IS16 |
| 2 to 3 inches | 3 | IS16 |
| More than 3 inches | 4 | IS16 |
| Don't know | -98 | IS16 |
| Refused | -99 | IS16 |

**[READI IF S5=1, ELSE SKIP TO TS1]**

**Now I'd like to ask a few questions about the insulation you have installed in your home since 2009.**

**IS16. Which of the following kinds of insulation have you installed in home since 2009?**

| | | |
|---|---|---|
| Basement wall insulation | 1 | IS17 |
| Basement ceiling insulation | 2 | IS17 |
| Attic or crawl space insulation | 3 | IS17 |
| Don't know | -98 | IS17 |
| Refused | -99 | IS17 |

**IS17. Is your basement heated?**

| | | |
|---|---|---|
| Yes – 100% | 1 | IP1 |
| Partially - >50% | 2 | IP1 |
| Partially <50% | 3 | IP1 |
| No | 4 | IP1 |
| Don't know | -98 | IP1 |
| Refused | -99 | IP1 |

## PURCHASE EXPERIENCE

**IP1. Where did you purchase your insulation?**
**[ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Contractor | 1 |
| Home improvement/hardware store (Ace, Home Depot, True Value) | 2 |
| Manufacturer | 3 |
| Someone else purchased | 5 |
| Internet | 6 |
| Other (specify) | 7 |
| Don't know | -98 |
| Refused | -99 |

**IP2. Who installed the insulation?**

**[ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Member of household | 1 |
| Friend or family member outside of household | 2 |
| Contractor | 3 |
| Other (Specify:_____) | 4 |
| Don't know | -98 |
| Refused | -99 |

## ENERGY EFFICIENCY AWARENESS

**IA1. When you were shopping for the insulation you purchased, were you aware of the recommended minimum levels of <basement wall, basement ceiling, attic/crawl space> insulation of < R12, R20, R32>?**

| | | |
|---|---|---|
| Yes | 1 | IA2 |
| No | 2 | TS1 |
| Don't know | -98 | TS1 |
| Refused | -99 | TS1 |

**IA2. How did you learn about recommended ……?**

[DO NOT READ LIST. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Consumer Reports or other product-oriented magazines] | 1 | IA3 |
| Other magazines | 2 | IA3 |
| Electric utility | 3 | IA3 |
| Retailers or salesperson | 4 | IA3 |
| Contractors | 5 | IA3 |
| Friend, neighbor, relative, or co-worker | 6 | IA3 |
| Internet | 7 | IA3 |
| Newspaper | 8 | IA3 |
| Radio | 9 | IA3 |
| Television | 10 | IA3 |
| Other (RECORD) _____ | 11 | IA3 |
| Don't know/Not sure/Can't remember | -98 | IA3 |
| Refused | -99 | IA3 |

**IA3. Based upon this information, did you purchase insulation that met or exceeded the minimum recommended R values for the insulation?**

| | | |
|---|---|---|
| Yes | 1 | TS1 |
| No | 2 | IA4 |
| Don’t know | -98 | IA4 |
| Refused | -99 | IA4 |

**IA4. Why did you choose not to purchase insulation that met or exceeded the minimum recommended R values?**

| | | |
|---|---|---|
| Too expensive | 1 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |
| The dealer/ contractor didn’t recommend it | 2 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |
| A consumer magazine didn’t recommend it | 3 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |
| I prefer another brand/manufacturer | 4 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |
| Wasn’t in stock / Not quickly available | 5 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |
| Other(RECORD)_____ | 6 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |
| Don’t know/ Not sure/ Can't remember | -98 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |
| Refused | -99 | IF S7=1GO TO W1 OTHERWISE GO TO D1 |

# 5 THERMOSTATS

**[ASK OF ALL RESPONDENTS]**

I would like to ask you a few questions about the thermostats in your home.

## SATURATION

**TS1. What is the total number of thermostats in your home?**

| | |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 12 | 12 |
| 14 | 14 |
| 15 | 15 |
| >15 | 16 |
| Don't know | -98 |
| Refused | -99 |

**TS2. How many of your thermostats are:**
**[READ AND RECORD NUMBER RESPONSE]**

| | |
|---|---|
| Programmable thermostats _____ | 1 |
| Electronic thermostats +/- 0.5 degrees Celsius _____ | 2 |
| Standard manual thermostats _____ | 3 |
| Other _____ | 4 |
| Don't know | -98 |
| Refused | -99 |

**TS3a To what temperature do you set your thermostats when the rooms they control are occupied?**

| | |
|---|---|
| Degrees C_____ | |
| Degrees F _____ | |
| Don't know | -98 |
| Refused | -99 |

