2010 COOL SAVINGS REBATE Program Evaluation
2010 COOL SAVINGS REBATE Program Evaluation
Contents

Executive summary ....................................................................................................................................................... V
  Purpose ................................................................................................................................................................. v
  Scope and method ................................................................................................................................................... v
  Premises and postulates ..................................................................................................................................... vi
  Status of data ....................................................................................................................................................... vi
  Findings ............................................................................................................................................................... vii
  Conclusions and recommendations .................................................................................................................... viii

Introduction ................................................................................................................................................................. 1
  Program description ................................................................................................................................................ 1
  Evaluation objectives ........................................................................................................................................... 1
  Data collection methodology ............................................................................................................................... 1
  Statistical confidence ........................................................................................................................................... 6

Program impacts ............................................................................................................................................................ 7
  ENERGY STAR® CAC prescriptive savings ........................................................................................................ 7
  ECM furnace prescriptive savings ....................................................................................................................... 8
  Programmable thermostat prescriptive savings .................................................................................................. 11
  ENERGY STAR® CAC savings allocation ........................................................................................................... 12
  ECM furnace savings allocation .......................................................................................................................... 13
  Programmable thermostat savings allocation ..................................................................................................... 15
  2010 CSRP gross energy savings ....................................................................................................................... 15
  2010 CSRP net-to-gross ratio determination ..................................................................................................... 19
  2010 CSRP net energy savings .......................................................................................................................... 22
  2011 forecasts ..................................................................................................................................................... 23

Market characterization ................................................................................................................................................. 27
  Participation in other incentive programs ........................................................................................................... 27
  Market trends ....................................................................................................................................................... 34
  Effectiveness of marketing efforts ...................................................................................................................... 49
  Driving measure for participants installing more than one measure .................................................................. 53

Conclusions ................................................................................................................................................................. 56

Appendix A. Environics report on surveys conducted .............................................................................................. 57
Appendix B. Participant and contractor surveys ...................................................................................................... 58
Executive summary

Purpose

The CSRP, managed by the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI), is a province-wide electricity efficiency and conservation program for residential consumers and businesses with residential-type heating and cooling systems with existing central space heating and/or space cooling systems. The program is designed to increase the market penetration of highly efficient HVAC equipment. To encourage the purchase of efficient equipment, the program offers incentives for the purchase of ENERGY STAR® qualified central air conditioning (CAC) systems, furnaces with electronically commutated motors (ECMs), and programmable thermostats.

This report evaluates the impact and effectiveness of the Ontario Power Authority’s 2010 COOL SAVINGS REBATE Program (CSRP). Specifically, the goals and objectives of the 2010 CSRP evaluation are to:

• Tabulate an estimate of the gross and net energy savings and peak demand reductions achieved through the program.
• Assist in understanding the market for the measures supported through the CSRP by considering: changing program participation levels, market trends, the effectiveness of marketing efforts and projected changes in participation rates.

Scope and method

The analysis was conducted for eligible furnace and CAC products. Analysis relating to the programmable thermostats was not required. Five primary areas of inquiry are:

1 Participation levels and resulting energy savings and demand reductions
2 Impacts of other incentive programs
3 Specification and operation of replacement equipment
4 Drivers of participation and impact of those on future program participation
5 Effectiveness of OPA marketing initiatives.

Gross and net energy savings and peak demand reductions were estimated based on the number of installations of each equipment type, and behavioural patterns before and after the new installations. These were combined with information on energy savings associated with each technology type. Net energy savings accounted for free riders (people who would have taken the same actions in the absence of the program), and spillover (energy savings that resulted indirectly from the program). All these relate to the first area of inquiry.

The other four areas are aspects of the understanding of the market.
Findings were derived primarily by analysing the results of e-mail surveys of program participants and participating contractors, interviews with furnace and air conditioner manufacturers, and a review of available literature, including evaluations of the program in prior years, and Statistics Canada data on household equipment and facilities.

**Premises and postulates**

OPA provided information including: the database of participants, the list of contractors, and evaluations from previous years which included various types of data, including net to gross ratios, and the impacts of the end of the federal ecoENERGY and Ontario Home Energy Savings Programs on the CSRP. Although some checking of the internal consistency of these was undertaken, our premise was that these information sources were basically reliable and complete.

Our postulate was that a web-based survey of participants and contractors would provide a sample of responses that were representative of the overall groups they were a part of. We also assumed that program uptake and free-rider rates are sensitive to the level of the incentive.

**Status of data**

Major sources of data for the evaluation were the participant database, survey of participants and contractors, interviews with furnace manufacturers, previous year evaluations, and the OPA’s *Prescriptive Measures and Assumptions* document.

The participant database suggested some improvement in how contractors completed the application forms over previous years; every participant who completed both a furnace and CAC replacement had his or her system AHRI matched. The installation date for a significant percentage of the records was not deemed reliable, as there were a disproportionate number of records in January. The application form/database does not include household characteristics, and some of this information was therefore sought through the participant survey.

The survey of participants and contractors sought information on equipment sizing and operation, participation in other programs and market information, and the influence of other factors and programs. In addition, participants were asked about their attitudes towards energy efficiency, and to self-report free ridership and spillover. Contractors were asked about 2010 business and market trends, and their participation in the CSRP program. In most cases, survey participants were provided with multiple-choice responses. There are inherent limitations to the accuracy of responses that can be expected, particularly given that some of the questions are about decisions or actions that occurred six or more months ago. The sample size is sufficiently large to give expectations that it is representative. The total number of 2010 program participants was 69,591. A total of
1158 participant surveys were completed. The margin of sampling error for a sample of this size is plus or minus 2.7 percentage points, 19 times in 20. The total number of 2010 HVAC contractors who received invitations to participate was 12,289. A total of 177 surveys were completed. The margin of sampling error for a sample of this size is plus or minus 6.7 percentage points, 19 times in 20.

Some data taken from previous years’ evaluations appear to be assumptions that have not been tested, for example, the number of people who would have raised their thermostat setting in the absence of the program. Similarly, program uptake in the absence of the federal and provincial programs is based on assumptions about how energy users are likely to respond.

For the impact evaluation we have used values from the OPA 2010 Prescriptive Measures and Assumptions document. This document gives ‘typical’ values, but actual values are likely to vary significantly from these typical values.

Finally, there are very limited data available on overall stocks of equipment (by vintage), and on actual sales of equipment by type.

**Findings**

Participation in the program in 2010 reached 103% of the participant target and 130% of the energy and summer peak demand savings targets, even though participant numbers were down slightly from 2009 levels. Reasons cited by survey participants for the lower participant numbers included the partial sunsetting of the ecoENERGY and OHESP programs.

The other major incentive programs that impact on the participation rate in the CSRP are the ecoENERGY and OHESP programs. Gas companies offered no incentives in 2010 for eligible CSRP equipment, and there are not plans to offer them in the future. Manufacturers offer some rebates but these are not always based on the energy efficiency of the equipment, and are not seen by program participants as a major factor driving their decisions on equipment replacement.

A significant number of contractors (25%) indicated they did not use a heat-loss model to size equipment, and an even larger percentage did not rely completely on heat-loss calculations to size replacement equipment. In addition, manufacturers indicated that they were recommending fan settings that did not minimize electricity use. Participants reported a higher use of the ‘automatic’ setting for furnace fans than in previous years, resulting in significant energy savings.

The age of the equipment is the primary driver for furnace replacement. The high cost of replacing CACs and furnaces deter homeowners from replacing the equipment before at least eight years of operation for existing furnaces, and the entire expected lifetime of existing CACs.

There was a notable spike in program uptake in June, after the OPA marketing blitz of radio and newspaper ads in May. Still,
approximately 65% of participants heard of the program through a contractor and 31% were influenced by a contractor when purchasing a new ECM furnace or ENERGY STAR® CAC.

Conclusions and recommendations

The program has exceeded its participant and savings targets. The disproportionate increase in savings is the result in a net shift in furnace fan operation (from continuous or ‘always on’ to non-continuous or ‘auto’ modes). The decrease in participant levels appears to reflect the partial sunsetting of the ecoENERGY program, and is not an indication of market saturation.

The partial return of the ecoENERGY program (from June 6, 2011 to March 31, 2012) can be expected to have a positive influence on participation in the program in 2011, largely due to the large rebate offered. Manufacturer and contractor incentives do not appear to have a significant influence on HVAC purchasing decisions, and may be perceived as price breaks, rather than true rebates. As different programs are offered/not offered, the overall incentive available to participants will change, thus affecting CSRP participation.

 Contractors are key partners in the programs, and they have a significant influence on energy savings associated with the program through proper equipment specification and advice on operating procedures. Further, proper completion of the application forms allows for more accurate estimates of the impacts of the program. Additional efforts may be justified to ensure contractors complete application forms properly, use heat-loss models to size equipment, and give customers information on how to operate their equipment to reduce energy use. These efforts might include a stronger insistence on use of heat-loss models, contractor training programs, and redesign of application forms to facilitate proper completion (e.g. by defaulting the installation date to the current date, rather than leaving it blank).