**TS3b To what temperature do you set your thermostats when the rooms they control are <u>not</u> occupied?**

| | |
|---|---|
| Degrees C_____ | |
| Degrees F _____ | |
| Don't know | -98 |
| Refused | -99 |

**TS3c [IF PROGRAMMABLE THERMOSTATS INSTALLED ASK TS3c. ELSE SKIP TO TS3d.] Do you use your programmable thermostats to change the temperature settings automatically?**

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Sometimes | 3 |
| Don't know | -98 |
| Refused | -99 |

**TS3d During a typical work week, how many hours per day is your home unoccupied?**

| | |
|---|---|
| # hours per day_____ | |
| Don't know | -98 |
| Refused | -99 |

**[READI IF S6=1, ELSE SKIP TO WS1]**

**Now I'd like to ask you about the thermostats you have purchased and installed since 2009.**

**TS4. How many of the following types of thermostats did you install or have installed since 2009?**

**[ENTER NUMBER, -98 FOR DON'T KNOW,- 99 FOR REFUSED]**

| | |
|---|---|
| a. Programmable thermostats | ___ |
| b. Electronic thermostats +/- 0.5 degrees Celsius | ___ |
| c. Standard manual thermostats | ___ |
| d. Other | ___ |

## PURCHASE EXPERIENCE

**TP1. Where did you purchase your thermostats?**

**[ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Contractor | 1 |
| Home improvement/hardware store (Ace, Home Depot, True Value) | 2 |
| Department Store (Target, K-Mart, Wal-Mart, Sears) | 3 |
| Big Box Retailer (Best Buy) | 4 |
| Local appliance store | 5 |
| | 6 |
| Someone else purchased | 7 |
| Internet | 8 |
| Other (specify) | 9 |
| Don't know | -98 |
| Refused | -99 |

**TP2. Who installed the thermostats?**

**[ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Member of household | 1 |
| Friend or family member outside of household | 2 |
| Contractor | 3 |
| Electrician | 4 |
| [Other] (Specify:_____) | 5 |
| [Don't know] | -98 |
| [Refused] | -99 |

## ENERGY EFFICIENCY AWARENESS

**TA1. When you were shopping for the thermostats you purchased, were you aware of energy efficient thermostats, specifically programmable thermostats and electronic thermostats that are accurate within +/- 0.5 degrees Celsius?**

| | | |
|---|---|---|
| Yes | 1 | TA2 |
| No | 2 | WS1 |
| Don't know | -98 | WS1 |
| Refused | -99 | WS1 |

**TA2. How did you learn about programmable thermostats and electronic thermostats?**
[DO NOT READ LIST. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Consumer Reports or other product-oriented magazines] | 1 | TA3 |
| Other magazines | 2 | TA3 |
| Electric utility | 3 | TA3 |
| Retailers or salesperson | 4 | TA3 |
| Contractors | 5 | TA3 |
| Friend, neighbor, relative, or co-worker | 6 | TA3 |
| Internet | 7 | TA3 |
| Newspaper | 8 | TA3 |
| Radio | 9 | TA3 |
| Television | 10 | TA3 |
| Other (RECORD) _____ | 11 | TA3 |
| Don't know/Not sure/Can't remember | -98 | TA3 |
| Refused | -99 | TA3 |

**[IF TS4a AND/OR TS4b = 0, ASK TA3. ELSE SKIP TO WS1.]**

**TA3. Why did you choose not to purchase and install either programmable thermostats or energy efficient electronic thermostats?**

| | | |
|---|---|---|
| Too expensive | 1 | WS1 |
| The dealer/ contractor didn't recommend it | 2 | WS1 |
| A consumer magazine didn't recommend it | 3 | WS1 |
| It didn't have the controls/features I was looking for | 4 | WS1 |
| It didn't have the style or color I was looking for | 5 | WS1 |
| I prefer another brand/manufacturer | 6 | WS1 |
| Wasn't in stock / Not quickly available | 7 | WS1 |
| I wasn't sure how to install them | 8 | WS1 |
| I wasn't sure how to use them | 9 | WS1 |
| The regular thermostats work fine for me | 10 | WS1 |
| Other(RECORD)_____ | 11 | WS1 |
| Don't know/ Not sure/ Can't remember | -98 | WS1 |
| Refused | -99 | WS1 |

# 6 ENERGY STAR WINDOWS

**[ASK OF ALL RESPONDENTS]**

Next, I would like to ask you a few questions about the windows n your home.