The CSRP program is not likely to saturate the market for ENERGY STAR® CACs or ECM furnaces in the foreseeable future. The long lifetime of this equipment means that there is a large installed stock to be replaced, and the age of the equipment is the primary driver of participants’ decision to replace it. It is not in the participant’s interest to replace most furnaces before eight years of operation, and most CACs before the end of their life. This might be reflected in marketing materials. Most program participants will be ‘new’ participants, and replacement decisions will be largely independent of what equipment is being replaced. To the extent that the program is able to accelerate the turnover of stock, it is likely to increase (not decrease) the number of participants, by reducing the average equipment lifetime. Thus the focus of the program should be on market penetration, not saturation.

Mass marketing of the program has been and can be effective in drawing participants into the program, but given the relatively small proportion of customers who will be replacing equipment, and the role that contractors play in the purchase decision, a key marketing avenue will continue to be the contractors, and ensuring that they
are partners in delivering the program and bringing it to the attention of customers.

When examining the participants that installed both an ENERGY STAR® CAC and an ECM furnace, it was found that 51% of participants who installed both measures were driven by an ECM furnace install and 49% of participants were driven by an ENERGY STAR® CAC install.
Introduction

This report evaluates the impact and effectiveness of the Ontario Power Authority’s 2010 COOL SAVINGS REBATE Program (CSRP).

Program description

The CSRP, managed by the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI), is a province-wide electricity efficiency and conservation program for residential consumers and businesses with residential-type heating and cooling systems with existing central space heating and/or space cooling systems. The program is designed to increase the market penetration of highly efficient HVAC equipment. To encourage the purchase of efficient equipment, the program offers incentives for the purchase of ENERGY STAR® qualified central air conditioning (CAC) systems, furnaces with electronically commutated motors (ECMs), and programmable thermostats. The incentives offered in 2010 were as follows:

- $250 for the purchase of an ENERGY STAR® qualified (14.5 SEER, 12.0 EER (or above) CAC system;
- $400 for the purchase of an ENERGY STAR® qualified (15+ SEER, 12.5 EER (or above) CAC system;
- $125 for the purchase of a furnace or air handler equipped with an ECM; and
- $25 for the purchase, installation, and set-up (by a program-registered contractor) of a programmable thermostat for use with central air conditioning and central heating system.

Evaluation objectives

The goals and objectives of the 2010 CSRP evaluation are to:

- Assist in understanding the market for the measures supported through the CSRP by considering: changing program participation levels, market trends, the effectiveness of marketing efforts and projected changes in participation rates; and
- Tabulate an estimate of the gross and net energy savings and peak demand reductions achieved through the program.

The analysis was conducted for eligible furnace and CAC products. Analysis relating to the programmable thermostats was not required.

Data collection methodology

Online surveys of participants and HVAC contractors represent the primary sources of data. Information was also collected through telephone consultation with manufacturers of air conditioners and furnaces and from a 2009 survey of HVAC contractors undertaken by
the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI). Additional information required for the impact evaluation came from evaluations conducted in previous years, and from the Ontario Power Authority’s 2011 Prescriptive Measures and Assumptions List.

**Participant surveys**

An email with a link to the online survey was sent to all 2010 CSRP participants who provided an email address. One reminder email was sent to the unresponsive participants. A total of 1158 surveys were completed. Additional detail on the methodology and results are presented in the survey report from Environics included as Appendix A. The participant and contractor survey questions are included as Appendix B.

The majority of online survey questions asked participants to choose among multiple options (including yes/no questions). For most multiple choice questions, respondents were able to select “don’t know,” “have not decided,” “don’t recall,” “other,” etc. These options were included to avoid spurious selections. A limited number of questions asked respondents to type in numerical values.

The sections below provide an overview of the types of questions and topics included in the participant survey. These descriptions are not comprehensive; please consult Appendix B for the full list of questions.

Although a comparison of results from the 2009 telephone participant survey and the 2010 online survey indicate consistent data for the most part, different surveying methods may lead to slight differences in how participants respond to questions.

**Equipment size and operation**

Participants were asked to type in a numerical value for the size of their new equipment (in BTUs). Participants also identified the equipment being replaced from a list of 4 possible options for air conditioning and 8 possible options for furnace systems.

Participants were asked to select among multiple choices to determine if and how they have changed the temperature settings in their house with the new equipment. Those who indicated that they have changed settings were asked to type in the number of degrees lower/higher they set their thermostat (in Celsius or Fahrenheit).

For furnaces, participants were asked to select the fan settings they use with their new equipment in the winter and in the summer. Explanations were provided where needed to assist participants; for example, options included “On (fan blows at all times)”, and “Auto (fan blows intermittently)”. They were also asked to indicate the summer fan settings recommended by their contractor.
Participation in other programs and marketing information

To gather information on participation in other programs, respondents were asked to select all of the programs in which they participated from a list of the 6 to 7 options. Participants were asked to type in the value of rebates received from other programs (in dollars). They were also asked to rate the influence of the various programs in which they participated, as described below.

To explore the effectiveness of different types of marketing information, respondents were asked to select all of the sources through which they heard that they could get a Cool Savings Rebate for the equipment in question, from a list of six.

Influence of other factors and programs

To assess levels of influence of various factors in decision-making, participants were asked to “indicate the extent to which each of the following factors affected their decision to purchase” the equipment in question. Response choices for each factor were: “Strongly influenced,” “Somewhat influenced,” “Weakly influenced,” and “Not influenced at all,” as well as “Cannot say.” Questions addressed the various rebate programs as well as a number of other factors (11 in total for air conditioners, and 14 for furnaces). The list of factors was randomized to remove any biases related to ordering of questions. Only participants who had indicated their participation in other programs were asked to rate the influence of these programs. Later in the survey, participants were asked to select the most influential factor among those that had “strongly influenced” them (as previously indicated).

Energy conservation attitudes, self-reported free ridership and spillover

To assess past attitudes related to energy conservation and efficiency, participants were asked to rate the frequency with which they spent more money for energy efficient products, and the importance of energy conservation to them, both on five-point scales.

Multiple choice questions were also used to inform the analysis of spillover effects of the CSRP. Respondents were asked to self-report any general change in their effort level to learn about opportunities to improve residential energy efficiency and were also asked to select the specific actions that they have taken from a list of six plus “other.”

Respondents were asked to choose among five options to describe what they would have done if the CSRP program had not been available: “made the same purchase,” “waited to make the same purchase at a later date,” “purchased a less expensive furnace (or air conditioner)”, “not replaced the existing equipment,” or “other” (please specify).
**HVAC contractor surveys**

An email with a link to the online survey was sent to all HVAC contractors who provided an email address. One reminder email was sent to the unresponsive participants, and one was sent to contractors who started but did not complete the survey. A total of 177 contractors completed the survey. The list of contractor survey questions is included in Appendix B.

The majority of online survey questions asked contractors to choose among multiple options (including yes/no questions). For most multiple choice questions, respondents were able to select “don’t know,” “have not decided,” “don’t recall,” “other,” etc. These options were included to avoid spurious selections. A limited number of questions asked respondents to type in numerical values and written answers. A limited number of questions asked contractors to rank scenarios based on how commonly they occur.

The sections below provide an overview of the types of questions and topics included in the contractor survey. These descriptions are not comprehensive; readers should consult Appendix B for the full list of questions.

**Equipment size and operation**

Contractors typed in a number from 0 to 100% to indicate the percentage of time that they installed a furnace with lower capacity than the existing system. Contractors identified all of the methods that they used to determine appropriate equipment sizing, from a list of four methods (plus “other”). They also selected whether or not they changed their furnace sizing methods to participate in the CSRP program. Contractors identified the advice that they give customers who purchase ECM furnaces regarding summer and wintertime settings from a list of six options (not mutually exclusive).

**Participation in other programs and marketing information**

Contractors identified how often their customers received incentives from each of the five program options, on a five-point scale from “usually” to “never”. They were also asked about their customers’ familiarity with the CSRP, and with other non-CSRP incentives on a four-point scale from “very familiar” to “not at all familiar”. Finally, contractors were asked whether or not and to whom they aggressively promote the CSRP program.

**Influence of other factors and programs**

Contractors were asked a number of questions about their customers’ decisions to purchase the equipment in question and to participate in the rebate program. They were asked to rank a number of scenarios from 1 (“least common”) to 5 (“most common”) that described whether
customers were already influenced by CSRP rebates and non-CSRP rebates, and/or whether these two types of rebates may have changed customers’ decisions. They were also asked to select their customers’ primary motivators from a list of five options. Finally, they were asked to select the strongest motivator among those they originally identified.

**2010 business and market trends**

Contractors typed in numerical values for the total number of residential-type furnaces / central air conditioners (CACs) that they installed in residences and in businesses in 2010. They then typed in the number of these installations that were ECM furnaces / ENERGY STAR® qualified CACs. They selected whether they installed more units, fewer units or the same number of units in 2010 as in 2009, and whether the proportion of CSRP-eligible equipment has “increased,” “remained about the same,” or “decreased” over that time period. They were asked to predict changes in demand for furnace / CAC replacements in 2011 on a five-point scale from “large increase” to “large decrease”.

Contractors further specified the percentage of their installations that are replacements, new installations in existing homes, and new constructions. They identified the percentage of service calls that lead to repair and replacement for furnaces and AC systems that are over 10 years in age. Finally, they were asked to type in the percentage of CSRP-eligible customers that actually applied for the rebate.

**Contractors’ participation in the CSRP**

Contractors typed in the number of years that they have been installing HVAC equipment and selected the first year of their participation in the CSRP. They also specified whether or not they have seen an increase in sales as a direct result of their participation in the CSRP. They rated their satisfaction with the CSRP on a four-point scale from “very satisfied” to “very dissatisfied”.

**HVAC manufacturer surveys**

IndEco assessed the 2010 CSRP participant database to determine the manufacturers with the greatest number of installed furnaces and CACs. The top manufacturers for both furnaces and CACs were Carrier, Goodman, Lennox, Rheem, Trane, and York. Telephone surveys were conducted with all six of the manufacturers.

Manufacturers were asked open-ended questions about market trends in ECM furnaces and ENERGY STAR® CACs. Questions addressed the following: percentage of manufacturers’ 2010 furnace / CAC sales that were ECM furnaces / ENERGY STAR® CACs, changes in sales of these products over the last few years, predicted market share of these products over the next five years, and predicted changes in prices of
these products relative to other furnaces and CACs. They were also asked to discuss the factors that drive sales of high-efficiency furnaces / CACs and that impact their market share, including the impact of the CSRP and similar programs. Finally, they were asked to describe the rebates that they offer for ECM furnaces and ENERGY STAR® CACs.

Gas utility surveys

Enbridge Gas Distribution and Union Gas were contacted by email and by telephone. IndEco spoke with Ms. Judith Ramsay, Manager of DSM Research and Evaluation at Enbridge, and Ms. Leslie Colforter, Senior Program Evaluator in the DSM Strategy Evaluation Department at Union Gas. They were asked about their utilities’ 2010 high-efficiency furnace incentive programs and planned future programs.

Statistical confidence

The total number of 2010 program participants was 69,591. A total of 1158 participant surveys were completed. The margin of sampling error for a sample of this size is plus or minus 2.7 percentage points, 19 times in 20.

The total number of 2010 HVAC contractors who received invitations to participate was 12,289. A total of 177 surveys were completed. The margin of sampling error for a sample of this size is plus or minus 6.7 percentage points, 19 times in 20.
Program impacts

The impacts of the 2010 CSRP were calculated by applying prescriptive unit energy, demand and natural gas savings to the number of rebated ECM furnaces, ENERGY STAR® CACs and programmable thermostats. Impacts for each type of rebated equipment were also influenced by other factors, such as the specific usage of the type of equipment, participant behaviour and house characteristics.

A net-to-gross ratio was applied to gross impacts in order to determine the net impacts of the program. The impact section of this report details the prescriptive savings values used to calculate impacts, describes the methods used to appropriately apply these prescriptive values to the participant data, and discusses the net-to-gross ratio used.

**ENERGY STAR® CAC prescriptive savings**

Prescriptive savings for ENERGY STAR® CACs are provided in Table 1. These savings are a result of an assessment of the average unit savings for ENERGY STAR® CACs performed by Frontier Associates in the 2009 CSRP evaluation. Of note is the category for a high temperature setting. This category is used for those participants that have set the thermostat on their new ENERGY STAR® CAC up 2 degrees Celsius warmer than they would have had they not installed a new ENERGY STAR® CAC as part of the 2010 CSRP.

Table 1 Prescriptive unit savings for ENERGY STAR® CAC subcategories

<table>
<thead>
<tr>
<th>ENERGY STAR® CAC rebate category</th>
<th>Annual energy savings (kWh)</th>
<th>Winter peak demand savings (kW)</th>
<th>Summer peak demand savings (kW)</th>
<th>Annual natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAC with a minimum of 14.5 SEER and 12 EER</td>
<td>112.6</td>
<td>0</td>
<td>0.122</td>
<td>0</td>
</tr>
<tr>
<td>CAC with a minimum of 14.5 SEER and 12 EER – High temperature setting</td>
<td>316.7</td>
<td>0</td>
<td>0.342</td>
<td>0</td>
</tr>
<tr>
<td>CAC with a minimum of 15 SEER and 12 EER</td>
<td>176.7</td>
<td>0</td>
<td>0.191</td>
<td>0</td>
</tr>
<tr>
<td>CAC with a minimum of 15 SEER and 12 EER – High temperature setting</td>
<td>366.1</td>
<td>0</td>
<td>0.396</td>
<td>0</td>
</tr>
</tbody>
</table>

These unit savings are appropriate for the evaluation of the 2010 CSRP and are unchanged from 2009.
**ECM furnace prescriptive savings**

Prescriptive savings for ECM furnaces are provided in Table 2.

Table 2 Prescriptive unit savings for ECM furnace subcategories

<table>
<thead>
<tr>
<th>ECM furnace rebate category</th>
<th>Annual energy savings (kWh)</th>
<th>Winter peak demand savings (kW)</th>
<th>Summer peak demand savings (kW)</th>
<th>Annual natural gas savings (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECM - Existing Home-AHRI Matched CAC/Furnace Continuous Fan (No Change)</td>
<td>2,772</td>
<td>0.391</td>
<td>1.638</td>
<td>-180</td>
</tr>
<tr>
<td>ECM - Existing Home-AHRI Matched CAC/Furnace Non-Continuous Fan (No Change)</td>
<td>324</td>
<td>0.049</td>
<td>0.181</td>
<td>-26</td>
</tr>
<tr>
<td>ECM - Existing Home-AHRI Matched CAC/Furnace- Non-Continuous Fan (Change from Continuous)</td>
<td>3,005</td>
<td>0.424</td>
<td>1.776</td>
<td>-26</td>
</tr>
<tr>
<td>ECM - Existing Home-Unmatched CAC/Furnace Continuous Fan (No Change)</td>
<td>2,821</td>
<td>0.398</td>
<td>1.667</td>
<td>-180</td>
</tr>
<tr>
<td>ECM - Existing Home-Unmatched CAC/Furnace Non Continuous Fan (No Change)</td>
<td>373</td>
<td>0.056</td>
<td>0.208</td>
<td>-26</td>
</tr>
<tr>
<td>ECM - Existing Home-Unmatched CAC/Furnace Non-Continuous Fan (Change from Continuous)</td>
<td>3,054</td>
<td>0.431</td>
<td>1.805</td>
<td>-26</td>
</tr>
<tr>
<td>ECM - Existing Home- Heating Only- Continuous Fan (No Change)</td>
<td>1,534</td>
<td>0.239</td>
<td>0.827</td>
<td>-180</td>
</tr>
<tr>
<td>ECM - Existing Home- Heating Only- Non- Continuous Fan (No Change)</td>
<td>324</td>
<td>0.051</td>
<td>0.175</td>
<td>-26</td>
</tr>
<tr>
<td>ECM - Existing Home- Heating Only- Non- Continuous Fan (Change from Continuous)</td>
<td>1,666</td>
<td>0.260</td>
<td>0.898</td>
<td>-26</td>
</tr>
<tr>
<td>ECM - New Home-AHRI Matched CAC/Furnace Continuous Fan (No Change)</td>
<td>2,865</td>
<td>0.404</td>
<td>1.693</td>
<td>-164</td>
</tr>
<tr>
<td>ECM - New Home-AHRI Matched CAC/Furnace Non-Continuous Fan (No Change)</td>
<td>207</td>
<td>0.031</td>
<td>0.115</td>
<td>-18</td>
</tr>
<tr>
<td>ECM - New Home-AHRI Matched CAC/Furnace- Non-Continuous Fan (Change from Continuous)</td>
<td>3,485</td>
<td>0.492</td>
<td>2.060</td>
<td>-18</td>
</tr>
<tr>
<td>ECM furnace rebate category</td>
<td>Annual energy savings (kWh)</td>
<td>Winter peak demand savings (kW)</td>
<td>Summer peak demand savings (kW)</td>
<td>Annual natural gas savings (m³)</td>
</tr>
<tr>
<td>-----------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>--------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>ECM-New Home-Unmatched CAC/Furnace - Continuous Fan (No Change)</td>
<td>2,925</td>
<td>0.413</td>
<td>1.729</td>
<td>-164</td>
</tr>
<tr>
<td>ECM-New Home-Unmatched CAC/Furnace Non-Continuous Fan (No Change)</td>
<td>267</td>
<td>0.040</td>
<td>0.149</td>
<td>-18</td>
</tr>
<tr>
<td>ECM-New Home-Unmatched CAC/Furnace-Non-Continuous Fan (Change from Continuous)</td>
<td>3,545</td>
<td>0.500</td>
<td>2.095</td>
<td>-18</td>
</tr>
<tr>
<td>ECM-New Home-Heating Only-Continuous Fan (No Change)</td>
<td>1,569</td>
<td>0.245</td>
<td>0.846</td>
<td>-164</td>
</tr>
<tr>
<td>ECM-New Home-Heating Only-Non-Continuous Fan (No Change)</td>
<td>207</td>
<td>0.032</td>
<td>0.112</td>
<td>-18</td>
</tr>
<tr>
<td>ECM-New Home-Heating Only-Non-Continuous Fan (Change from Continuous)</td>
<td>1,700</td>
<td>0.265</td>
<td>0.916</td>
<td>-18</td>
</tr>
</tbody>
</table>

These energy savings are derived from the CCHT study *Final Report on the Effects of ECM Furnace Motors on Electricity and Gas Use*. They compare the energy and gas usage of the energy efficient ECM furnace to a furnace with the same usage criteria but operated with a traditional permanent split capacitor (PSC) motor.