**SATURATION**

**WS1. What is the number of windows in your home? Please give me your best estimate.**
**[RECORD NUMBER RESPONSE]**

| | |
|---|---|
| Record number _____ | 1 |
| Don't know | -98 |
| Refused | -99 |

**WS2. What percentage of your windows are:**
**[READ AND RECORD PERCENTAGE RESPONSE AND ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Single pane _____ | 1 |
| Double pane _____ | 2 |
| Gas filled_____ | 3 |
| UV coated _____ | 4 |
| ENERGY STAR certified | 5 |
| Other _____ | 6 |
| Don't know | -98 |
| Refused | -99 |

**WS3. What percentage of your windows have the following types of window frames?**
**[READ AND RECORD PERCENTAGE RESPONSE AND ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Wood _____ | 1 |
| Vinyl _____ | 2 |
| Metal _____ | 3 |
| Other _____ | 5 |
| Don't know | -98 |
| Refused | -99 |

**WS4. How many windows have you purchased and installed since 2009?**

| | |
|---|---|
| Less than 5 | 1 |
| 6 | 2 |
| 7 | 3 |
| 8 | 4 |
| 9 | 5 |
| 10 | 6 |
| 11 | 7 |
| 12 | 8 |
| 12 | 9 |
| 14 | 10 |
| 15 | 11 |
| >15 | 12 |
| Don't know | -98 |
| Refused | -99 |

**WS5. What type of windows did you purchase?**
**[READ – ACCEPT MULTIPLES]**

| | |
|---|---|
| Double pane | 1 |
| Gas filled | 2 |
| UV coated | 3 |
| ENERGY STAR | 4 |
| Other | 5 |
| Don't know | -98 |
| Refused | -99 |

**PURCHASE EXPERIENCE**

**[IF S7 = 1 ASK WP1. ELSE GO TO D1]**

**WP1. Where did you purchase your windows?**
**[ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Contractor | 1 |
| Home improvement/hardware store (Ace, Home Depot, True Value) | 2 |
| Manufacturer | 3 |
| Retail store specializing in windows | 4 |
| Someone else purchased | 5 |
| Internet | 6 |

| | |
|---|---|
| Other (specify) | 7 |
| Don't know | -98 |
| Refused | -99 |

**WP2. When you were shopping for your windows, what characteristics were important to you? Anything else?**

[DO NOT READ LIST. ACCEPT MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Price/Cost | 1 | WP3 |
| Brand | 2 | WP3 |
| Energy savings | 3 | WP3 |
| ENERGY STAR Rating | 4 | WP3 |
| Appearance – match to rest of exterior | 5 | WP3 |
| Reliability/Warranty | 6 | WP3 |
| Salesperson / Contractor recommendation | 7 | WP3 |
| Consumer magazine / online recommendation | 8 | WP3 |
| Double or triple pane | 9 | WP3 |
| Type of frame – wood, vinyl, etc | 10 | WP3 |
| Other] (RECORD) _____ | 11 | WP3 |
| Don't know/Not sure/Can't remember | -98 | WA1 |
| Refused | -99 | WA1 |

[GOTO WA1 IF ANSWER TO WP2 HAS ONLY ONE ANSWER]

**WP3. Which of those characteristics was the most important one?**

| | |
|---|---|
| Price/Cost | 1 |
| Brand | 2 |
| Energy savings | 3 |
| ENERGY STAR Rating | 4 |
| Features | 5 |
| Reliability/Warranty | 6 |
| Salesperson / Contractor recommendation | 7 |
| Consumer magazine / online recommendation | 8 |
| Other] (RECORD) _____ | 9 |
| Don't know/Not sure/Can't remember | -98 |
| Refused | -99 |

**WP4. Who installed the windows?**

**[ALLOW MULTIPLE RESPONSES]**

| | |
|---|---|
| Member of household | 1 |
| Friend or family member outside of household | 2 |
| Contractor | 3 |
| Other (Specify:_____) | 4 |
| Don't know | -98 |
| Refused | -99 |

## ENERGY EFFICIENCY AWARENESS

**WA1. When you were shopping for the windows you purchased, were you aware ENERGY STAR windows?**

| | | |
|---|---|---|
| Yes | 1 | WA2 |
| No | 2 | D1 |
| Don't know | -98 | D1 |
| Refused | -99 | D1 |

**WA2. How did you learn about recommended ENERGY STAR windows?**
[DO NOT READ LIST. ALLOW MULTIPLE RESPONSES]

| | | |
|---|---|---|
| Consumer Reports or other product-oriented magazines] | 1 | WA3 |
| Other magazines | 2 | WA3 |
| Electric utility | 3 | WA3 |
| Retailers or salesperson | 4 | WA3 |
| Contractors | 5 | WA3 |
| Friend, neighbor, relative, or co-worker | 6 | WA3 |
| Internet | 7 | WA3 |
| Newspaper | 8 | WA3 |
| Radio | 9 | WA3 |
| Television | 10 | WA3 |
| Other (RECORD) _____ | 11 | WA3 |
| Don't know/Not sure/Can't remember | -98 | WA3 |
| Refused | -99 | WA3 |

**WA3. Based upon this information, did you purchase ENERGY STAR windows?**

| | | |
|---|---|---|
| Yes | 1 | D1 |
| No | 2 | WA4 |
| Don't know | -98 | WA4 |
| Refused | -99 | WA4 |

**WA4. Why did you choose not to purchase ENERGY STAR windows?**

| | | |
|---|---|---|
| Too expensive | 1 | D1 |
| The dealer/ contractor didn't recommend it | 2 | D1 |
| A consumer magazine didn't recommend it | 3 | D1 |
| I prefer another brand/manufacturer | 4 | D1 |
| Did not have the features or the color | 5 | D1 |
| Wasn't in stock / Not quickly available | 6 | D1 |
| Other(RECORD)_____ | 7 | D1 |
| Don't know/ Not sure/ Can't remember | -98 | D1 |
| Refused | -99 | D1 |

# 7 DEMOGRAPHICS

**We're almost finished. I have just a few more questions to make sure we are getting a representative sample of Newfoundland Power and Newfoundland and Labrador Hydro customers.**

**D1. Which of the following best describes your age? Would you say…**
**[READ LIST.]**

| | | |
|---|---|---|
| 1 | Less than 18 years old, | |
| 2 | 18 to 24 | |
| 3 | 25 to 34 | |
| 4 | 35 to 44 | |
| 5 | 45 to 54 | D2 |
| 6 | 55 to 64 or | |
| 7 | 65 or older | |
| -98 | [Refused] | |
| -99 | [Don't know] | |

**D2. What is the highest level of education you have completed?**
**[DO NOT READ LIST. PROMPT IF NECESSARY.]**

| | | |
|---|---|---|
| 1 | [No schooling] | |
| 2 | [Less than high school] | |
| 3 | [Some high school] | |
| 4 | [High school graduate or equivalent (e.g., GED)] | |
| 5 | [Trade or technical school] | |
| 6 | [Some college] | D3 |
| 7 | [College degree] | |
| 8 | [Some graduate school] | |
| 9 | [Graduate degree] | |
| -98 | [Refused] | |
| -99 | [Don't know] | |

**D3. What was your annual household income from all sources in 2012, before taxes? Please stop me when I reach the category that best describes your household's income. Would you say…**
**[READ LIST]**
**[IF NECESSARY: "This information is confidential and will only be used for the purpose of characterizing study respondents."]**

| | | |
|---|---|---|
| 1 | Less than $20,000 per year, | D4 |
| 2 | 20 to less than $40,000, | |
| 3 | 40 to less than $60,000, | |
| 4 | 60 to less than $80,000, | |
| 5 | 80 to less than $100,000, | |
| 6 | 100 to less than $150,000, or | |
| 7 | $150,000 or more? | |
| -98 | Refused | |
| -99 | Don't know | |

**D4. Including yourself, how many people live in your home more than nine months of the year?**

| | | |
|---|---|---|
| 1 | 1 | D5 |
| 2 | 2 | D5 |
| 3 | 3 | D5 |
| 4 | 4 | D5 |
| 5 | 5 | D5 |
| 6 | 6 | D5 |
| 7 | >6 | D5 |
| -98 | Refused | D6 |
| -99 | Don't know | D6 |

**D5. For the people living in your home more than nine months a year, how many are in each of the following age groups?**

**[READ AND RECORD RESPONSES]**

| | | |
|---|---|---|
| 1 | < 18 years old | D6 |
| 2 | 19 to 25 years old | D6 |
| 3 | 25 to 40 years old | D6 |
| 4 | 41 to 50 years old | D6 |
| 5 | 51 to 65 years old | D6 |
| 6 | >65 years old | D6 |
| -98 | Refused | D6 |
| -99 | Don't know | D6 |

**D6. What year was your home built?**

| | | |
|---|---|---|
| Record number _____ | 1 | D7 |
| Don't know | -98 | D7 |
| Refused | -99 | D7 |

**D7. What is the square footage of your home?**

| | | |
|---|---|---|
| 1 | < 1,000 square feet | D8 |
| 2 | 1,000 to 1,500 sq ft. | |
| 3 | 1,500 to 2,000 sq ft | |
| 4 | 2,000 to 2,500 sq ft | |
| 5 | 2,500 to 3,000 sq ft | |
| 6 | > 3,000 sq ft | |
| -98 | Refused | |
| -99 | Don't know | |