The eighteen subcategories of savings differ in the following ways:

- **Existing vs. new homes.** This criterion separates the use of furnaces in homes built pre- and post-1980. This separation is due to the projection of annual consumption for furnaces in new and existing homes that was used in the CCHT study. Savings are greater in new homes, implying that new homes can utilize the higher efficiency of ECM motors to a greater extent.
- **CAC vs. heating only.** Since furnace fans operate in the summer as part of central air conditioning systems, ECM motors installed on a furnace in a house that has central air conditioning will experience greater savings than an ECM motor installed on a furnace that will be used for heating only.
- **Unmatched vs. AHRI-matched CACs.** For specific combinations of furnaces and CAC systems, the Air-Conditioning, Heating and

---

Refrigeration Institute (AHRI)\(^2\) provides efficiency ratings (EER, SEER and HSPF for heat pumps) that are adjusted to include the energy inputs for the furnace fan, as well as the added cooling load of the fan’s waste heat. These combinations are given a certified AHRI reference number. For AHRI-matched systems, the cooling season demand and energy savings are already incorporated into the CAC demand and energy savings. This is reflected in a higher EER and SEER than an identical CAC that is unmatched. To avoid counting these savings twice, the savings associated with AHRI-matched ECM furnaces are reduced slightly in comparison to non-matched systems.

- Continuous vs. non-continuous. The energy consumed by a furnace fan is largely dependent on the operational settings of that fan. A fan can be run continuous (or ‘On’), which means that the fan runs both when the furnace is in heating or cooling mode, or at a lower speed when the furnace is not running. A fan can also be run non-continuous (or ‘Auto’), which means that the fan runs only when the furnace is in cooling or heating mode. Energy savings will depend greatly on the operation of the furnace fan, and also whether or not the participant switches from one operation mode to another once they install their ECM furnace.

The annual energy, winter peak and summer peak savings are the same as those used by Frontier Associates in the 2009 CSRP evaluation with exceptions for the six subcategories that are designated as ‘Change from continuous’. These six categories replaced the six categories found in the 2009 CSRP evaluation designated as ‘Change from non-continuous’ for the reasons described below.

The 2009 participant survey asked participants who had changed operational settings on their furnace whether they went from ‘Continuous’ to ‘Non-continuous’, or whether they went from ‘Non-continuous’ to ‘Continuous’ when using their new ECM furnace. The 2009 results indicated that more participants went from ‘Non-continuous’ to ‘Continuous’ than from ‘Continuous’ to ‘Non-continuous’. As such, 2009 prescriptive energy savings were derived for ‘Change from non-continuous’ operation. These savings were relatively small since the energy efficiencies of the ECM furnace were offset by the fact that participants were using their fan more after the installation of the ECM furnace than before.

In 2010, the participant survey results indicated just the opposite – more participants were moving from ‘Continuous’ to ‘Non-continuous’. As such, prescriptive energy savings were derived for ‘Change from continuous’ operation. These savings were derived by examining the energy usage of continuous and non-continuous fan usage described

\(^2\) http://www.ahridirectory.org/ahridirectory/pages/home.aspx
in the CCHT study. Savings for these six new subcategories are much greater than the savings in the six ‘change from non-continuous’ subcategories in the 2009 CSRP evaluation since people are switching from running their fan continually to running their fan only when the furnace is in heating or cooling mode – a change that will complement the switch to a more efficient ECM furnace.

When going from a furnace with a traditional PSC motor to an ECM furnace, gas usage associated with the furnace actually increases. The values for the increase in gas usage are those found in the 2011 OPA Prescriptive Measures and Assumptions for the appropriate subcategories of ECM furnaces. These values also originated from the CCHT study Final Report on the Effects of ECM Furnace Motors on Electricity and Gas Use.

Programmable thermostat prescriptive savings

Prescriptive savings for programmable thermostats are provided in Table 3.

<table>
<thead>
<tr>
<th>Programmable thermostat rebate category</th>
<th>Annual energy savings (kWh)</th>
<th>Winter peak demand savings (kW)</th>
<th>Summer peak demand savings (kW)</th>
<th>Annual natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable thermostat – ENERGY STAR® CAC and gas heating</td>
<td>26</td>
<td>0.0017</td>
<td>0.0223</td>
<td>188</td>
</tr>
<tr>
<td>Programmable thermostat – CAC and gas heating</td>
<td>30</td>
<td>0.0019</td>
<td>0.0257</td>
<td>188</td>
</tr>
<tr>
<td>Programmable thermostat – gas heating only</td>
<td>9</td>
<td>0.0006</td>
<td>0.0077</td>
<td>188</td>
</tr>
</tbody>
</table>

The energy and demand savings are the result of an assessment of the average unit savings for programmable thermostats performed by Frontier Associates in the 2009 CSRP evaluation. Of note are the subcategories that include a CAC system. Programmable thermostats can provide savings not only associated with a furnace during the heating months, but also associated with a CAC during the cooling months. Savings associated with a programmable thermostat and an ENERGY STAR® CAC are slightly less than savings for a programmable thermostat and a non-ENERGY STAR® CAC since the ENERGY STAR® CAC uses less energy, and thus will save less energy if it is controlled by the programmable thermostat.

---

IndEco considered these energy and demand unit savings to be appropriate for the evaluation of the 2010 CSRP and has kept them unchanged from 2009.

The assumption that all programmable thermostats are used for furnaces fuelled with gas results from the fact that 97% of 2010 CSRP participants that received rebates for both a programmable thermostat and an ECM furnace indicated that their furnace is fuelled by natural gas, oil or propane. 93% of participants that received programmable thermostats also received a rebate for an ECM furnace, so the assumption that gas is used as a fuel source for all programmable thermostats is quite reasonable.

The values for the gas savings are those found in the 2011 OPA Prescriptive Measures and Assumptions for the appropriate subcategories of programmable thermostats. These values also originated from the CCHT study Final Report on the Effects of ECM Furnace Motors on Electricity and Gas Use.3

**ENERGY STAR® CAC savings allocation**

Savings arising from participation in the ENERGY STAR® CAC component of the 2010 CSRP were calculated by applying the prescriptive energy savings to the number of participants that received each of the two rebates. These participants are listed in Table 4.

<table>
<thead>
<tr>
<th>ENERGY STAR® CAC rebate category</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>$250 CAC rebate (minimum of 14.5 SEER and 12 EER)</td>
<td>10,399</td>
</tr>
<tr>
<td>$400 CAC rebate (minimum of 15 SEER and 12 EER)</td>
<td>24,745</td>
</tr>
</tbody>
</table>

The 2010 CSRP participant survey results were then used to determine the number of participants to which the higher temperature setting prescriptive energy savings should be applied. 55% of participants indicated that they changed their thermostat setting after the installation of their new system. 81% of these participants indicated that they raised the temperature on their thermostat by an average of 2 degrees Celsius and 19% indicated that they lowered the temperature by an average of 1.9 degrees Celsius. It was assumed that the energy savings associated with turning a CAC thermostat two degrees warmer would be equal to the additional energy use associated with turning a CAC thermostat two degrees colder. Thus, the net result of this is that the higher temperature prescriptive energy savings were initially mapped onto 62% (81% - 19%) of participants who indicated a change in CAC thermostat setting. This amounts to 34% of the total ENERGY STAR® CAC participants.

A further consideration is that some participants would have raised
their CAC thermostat setting regardless of whether or not they had participated in the program. It was assumed that 50% of participants would have increased their temperature setting even if they had installed a standard central AC unit. This assumption was first made in the 2008 CSRP evaluation and maintained in both the 2009 and now 2010 CSRP evaluations.

This percentage has a strong impact on the distribution of participants between regular ENERGY STAR® CAC energy savings and those associated with the higher temperature setting. As such, we suggest that a more thorough determination of this value should be included in future evaluations. After accounting for this adjustment, 17% of participants were classified as achieving higher temperature prescriptive energy savings.