**D8. How many stories is your home?**

| | | |
|---|---|---|
| 1 | 1 | END_0 or 1 |
| 2 | 2 | |
| 3 | 3 | |
| 4 | >3 | |
| -98 | Refused | |
| -99 | Don't know | |

## 8 WRAP UP

**END_0.** **Okay, great. Today we're trying to reach customers who have <u>not</u> participated in any of BWL's programs, so I don't have any more questions for you today. Thank you for your time.**

**END_1.** **Those are all of the questions I have for you today. Thank you for your time.**

# *11* APPENDIX C – *takeCHARGE* Retailer Survey

# Newfoundland Power and Newfoundland & Labrador Hydro takeCHARGE Programs

**Interview Guide for:**
**Participating and Non-Participating Retailers**
**December 2013**

**Contact Name:**_____
**Company:** _____
**Street Address:** _____
**Community:**_____
**Telephone:** _____

**Interview Date:**_____ **Interview Time:** _____ **Duration of Interview:** _____

**LEAD-IN:**

**Hi, my name is _____ calling on behalf of Newfoundland Power and Newfoundland and Labrador Hydro. The Utilities are conducting a study to help improve their residential energy efficiency programs. May I please speak to someone who is familiar with your business affairs?**

[IF CORRECT PERSON, CONTINUE]

Name: _____

Title: _____

Phone: _____

[IF NOT] **Who would that person be?**

Name: _____

Title: _____

Phone: _____

[WHEN CORRECT PERSON]
**I would like to ask some questions about your recent experiences and views on sales of <<ENERGY STAR windows/insulation/thermostat> The information we gather will be kept confidential and will not be associated with you or your business in any way.**

[IF THEY ASK] **The conversation will take about 15 minutes.**

# Newfoundland Power and Newfoundland & Labrador Hydro takeCHARGE Programs

## Interview Guide for:
## Participating and Non-Participating Contractors / Builders
## 12/05/2013

**Introduction**

My name is _____from Dunsky Energy Consulting, calling on behalf of Newfoundland Power & Newfoundland and Labrador Hydro. THIS IS NOT A SALES CALL. We are doing a brief survey with contractors and builders as part of a third-party evaluation of the takeCHARGE Programs.

Please note that a $50 VISA gift card will be mailed to you as compensation for your time.

First I would like to briefly provide you with some information on the interview process.

The interview should take about 15 minutes. If you don't have any objection, I will be recording our conversation so that I can be sure not to miss anything in my written report.

Our report will contain anonymous comments from approximately 20 participating and non-participating contractors and builders. I want to assure you that nowhere in the report or in any other communications will we specifically mention your name or the name of your organization.

**General Information**

I'd like to start by asking some questions about your company. This series of questions will help us the market's baseline and the programs' impacts.

1. According to our list, your company's primary area of expertise is _____? Can you confirm this information? Are there any other areas you're involved in? [*Probe for insulation, thermostats, windows, new construction, remodeling of existing homes]*

2. [*For each relevant area of expertise*] How many projects involving [*SERVICE*] did you complete in the past two years? [*2012 and 2013*]

3. [FOR NEW HOMES]
    a. In what communities did you build new homes in 2012 and 2013?
    b. What portion of the new homes you built in 2012 and 2013 had the following features:
        - Electric heat
        - Attic insulation [Attics: min R32 to max R40]
        - Basement insulation [Basement walls: min R12 to max R20]
        - Energy Star windows
        - Programmable thermostats
        - Electronic thermostats that are not programmable

4. [FOR REMODELING PROJECTS]
    a. In what communities did you remodel homes in 2012 and 2013?
    b. What portion of the remodeling projects in 2012 and 2013 had the following features:
        - Electric heat
        - Attic insulation [Attics: min R32 to max R40]
        - Basement insulation [Basement walls: min R12 to max R20]
        - Energy Star windows
        - Programmable thermostats
        - Electronic thermostats that are not programmable

5. [FOR INSULATION]
    a. What portion of the insulation projects you completed was in existing homes versus new homes?
    b. What portion of the insulation projects you completed in 2012 and 2013 met program requirements? [Describe requirements]
    c. [probe for new homes versus existing homes if applicable]
    d. In the past three years, what was the portion that:
        i. Went up? By how much?
        ii. Went down? By how much
        iii. Stayed the same
    e. [if 5d response = went up] How important was the takeCHARGE program in affecting the increase? Why do you say that?