**ECM furnace savings allocation**

60,720 participants received rebates for ECM furnaces as part of the 2010 CSRP, as determined using the 2010 CSRP tracking system. These participants were placed in the appropriate ECM furnace subcategory depending on the age of their home, the existence of a central CAC, whether the CAC/ECM furnace was AHRI-matched and the fan setting that was used.

The assumption adopted in 2008 and 2009 that 54% of participants live in homes built in 1980 or later and 46% of participants live in homes built before 1980 was maintained for the 2010 CSRP evaluation. While this is a question on the application form to the CSRP, it does not appear in the 2010 CSRP database. Future CSRP databases should include this piece of information.

Of the 60,720 participants that received ECM furnace rebates, the 2010 CSRP tracking system indicated that 25,698 participants received rebates for both an ECM furnace and a CAC system. In addition to those that received rebates for both ECM furnaces and CAC systems, the participant survey indicated that 80% of participants that did not receive a rebate for a CAC have an existing central air conditioning system. Thus, 53,715 participants who received a rebated for an ECM furnace also have a CAC system in their homes.

Of these 53,715 participants, the 28,017 participants who did not receive a rebate for a CAC system were considered as non-AHRI matched. This is appropriate since no energy savings are attributed to the CAC systems in these homes (no CAC rebate was provided to them).

Of the 25,698 participants that received a rebate for both an ECM furnace and an ENERGY STAR® CAC, the fraction that can be considered AHRI-matched was then determined. This was done by examining the 2010 CSRP database for all participants that received an ECM furnace rebate, a CAC rebate and had an AHRI reference number associated with the new CAC system. A full 100% of participants who received rebates for both an ECM furnace and a CAC had certified AHRI-reference numbers.
This result is somewhat different than the results of the 2009 CSRP evaluation. In the 2009 evaluation, only 69% of participants receiving both an ECM furnace rebate and a CAC rebate were found to be AHRI-matched. The reason for the change could be two-fold. Firstly, it may be that more contractors are recommending ECM furnace/CAC system combinations that are AHRI-matched, and that participants are taking their advice. The 2010 CSRP participant survey suggests that 32% of participants were strongly influenced by their contractor when selecting a CAC system and 31% of participants were strongly influenced by their contractor when selecting an ECM furnace. The 2009 CSRP evaluation found the results to me much lower – closer to 5-6% of participants being strongly influenced by their contractor when selecting a CAC or ECM furnace. Secondly, it could simply be the case that contractors are being more diligent in recording the AHRI certified reference numbers when installing CAC systems.

The 2010 CSRP participant survey asked participants to indicate if they set their furnace fans to ‘Continuous’ or ‘Non-continuous’ when using their new ECM furnace, and whether or not these settings were different than what was used for the previous furnace. The questions were asked for both winter and summer settings. The results for the winter settings were selected to be indicative of the behaviour of the participant. This is done since the winter heating months tend to dominate furnace fan operation, and since the 2009 CSRP evaluation also opted to rely on responses related to the winter fan settings.

The 2010 CSRP participant survey results for winter fan settings are presented on Table 5.

**Table 5 Winter furnace fan settings**

<table>
<thead>
<tr>
<th>Fan settings before and after program participation</th>
<th>% of program participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous to continuous</td>
<td>11.7%</td>
</tr>
<tr>
<td>Continuous to non-continuous</td>
<td>19.9%</td>
</tr>
<tr>
<td>Non-continuous to continuous</td>
<td>14.3%</td>
</tr>
<tr>
<td>Non-continuous to non-continuous</td>
<td>54.1%</td>
</tr>
</tbody>
</table>

These results were simplified by recognizing that the 14.3% of participants that switched from non-continuous to continuous and the 14.3% (out of the 19.9%) that switched from continuous to non-continuous had the same net effect as an additional 14.3% of participants maintaining continuous usage and 14.3% of participants maintaining non-continuous usage, with 5.6% remaining that switched from continuous to non-continuous. Thus, the equivalent furnace fan settings that were used are presented on Table 6.

**Table 6 Equivalent winter furnace fan settings**
<table>
<thead>
<tr>
<th>Fan settings before and after program participation</th>
<th>% of program participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous to continuous</td>
<td>26.0%</td>
</tr>
<tr>
<td>Continuous to non-continuous</td>
<td>5.6%</td>
</tr>
<tr>
<td>Non-continuous to non-continuous</td>
<td>68.4%</td>
</tr>
</tbody>
</table>

As mentioned earlier, this result is slightly different from the results found in the 2009 CSRP evaluation, where there was a greater net shift from non-continuous to continuous, instead of from continuous to non-continuous, as was the case in 2010. The shift towards non-continuous is a positive one since there is less energy used when running the fan non-continuously.

**Programmable thermostat savings allocation**

According to the 2010 CSRP database, 40,762 participants received rebates for programmable thermostats. The database also indicated that 20,522 participants received rebates for CAC systems. Energy savings associated with a programmable thermostat and an ENERGY STAR® CAC system were given to these participants. From the participant survey, 80% of participants that did not receive a rebate for an ENERGY STAR® CAC indicated that they have central air conditioning. Annual energy savings associated with an average-efficiency CAC system were given to these 16,192 participants. The remaining 4,048 participants were assumed to use their programmable thermostats for heating only.

**2010 CSRP gross energy savings**

Table 7 presents the gross energy savings associated with ECM furnaces, CAC systems and programmable thermostats. The total gross impacts for the 2010 CSRP, including peak demand savings and natural gas impacts, are summarized in Table 8. Impacts over the life of the measures are presented in Table 9.
Table 7 Province-wide 2010 CSRP gross impacts by participant category

<table>
<thead>
<tr>
<th>2010 CSRP gross impacts</th>
<th>Participants</th>
<th>Gross annual electricity savings (kWh)</th>
<th>Total gross annual electricity savings (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2010 CSRP ECM furnace impacts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECM -Existing Home-AHRI Matched CAC/Furnace Continuous Fan (No Change)</td>
<td>3,073</td>
<td>2,772</td>
<td>8,519,689</td>
</tr>
<tr>
<td>ECM-Existing Home-AHRI Matched CAC/Furnace Non-Continuous Fan (No Change)</td>
<td>8,088</td>
<td>324</td>
<td>2,620,506</td>
</tr>
<tr>
<td>ECM-Existing Home-AHRI Matched CAC/Furnace Non-Continuous Fan (Change from Continuous)</td>
<td>660</td>
<td>3,005</td>
<td>1,982,147</td>
</tr>
<tr>
<td>ECM-Existing Home-Unmatched CAC/Furnace Continuous Fan (No Change)</td>
<td>3,351</td>
<td>2,821</td>
<td>9,452,903</td>
</tr>
<tr>
<td>ECM-Existing Home-Unmatched CAC/Furnace Non Continuous Fan (No Change)</td>
<td>8,818</td>
<td>373</td>
<td>3,289,127</td>
</tr>
<tr>
<td>ECM-Existing Home-Unmatched CAC/Furnace Non-Continuous Fan (Change from Continuous)</td>
<td>719</td>
<td>3,054</td>
<td>2,196,302</td>
</tr>
<tr>
<td>ECM-Existing Home-Heating Only-Continuous Fan (No Change)</td>
<td>838</td>
<td>1,534</td>
<td>1,285,072</td>
</tr>
<tr>
<td>ECM-Existing Home-Heating Only-Non-Continuous Fan (No Change)</td>
<td>2,205</td>
<td>324</td>
<td>714,261</td>
</tr>
<tr>
<td>ECM-Existing Home-Heating Only-Non-Continuous Fan (Change from Continuous)</td>
<td>180</td>
<td>1,666</td>
<td>299,528</td>
</tr>
<tr>
<td>ECM-New Home-AHRI Matched CAC/Furnace Continuous Fan (No Change)</td>
<td>3,608</td>
<td>2,865</td>
<td>10,336,918</td>
</tr>
<tr>
<td>ECM-New Home-AHRI Matched CAC/Furnace - Non-Continuous Fan (No Change)</td>
<td>9,495</td>
<td>207</td>
<td>1,965,380</td>
</tr>
<tr>
<td>ECM-New Home-AHRI Matched CAC/Furnace Non-Continuous Fan (Change from Continuous)</td>
<td>774</td>
<td>3,485</td>
<td>2,698,547</td>
</tr>
<tr>
<td>ECM-New Home-Unmatched CAC/Furnace - Continuous Fan (No Change)</td>
<td>3,934</td>
<td>2,925</td>
<td>11,505,988</td>
</tr>
<tr>
<td>ECM-New Home-Unmatched CAC/Furnace Non-Continuous Fan (No Change)</td>
<td>10,352</td>
<td>267</td>
<td>2,763,879</td>
</tr>
<tr>
<td>2010 CSRP gross impacts</td>
<td>Participants</td>
<td>Gross annual electricity savings (kWh)</td>
<td>Total gross annual electricity savings (kWh)</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------</td>
<td>----------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>ECM-New Home-Unmatched CAC/Furnace Non-Continuous Fan (Change from Continuous)</td>
<td>844</td>
<td>3,545</td>
<td>2,992,782</td>
</tr>
<tr>
<td>ECM-New Home-Heating Only-Continuous Fan (No Change)</td>
<td>983</td>
<td>1,569</td>
<td>1,542,982</td>
</tr>
<tr>
<td>ECM-New Home-Heating Only-Non-Continuous Fan (No Change)</td>
<td>2,588</td>
<td>207</td>
<td>535,696</td>
</tr>
<tr>
<td>ECM-New Home-Heating Only-Non-Continuous Fan (Change from Continuous)</td>
<td>211</td>
<td>1,700</td>
<td>358,796</td>
</tr>
<tr>
<td><strong>Total for ECM furnaces</strong></td>
<td><strong>60,720</strong></td>
<td><strong>1,071.5</strong></td>
<td><strong>65,060,504</strong></td>
</tr>
</tbody>
</table>