6. [FOR WINDOW PROJECTS]
    a. What portion of the window installation projects you completed was in existing homes versus new homes?
    b. What portion of the window installation projects you completed in 2012 and 2013 used Energy Star windows?

c. [probe for new homes versus existing homes if applicable]

7. [FOR THERMOSTATS – REPEAT QUESTIONS FOR PROGRAMMABLE THERMOSTATS AND ELECTRONIC THERMOSTATS]
    a. What portion of the thermostat installations you completed was in existing homes versus new homes?
    b. What portion of the thermostats you installed in 2012 and 2013 met program requirements? [programmable thermostats or electronic thermostats with a temperature rating of +/- 0.5 degrees Celsius are eligible for the rebate]
    c. [probe for new homes versus existing homes if applicable]

8. How many employees, including yourself, does your company have? *[Probe for Full-time/Part-time]*

9. Did your firm participate in the takeCHARGE programs *[Briefly explain programs if required]*?

    a. YES: Go to PARTICIPATING CONTRACTOR section
    b. NO: Go to NON-PARTICIPATING CONTRACTOR section

## PARTICIPATING CONTRACTOR SECTION

**Barriers**

1. How aware, would you say, are your customers of the takeCHARGE Programs? *[Probe: What share already knows about the program before you tell them about it?]* How interested are they in the program? Does awareness or interest vary by any customer characteristics (e.g., municipality, economic status)?

2. How frequently do you promote the program to your customers?

    a. For all relevant projects? Why?
    b. For most projects? Why?
    c. For some projects? Why?
    d. For no projects? Why?

3. How easy or difficult is it for you to sell the program to customers? Why?

**[We are seeking information on market barriers to participation due to program features (product/service availability, rebate level, application form, etc.)**

4. What are the key barriers to your customers' purchase of basement/attic insulation; programmable or electronic thermostats; ENERGY STAR window? *[Probe for barriers by product type if relevant]* What could be done to overcome these barriers? How are the Programs addressing those barriers right now?

5. Could you suggest any changes to program processes or requirements that would make it easier for you and your customers to participate?

**Marketing and Communication**

6. What marketing channels used by the Program are you aware of? In your opinion, are the marketing efforts appropriate? What works/doesn't work with customers? Why?

7. Does your organization use the takeCHARGE Program as a tool for your own marketing efforts? If so, how? What, if any, materials or support does the utilities provide your firm? Are there any additional materials that would be useful to you?

8. In your view, are there gaps or underserved market segments that could present an opportunity for the measures being promoted? [*Probe which segments and why*]

**Program's Influence**

I now have a few questions about how the takeCHARGE Programs might have affected the market for home energy retrofits and new construction in Newfoundland & Labrador.

9. In your opinion, what changes have the takeCHARGE Programs brought to the residential retrofit and new construction markets? *[Probe to get details on insulation, thermostats, windows, new construction, remodeling]*
   a. Have the Programs helped lead to changes in the demand for energy efficiency measures, or increased contractor activity, in the past four years?
   b. Have the Programs helped promote energy efficiency measures that wouldn't otherwise have been realised? Please explain.
   c.
   d. How did the change in the building code affect the adoption of the qualifying equipment for new construction? For major remodeling?
   e. What trends do you see in the coming years regarding the installation of qualifying equipment in your market?
   f. What role does energy efficiency play in your marketing strategy and business practice? What is the value for you of promoting energy efficiency measures?

10. As a result of the takeCHARGE Programs…
    a. have you changed the type of services you provide or the type of equipment you install?
    b. have you changed any other business practices as a result of the program? [Probe for: hired more staff, opened up new offices, changed marketing, etc.]
    c. have you experienced an increase in your business?

**Satisfaction**

11. Generally speaking, what is your experience so far with the takeCHARGE Programs? What are the key strengths? What could be improved on?

12. How satisfied are you with your participation in the program as a contractor? Please explain.

13. How satisfied do you think your customers are with their participation in the program? Please explain.

14. Are there any other comments you have or recommendations you would like to make for improving the program?

***The interview is now completed. I want to thank you very much for your time in helping improve the takeCHARGE program in the future.***

# NON-PARTICIPATING CONTRACTOR SECTION

**Program Awareness and Barriers**

1. Are you aware of the takeCHARGE programs? *[Probe to what extent they are aware of them. Have they heard of them, do they know the programs details, etc. Ask how they heard about the programs.]*

2. How aware, would you say, are your customers of the takeCHARGE Program?

[Ask only if contractor is aware of the takeCHARGE programs]

3. Do you promote the program to your customers? (Always, most of the time, sometimes, rarely, never?) Why?

4. How easy or difficult is it for you to sell the program to customers? Why?

5. What would be the main barriers/reasons for not participating in the programs?
    a. For you?
    b. For your customers?

6. What changes could be made to the program to make it more interesting to you? To your customers?

**Program's Influence**

I now have a few questions about how the takeCHARGE Program might have affected the market for home energy retrofits and new construction in Newfoundland & Labrador.