Table 7 continued. Province-wide 2010 CSRP gross impacts by participant category

<table>
<thead>
<tr>
<th>2010 CSRP gross impacts</th>
<th>Participants</th>
<th>Gross annual electricity savings (kWh)</th>
<th>Total gross annual electricity savings (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 CSRP ENERGY STAR® CAC impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.5 SEER</td>
<td>8,626</td>
<td>113</td>
<td>971,284</td>
</tr>
<tr>
<td>14.5 SEER HT</td>
<td>1,773</td>
<td>317</td>
<td>561,518</td>
</tr>
<tr>
<td>15 SEER</td>
<td>20,526</td>
<td>177</td>
<td>3,626,940</td>
</tr>
<tr>
<td>15 SEER HT</td>
<td>4,219</td>
<td>366</td>
<td>1,544,584</td>
</tr>
<tr>
<td><strong>Total for ENERGY STAR® CAC</strong></td>
<td><strong>35,144</strong></td>
<td><strong>190.8</strong></td>
<td><strong>6,704,327</strong></td>
</tr>
</tbody>
</table>

| 2010 CSRP Programmable thermostat impacts | | | |
| Programmable thermostat-CAC and gas heating | 16,192 | 30 | 485,760 |
| Programmable thermostat-ENERGY STAR® CAC and gas heating | 20,522 | 26 | 533,572 |
| Programmable thermostat-gas heating only | 4,048 | 9 | 36,432 |
| **Total for programmable thermostats** | **40,762** | **25.9** | **1,055,764** |
Table 8 Province-wide 2010 CSRP gross annual impacts summary

<table>
<thead>
<tr>
<th>2010 CSRP gross impacts</th>
<th>Participants</th>
<th>Gross annual electricity savings (kWh)</th>
<th>Total gross annual electricity savings (kWh)</th>
<th>Gross winter coincident peak savings (kW)</th>
<th>Gross summer coincident peak savings (kW)</th>
<th>Total gross natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>60,720</td>
<td>1,071.5</td>
<td>65,060,504</td>
<td>9,347</td>
<td>37,855</td>
<td>-3,679,438</td>
</tr>
<tr>
<td>Total for ENERGY STAR® CAC</td>
<td>35,144</td>
<td>190.8</td>
<td>6,704,327</td>
<td>0</td>
<td>7,247</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>40,762</td>
<td>25.9</td>
<td>1,055,764</td>
<td>68</td>
<td>904</td>
<td>7,663,256</td>
</tr>
<tr>
<td>Total for 2010 CSRP</td>
<td>136,626</td>
<td></td>
<td>72,820,595</td>
<td>9,416</td>
<td>46,005</td>
<td>3,983,818</td>
</tr>
</tbody>
</table>

Table 9 Province-wide 2010 CSRP gross lifetime impacts summary

<table>
<thead>
<tr>
<th>2010 CSRP gross impacts (lifetime)</th>
<th>Participants</th>
<th>Total lifetime electricity savings (kWh)</th>
<th>Gross lifetime winter coincident peak savings (kW-year)</th>
<th>Gross lifetime summer coincident peak savings (kW-year)</th>
<th>Total gross lifetime natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>60,720</td>
<td>1,236,149,568</td>
<td>177,602</td>
<td>719,240</td>
<td>-69,909,316</td>
</tr>
<tr>
<td>Total for ENERGY STAR® CAC</td>
<td>35,144</td>
<td>120,677,887</td>
<td>0</td>
<td>130,442</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>40,762</td>
<td>15,836,460</td>
<td>1,027</td>
<td>13,557</td>
<td>114,948,840</td>
</tr>
<tr>
<td>Total for 2010 CSRP</td>
<td>136,626</td>
<td>1,372,663,915</td>
<td>178,629</td>
<td>863,239</td>
<td>45,039,524</td>
</tr>
</tbody>
</table>
2010 CSRP net-to-gross ratio determination

Table 10 provides the net-to-gross ratios calculated by Frontier Associates in the 2009 CSRP evaluation for ECM furnaces, ENERGY STAR® CAC and programmable thermostats. Frontier has calculated NTG ratios that account for the existence of the ecoENERGY program and the Ontario Home Energy Savings Program, and NTG ratios that would be used if the programs did not exist. A comparison of the two values for each measure shows that the NTG ratios are very similar in magnitude. Programmable thermostat NTG ratios would not be affected by the loss of the ecoENERGY and OHESP since these programs do not offer incentives for programmable thermostats.

Table 10 Net to Gross (NTG) ratios with and without the existence of ecoENERGY and OHESP

<table>
<thead>
<tr>
<th>Measure</th>
<th>2009 NTG ratio accounting for ecoENERGY and OHESP</th>
<th>NTG ratio in the absence of ecoENERGY and OHESP</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY STAR® CAC</td>
<td>57.7%</td>
<td>58.7%</td>
</tr>
<tr>
<td>ECM furnace</td>
<td>39.7%</td>
<td>48.4%</td>
</tr>
<tr>
<td>Programmable thermostat</td>
<td>39.2%</td>
<td>39.2%</td>
</tr>
</tbody>
</table>

The ecoENERGY program and the Ontario Home Energy Savings Program stopped accepting new applications as of March 31, 2010, though customers who undertook their pre-assessment prior to March 31, 2010 were still eligible to claim an ecoENERGY and OHESP grant until March 31, 2011. As such, the change in uptake of ecoENERGY and OHESP between 2009 and 2010 was examined to determine whether or not the 2010 NTG ratio should be adjusted from the value used for the 2009 evaluation.

Table 11 gives the percentage of participants that received government incentives for the installation of ECM furnaces and ENERGY STAR® CACs. The 2009 values were taken from the 2009 CSRP evaluation. The 2010 participant survey was used to get the percentage of CSRP participants who received ecoENERGY or OHESP grants in 2010.

---

In addition, new applications to the ecoENERGY homes application will be accepted for work undertaken after June 6, 2011 (but the OHESP program no longer exists).
Table 11 Percentage of CSRP participants who received ecoENERGY or OHESP grants as well

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010 ecoENERGY</th>
<th>2010 OHESP</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECM furnaces</td>
<td>54.1%</td>
<td>57%</td>
<td>75%</td>
</tr>
<tr>
<td>ENERGY STAR® CAC</td>
<td>51.1%</td>
<td>50%</td>
<td>68%</td>
</tr>
</tbody>
</table>

Notes: 2009 values are the CSRP rebate-weighted average based on contractor surveys, as reported in Frontier, 2010:p.51. Values for 2010 are from the participant surveys and participants reported different values for the two programs, even though they were run together.

A comparison of the 2009 and 2010 percentages in Table 11 indicates that roughly the same percentage of participants received ecoENERGY and OHESP grants in 2009 and 2010, if not more in 2010. This may be due to the fact that participants who undertook their pre-assessment prior to March 31, 2010 were still eligible to claim an ecoENERGY and OHESP grant until March 31, 2011. It may also be possible that ecoENERGY and OHESP received a bump in participation when the ends of the programs were announced. Alternatively, results for 2009 and 2010 values may not be fully comparable simply due to a difference in responses arising from the different surveying methods used between 2009 and 2010.

We have used the 2009 NTG ratios as a basis for the 2010 NTG ratio since the survey responses indicate that ecoENERGY and OHESP continued to be a relatively equal presence in 2009 and 2010. Furthermore, the fact that the NTG ratios with and without ecoENERGY and OHESP are so similar, a change to the NTG ratio that excludes the existence of ecoENERGY and OHESP would not have a significant impact on results.

A small adjustment to the 2009 NTG ratio was done in developing the 2010 NTG ratio. This adjustment saw the incorporation of the participant spillover into the 2010 NTG ratio.

Participant spillover was estimated by examining the percentage of participants that considered energy conservation to be of low importance and yet opted to purchase and install additional energy efficient equipment. These results are shown as the ‘reported fraction of respondents’ in Table 12.
Table 12 Participant spillover incorporated into the 2010 NTG ratio

<table>
<thead>
<tr>
<th>Additional energy efficiency action</th>
<th>Reported fraction of respondents</th>
<th>Reduced fraction of respondents</th>
<th>Participants</th>
<th>Assumed annual electricity savings (kWh)</th>
<th>Total annual electricity savings per participant (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>52%</td>
<td>4.7%</td>
<td>3,350</td>
<td>40</td>
<td>134,016</td>
</tr>
<tr>
<td>Cooling or heating</td>
<td>14%</td>
<td>1.3%</td>
<td>902</td>
<td>100</td>
<td>90,203</td>
</tr>
<tr>
<td>Water heating</td>
<td>22%</td>
<td>2.0%</td>
<td>1,417</td>
<td>141</td>
<td>199,864</td>
</tr>
<tr>
<td>Appliances</td>
<td>34%</td>
<td>3.1%</td>
<td>2,191</td>
<td>76</td>
<td>166,489</td>
</tr>
<tr>
<td>Insulation or other weatherization</td>
<td>40%</td>
<td>3.6%</td>
<td>2,577</td>
<td>75</td>
<td>193,292</td>
</tr>
<tr>
<td>Windows</td>
<td>32%</td>
<td>2.9%</td>
<td>2,062</td>
<td>100</td>
<td>206,178</td>
</tr>
<tr>
<td>Other products</td>
<td>5%</td>
<td>0.5%</td>
<td>322</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

This result was scaled down since it was unlikely that that many participants took part in these energy efficiency actions solely due to their involvement in the 2010 CSRP. These results were thus reduced to the values presented in the ‘reduced fraction of respondents’ column. This reduction was done by cross-referencing the percentage of participants that indicated that they considered energy conservation over the past five years to be somewhat important or less to the percentage of participants that indicated that they took part, or likely took part, in energy efficiency improvements as a direct result of their involvement in the 2010 CSRP.

The final NTG ratio used for the 2010 CSRP is presented in Table 13.

Table 13 2010 CSRP net-to-gross ratios

<table>
<thead>
<tr>
<th>Measure</th>
<th>2010 NTG ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY STAR® CAC</td>
<td>59.6%</td>
</tr>
<tr>
<td>ECM furnace</td>
<td>41.0%</td>
</tr>
<tr>
<td>Programmable thermostat</td>
<td>40.5%</td>
</tr>
</tbody>
</table>

2010 CSRP net energy savings

The total net impacts for the 2010 CSRP, including peak and natural gas impacts, are summarized in Table 14 and Table 15.
Table 14 Province-wide 2010 CSRP net annual impacts summary

<table>
<thead>
<tr>
<th>2010 CSRP net impacts</th>
<th>Participants</th>
<th>Net annual electricity savings (kWh)</th>
<th>Total net annual electricity savings (kWh)</th>
<th>Net winter coincident peak savings (kW)</th>
<th>Net summer coincident peak savings (kW)</th>
<th>Total net natural gas savings (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>60,720</td>
<td>439.6</td>
<td>26,692,082</td>
<td>3,835</td>
<td>15,530</td>
<td>-1,509,546</td>
</tr>
<tr>
<td>Total for ENERGY STAR® CAC</td>
<td>35,144</td>
<td>113.8</td>
<td>3,997,657</td>
<td>0</td>
<td>4,321</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>40,762</td>
<td>10.5</td>
<td>427,688</td>
<td>28</td>
<td>366</td>
<td>3,104,373</td>
</tr>
<tr>
<td><strong>Total for 2010 CSRP</strong></td>
<td><strong>136,626</strong></td>
<td></td>
<td><strong>31,117,427</strong></td>
<td><strong>3,863</strong></td>
<td><strong>20,218</strong></td>
<td><strong>1,594,827</strong></td>
</tr>
</tbody>
</table>

Table 15 Province-wide 2010 CSRP net lifetime impacts summary

<table>
<thead>
<tr>
<th>2010 CSRP net impacts (lifetime)</th>
<th>Participants</th>
<th>Total net lifetime electricity savings (kWh)</th>
<th>Net lifetime winter coincident peak savings (kW-year)</th>
<th>Net lifetime summer coincident peak savings (kW-year)</th>
<th>Total net lifetime natural gas savings (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>60,720</td>
<td>507,149,550</td>
<td>72,864</td>
<td>295,079</td>
<td>-28,681,382</td>
</tr>
<tr>
<td>Total for ENERGY STAR® CAC</td>
<td>35,144</td>
<td>71,957,825</td>
<td>0</td>
<td>77,780</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>40,762</td>
<td>6,415,325</td>
<td>416</td>
<td>5,492</td>
<td>46,565,597</td>
</tr>
<tr>
<td><strong>Total for 2010 CSRP</strong></td>
<td><strong>136,626</strong></td>
<td><strong>585,522,701</strong></td>
<td><strong>73,280</strong></td>
<td><strong>378,351</strong></td>
<td><strong>17,884,215</strong></td>
</tr>
</tbody>
</table>

2011 forecasts

To forecast the uptake and energy savings of the 2011 CSRP, several issues were considered:

- The historic growth rate of the CSRP. The historic growth rate of the CSRP was estimated by examining the increase in ECM furnace and ENERGY STAR® CAC installs for the years in which ecoENERGY was fully available. Annual growth rates of 8% for ECM furnace installs and 5% for ENERGY STAR® CAC installs
were estimated.

- The presence of ecoENERGY. The ecoENERGY program ended as of March 31, 2010, but was renewed June 6, 2011, until March 31, 2012. The 2011 CSRP program uptake based on ecoENERGY ramping up from June 2011, until it hit full capacity in December 2011.

- The number of participants that are influenced by the size of the incentive. Not all participants are influenced by the size of the incentive. The percentage of participants that are influenced by the size of the incentive was estimated by subtracting out the percentage of participants that considered neither the CSRP incentive nor the ecoENERGY incentive to be a strong influence on their purchasing of an ECM furnace or an ENERGY STAR® CAC. Once the percentage of participants that are influenced by the size of the incentive was known, the change in uptake related to the partial loss of the ecoENERGY program in 2011 was estimated.

- The increase in incentive from $125 per ECM furnace install in 2010 to $250 per ECM furnace install in 2011. The increase in uptake brought on by the increase in furnace incentive size was estimated and applied to the percentage of people that are influenced by incentive size.

The net-to-gross ratio and energy savings estimates used for the 2011 forecast were the same as those for 2010. Participant behaviour (e.g. the percentage of participants that adjusted thermostat settings, etc.) was also kept the same as 2010. Spillover was adjusted to reflect 2011 participation rates. Spillover is incorporated into the savings shown in Table 17 through Table 20.

Participation in the 2011 CSRP is estimated to increase by approximately 5% in total, as shown in Table 16.

---

5 No new participants were accepted into the program after March 31, 2010, however, participants who had already undertaken their initial assessment were given until March 31, 2011 to complete their retrofits.
Table 16 Percentage increase in participation from 2010 to 2011

<table>
<thead>
<tr>
<th></th>
<th>2010 participants</th>
<th>Forecasted 2011 participants</th>
<th>Percentage increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECM furnaces</td>
<td>60,720</td>
<td>67,999</td>
<td>12.0%</td>
</tr>
<tr>
<td>ENERGY STAR® CAC</td>
<td>35,144</td>
<td>34,324</td>
<td>-2.3%</td>
</tr>
<tr>
<td>PStats</td>
<td>40,762</td>
<td>41,608</td>
<td>2.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>136,626</strong></td>
<td><strong>143,932</strong></td>
<td><strong>5.3%</strong></td>
</tr>
</tbody>
</table>

Note that the uptake in ENERGY STAR® CACs is expected to decrease slightly. The reason for this is that the expected growth is more than offset by the fact that the ecoENERGY program will have a reduced impact in 2011. Negative growth is not seen for ECM furnaces due to the increase in the ECM furnace incentive level.

Table 17 and Table 18 provide the estimated gross annual and gross lifetime impacts of the 2011 CSRP, respectively. Table 19 and Table 20 provide the estimated net annual and net lifetime impacts of the 2011 CSRP, respectively.