7. In your opinion, what changes have the takeCHARGE Programs brought to the residential retrofit and new construction markets? *[Probe to get details on insulation, thermostats, windows, new construction, remodeling]*
    g. Have the Programs helped lead to changes in the demand for energy efficiency measures, or increased contractor activity, in the past two years?
    h. Have the Programs helped promote energy efficiency measures that wouldn't otherwise have been realised? Please explain.

i. How did the change in the building code affect the adoption of the qualifying equipment for new construction? For major remodeling?
j. What trends do you see in the coming years regarding the installation of qualifying equipment in your market?
k. What role does energy efficiency play in your marketing strategy and business practice? What is the value for you of promoting energy efficiency measures?

***The interview is now completed. I want to thank you very much for your time in helping improve the takeCHARGE program in the future.***

## SC. SCREENING

**PARTICIPATING RETAILERS**

**SC1. According to our records, your business has sold <ENERGY STAR windows/insulation/thermostat> between now and 2009. Can you confirm this information?**

Yes..... 1
No..... 2
[CONTINUE SURVEY. TREAT RESPONDENT AS NONPARTICIPANT]
[DON'T KNOW] ..... -97[T&T1]
[REFUSED] ..... -98[T&T1]

**[T&T1. THANK & TERMINATE SCRIPT]**

**"I'm sorry, but we've been asked to interview contractors or distributors that have sold ENERGY STAR windows, energy efficient insulation, or programmable or high performance electronic thermostats in the Newfoundland Power and Newfoundland and Labrador Hydro service areas between now and 2009. Thank you for your time."**

**NON-PARTICIPATING RETAILERS**

**SC2. [FOR INTERVIEWEES FROM THE "NONPARTICIPANT SAMPLE FRAME"]**
**Have you ever have worked with representatives for the takeCHARGE Programs?**

## GCI. GENERAL COMPANY INFORMATION

**Next, I'd like to ask for some general information about your business's operations at this location.**

**GCI1. First, what is your job title?**

**GCI2. About how many full-time employees does your business employ at your location?**

**GCI3. Does your business operate at other locations in Newfoundland and Labrador? How many others?**

**GCI3A. You mentioned your business has multiple locations in Newfoundland and Labrador. Do these locations act independently in terms of their sales decisions or are sales decisions made at a higher or corporate level?**

**GCI4. Of the following, which best describes your business?**

**GCI4a. Which days of week and times of day are your busiest?**

**GCI5. Which of the following products does your business sell from this location?**

**GCI6. I noticed you said your business doesn't sell Energy Star Products. Why not?**

## EE. SALES OF ENERGY EFFICIENT PRODUCTS

**Now I'm going to ask you some questions about some of the energy efficient products you sell.**

**WINDOWS**

**EEW1. What percentage of your sales are to:**

| |
|---|
| Contractors _____% |
| Do-It-Yourself Homeowners _____% |

**EEW2. Has the market share of sales to contractors increased/decrease/stayed the same since 2009? Why?**

**EEW3. Has the market share of sales to DIY homeowners increased/decrease/stayed the same since 2009? Why?**

**EEW4. What percentage of the windows your business sells are:**

| |
|---|
| Single pane _____% |
| Double pane _____% |
| Gas filled_____% |
| UV coated _____% |
| ENERGY STAR certified _____% |

**EEW5.**

**EEW6. Do you consider ENERGY STAR windows to be a good value for your residential customers?**

**EEW7. Why do you say that?**

**EEW8. What are reasons, if any, your residential customers do not purchase ENERGY STAR windows?**

**EEW9. Do these sales seem likely to continue based on your understanding of the current market?**

**EEW9a. Why do you say that?**

**INSULATION**

**EEI1. What percentage of your sales are to:**

| |
|---|
| Contractors _____% |
| Do-It-Yourself Homeowners _____% |

**EEI2. Has the market share of sales to contractors increased/decrease/stayed the same since 2009? Why?**

**EEI3. Has the market share of sales to DIY homeowners increased/decrease/stayed the same since 2009? Why?**

**EEI4. Which of the following types of residential insulation for basements and attics does your business sell?**

| |
|---|
| Blanket – batt or roll |
| Foam board insulation |
| Loose fill insulation |
| Spray foam insulation |
| Other (Specify) |

**EEI5. What is the percentage of insulation does your business sells for the following R-values?**

| |
|---|
| Less than R-12 _____% |
| R-12 _____% |
| R-12 to R-20 _____% |
| R-20 _____% |
| R-20 to R-25 _____% |
| R-25 or more _____% |

**EEI6. Do you consider basement insulation > R20 and attic insulation > R32 to be a good value for your residential customers?**

**EEI6a. Why do you say that?**

**EEI7. Do customers ask advice regarding type of and level of insulation?**

**EEI4. What are reasons, if any, your residential customers do not purchase basement insulation > R20 and attic insulation > R32?**

**EEI7. Do these sales trends seem likely to continue based on your understanding of the current market?**

**EEI7a. Why do you say that?**

**<u>THERMOSTATS</u>**

**EET1. What percentage of your sales are to:**

| |
|---|
| Contractors _____% |
| Do-It-Yourself Homeowners _____% |

**EET2. Has the market share of sales to contractors increased/decrease/stayed the same since 2009? Why?**

**EET3. Has the market share of sales to DIY homeowners increased/decrease/stayed the same since 2009? Why?**

**EET1. What percentage of the residential thermostats your business sells are:**

| |
|---|
| Programmable thermostats _____% |
| Electronic thermostats +/- 0.5 degrees Celsius _____% |
| Standard manual thermostats _____% |
| Other (Specify) _____% |

**EET2. Do you consider programmable thermostats or energy efficient electronic thermostats to be a good value for your residential customers?**

**EET2a. Why do you say that?**

**EET3.** **What are reasons, if any, your residential customers do not purchase either programmable thermostats or energy efficient electronic thermostats?**

**EET6.** **Do these sales trends seem likely to continue based on your understanding of the current market?**

**EET6a.** **Why do you say that?**

## PA. PROGRAM AWARENESS

NON-PARTICIPANTS

**PA1. Are you aware of the takeCHARGE program sponsored by Newfoundland Power and Newfoundland and Labrador Hydro utilities?**

**PA2. Do you know what types of <Windows/basement and attic insulation/thermostat> equipment this program rebates?**

**PA2A. Which types?**

**PA3. Do you know what rebate levels the takeCHARGE program offers for this energy-efficient product?**

**PA4A. What levels?**

**[ASK IF PARTICIPANT AND NON-PARTICIPANT WHO IS AWARE OF PROGRAMS]**

**PA5. How did you hear about the takeCHARGE program?**

## EEM. ENERGY EFFICIENT MARKETING

**Now I'm going to ask you some questions about your experience with marketing and sales practices.**

**EEM1: How does your business advertise its services?**

**EEM2. Is energy efficiency featured in any of these advertisements?**

**a.** [IF YES] **How so?** [IF NO] **Why not?**

**EEM3. Since 2009, does your business more frequently/less frequently/about the same recommend high efficiency ENERGY STAR windows, energy efficient insulation, and programmable and high performance electronic thermostats?**

| EE Measure | EEM3. Recommend more/less/same frequently since 2009? Yes/No | EEM3a. Why is that? |
|---|---|---|
| Energy Star Windows | | |
| Insulation | | |
| Programmable and high performance electronic thermostats | | |

**[ASK IF PARTICIPANT OR NON-PARTICIPANT WHO IS AWARE OF THE PROGRAM]**

**EEM4. Have you received any marketing support through the program?**

**EEM5. What marketing support have you received?**

**EEM6. On a scale of 1 to 5, where 5 is "Very Effective" and 1is "Not at all Effective," how effective do you think the takeCHARGE program has been in encouraging retailers to sell more efficient <ENERGY STAR windows/insulation/thermostat> for residential applications?**

**EEM7. Why do you say that?**

**EEM9. What business advantages do you perceive in promoting energy efficient <ENERGY STAR windows/insulation/thermostat> technologies in residential applications?**

**EEM10. What disadvantages, if any, do you see in promoting energy efficient <ENERGY STAR windows/insulation/thermostat> equipment?**

**EEM11.**[Skip if Non-Participant] **Has your business helped contractors participate in the takeCHARGE program?**

## PS. PROGRAM SATISFACTION [ASK ONLY IF PROGRAM PARTICIPANT]

**Next I have some questions about how satisfied you are with different aspects of the takeCHARGE Program.**

**PS1. On a scale of 1 to 5 where 10 means 'Very Satisfied' and 1 means 'Very Dissatisfied': Regarding the you sell, How satisfied are you with the marketing support provided by the takeCHARGE program?**

**PS1B. Why do you say that?**

**PS2. How satisfied have you been with the takeCHARGE program as a whole, considering all the things we talked about?**

**PS3. What aspects of the takeCHARGE program have you found work well, or are helpful?**

**PS4. What aspects of the takeCHARGE program would you change/improve upon if you could?**

**[T&T2. THANK AND TERMINATE]**
**Those are all the questions I wanted to ask. Thanks again for your participation.**

# 12 APPENDIX D – *takeCHARGE* Contractor Survey

## About DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping our customers make the world safer, smarter and greener.