Table 17 Projected 2011 CSRP gross annual impacts

<table>
<thead>
<tr>
<th>2011 CSRP gross impacts</th>
<th>Participants</th>
<th>Gross annual electricity savings (kWh)</th>
<th>Total gross annual electricity savings (kWh)</th>
<th>Gross winter coincident peak savings (kW)</th>
<th>Gross summer coincident peak savings (kW)</th>
<th>Total gross natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>67,999</td>
<td>1,071.5</td>
<td>72,860,359</td>
<td>10,468</td>
<td>42,393</td>
<td>-4,120,551</td>
</tr>
<tr>
<td>Total for ENERGY STAR CAC</td>
<td>34,324</td>
<td>191.1</td>
<td>6,560,104</td>
<td>0</td>
<td>7,078</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>41,608</td>
<td>25.9</td>
<td>1,077,677</td>
<td>70</td>
<td>923</td>
<td>7,822,311</td>
</tr>
<tr>
<td><strong>Total for 2010 CSRP</strong></td>
<td><strong>80,498,140</strong></td>
<td><strong>10,538</strong></td>
<td><strong>50,393</strong></td>
<td><strong>3,701,760</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 18 Projected 2011 CSRP gross lifetime impacts

<table>
<thead>
<tr>
<th>2011 CSRP gross impacts (lifetime)</th>
<th>Participants</th>
<th>Total gross lifetime electricity savings (kWh)</th>
<th>Gross lifetime winter coincident peak savings (kW-year)</th>
<th>Gross lifetime summer coincident peak savings (kW-year)</th>
<th>Total gross lifetime natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>67,999</td>
<td>1,384,346,814</td>
<td>198,894</td>
<td>805,467</td>
<td>-78,290,477</td>
</tr>
<tr>
<td>Total for ENERGY STAR CAC</td>
<td>34,324</td>
<td>118,081,871</td>
<td>0</td>
<td>127,400</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>41,608</td>
<td>16,165,154</td>
<td>1,048</td>
<td>13,838</td>
<td>117,334,665</td>
</tr>
<tr>
<td>Total for 2010 CSRP</td>
<td></td>
<td>1,518,593,839</td>
<td>199,942</td>
<td>946,705</td>
<td>39,044,188</td>
</tr>
</tbody>
</table>

Table 19 Projected 2011 CSRP net annual impacts

<table>
<thead>
<tr>
<th>2011 CSRP net impacts</th>
<th>Participants</th>
<th>Net annual electricity savings (kWh)</th>
<th>Total net annual electricity savings (kWh)</th>
<th>Net winter coincident peak savings (kW)</th>
<th>Net summer coincident peak savings (kW)</th>
<th>Total net natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>67,999</td>
<td>439.8</td>
<td>29,907,179</td>
<td>4,297</td>
<td>17,401</td>
<td>-1,691,373</td>
</tr>
<tr>
<td>Total for ENERGY STAR CAC</td>
<td>34,324</td>
<td>113.6</td>
<td>3,897,606</td>
<td>0</td>
<td>4,205</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>41,608</td>
<td>10.5</td>
<td>435,542</td>
<td>28</td>
<td>373</td>
<td>3,161,380</td>
</tr>
<tr>
<td>Total for 2010 CSRP</td>
<td></td>
<td>34,240,328</td>
<td>4,325</td>
<td>21,979</td>
<td>1,470,007</td>
<td></td>
</tr>
</tbody>
</table>
Table 20 Projected 2011 CSRP net lifetime impacts

<table>
<thead>
<tr>
<th>2011 CSRP net impacts (lifetime)</th>
<th>Participants</th>
<th>Total net lifetime electricity savings (kWh)</th>
<th>Net lifetime winter coincident peak savings (kW-year)</th>
<th>Net lifetime summer coincident peak savings (kW-year)</th>
<th>Total net lifetime natural gas savings (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for ECM furnaces</td>
<td>67,999</td>
<td>568,236,404</td>
<td>81,640</td>
<td>330,622</td>
<td>-32,136,094</td>
</tr>
<tr>
<td>Total for ENERGY STAR CAC</td>
<td>34,324</td>
<td>70,156,913</td>
<td>0</td>
<td>75,693</td>
<td>0</td>
</tr>
<tr>
<td>Total for programmable thermostats</td>
<td>41,608</td>
<td>6,533,133</td>
<td>424</td>
<td>5,593</td>
<td>47,420,703</td>
</tr>
<tr>
<td>Total for 2010 CSRP</td>
<td>644,926,449</td>
<td>82,064</td>
<td>411,908</td>
<td>15,284,609</td>
<td></td>
</tr>
</tbody>
</table>

Additional factors that may influence program uptake and that were not considered in this analysis include:

- The perceived state of the economy. The economy has not yet re-stabilized from the recession, but is now stronger than in 2009.
- The long-term forecast for warmer summers.
- Anticipated increases in energy costs.
- Existence of other rebate programs and/or efficiency standards.

**Hypothetical cost effectiveness**

Total Resource Cost (TRC) and Program Administrator Cost (PAC) cost effectiveness tests were run using the forecasted 2011 participant rates to determine the hypothetical cost effectiveness of the 2011 CSRP. For both tests, the program costs were scaled proportionally to the number of participants in 2011. For the PAC test, the total incentives were calculated using the new ECM furnace incentive of $250, as well as the existing incentives for CACs and programmable thermostats.

Net TRC benefits in 2011 are very significant and the TRC benefit cost ratio is significantly greater than 1.0. Despite the increase in the incentive offered, the program is very positive from both the TRC and PAC viewpoints.
Market characterization

The market characterization for the 2010 evaluation considers four primary issues:

• Participation in and influence of other incentive programs, including an overview of other programs, participation levels, influence of other programs, and changes in participation in ecoENERGY
• Market trends including recent participation, economic conditions, participant attitudes, market penetration and saturation of ECM furnaces and CACs
• Effectiveness of marketing efforts
• Participant forecast, and projected cost effectiveness.

A full net to gross ratio (NTGR) assessment was not requested as part of the 2010 CSRP evaluation. However, we used data collected for the Levels of participation in other incentive programs and Market characterization sections to consider revisions to the program NTGR.

Participation in other incentive programs

IndEco considered the level of CSRP participation in other programs through which they received rebates for the same equipment, and the relative importance of various other programs to CSRP participants’ decision-making. Data from the online survey of participants is the primary source of information and is supplemented with results from the online survey of contractors.

The majority of CSRP program participants are receiving incentives from other programs. Despite the availability of other incentive programs, the CSRP program has an important effect on purchasing decisions for both central air conditioners and ECM furnaces.

The CSRP compared favourably to other programs and rebates. Overall, the CSRP program was identified by participants as the most influential program in influencing purchasing decisions for both air conditioners and furnaces. The only other factors that were more important than the CSRP were the age of previous furnaces, and the impact on monthly energy bills for both air conditioners and furnaces.\(^6\) Contractors also identified the CSRP rebate as the most influential incentive program.

However, when analyzing only the subsample of relevant participants’ ratings of different programs, the ecoENERGY program was identified as “strongly influential” by a higher percentage of respondents for both central air conditioner and ECM furnaces. This may reflect the high value of this rebate. Manufacturer rebates and contractor discounts were not nearly as influential as either the CSRP or the ecoENERGY program.

\(^6\) See Participant attitudes for more details.
As reported in 2009, the CSRP appears to be slightly more influential for air conditioners than for furnaces; 51% of CSRP air conditioner participants identified it as “strongly influential” for their purchase, as compared to 46% for ECM furnace participants. Relative to other programs, it also appears to be slightly more important for CACs than for ECM furnaces. These results are consistent across the contractor and participant surveys.

Overview of other available incentive programs

In 2010, there were a number of other incentives available to consumers for the purchase of ENERGY STAR® air conditioners and ECM furnaces. The federal ecoENERGY program offered rebates of $500 for ECM furnaces with an AFU of 92% or better, and rebates of $200 for the replacement of central air conditioning units with ENERGY STAR® systems. The Ontario Home Energy Savings program provided rebates to match the ecoENERGY rebates, doubling the incentive. Both programs required home energy audits as a condition of eligibility. The ecoENERGY program and the Ontario Home Energy Savings Program stopped accepting new applications as of March 31, 2010, though customers who undertook their pre-assessment prior to March 31, 2010 were still eligible to claim an ecoENERGY and OHESP grant until March 31, 2011.

In addition, the majority of manufacturers offered cash rebates or other incentives to encourage customers to purchase higher-end models. Manufacturers explained that higher-end models also tend to be the most energy-efficient models. However, there are generally other factors that influence rebate levels (e.g. noise level, company profitability). For furnaces, rebates are often a function of AFU ratings; the higher end products with large incentives generally also include ECM motors, but different rebates would be available for furnaces with the same motor. For air conditioning units, SEER ratings are generally the primary criteria for the rebate. Several manufacturers only offer rebates or other incentive programs (extended warranties, parts, labour, etc.) in the spring or fall.

Some manufacturers offered these incentives directly to customers, while others offered them to contractors / dealers. According to those who provide contractors incentives, consumers buy products based on the input of contractors / dealers. Contractors / dealers know how to sell products in their particular marketplace and generally pass on all or part of these rebates to their customers.

Contractors also offered discounts on installation of this equipment; 15% of contractors reported that they “usually” offer discounts, 15% “sometimes” offer discounts, and 21% “occasionally” offer discounts. They did not report the size of these discounts or the factors that influence them.

Gas utilities Enbridge Gas and Union Gas did not offer any high-efficiency furnace rebates or incentives in 2010. They also indicated that they do not have any additional furnace incentive programs planned because of the new standards and associated increase in
free-ridership rates. Enbridge did suggest that furnaces might be included within a “whole home” approach in the future.

Finally, some customers were eligible for other incentives, such as Home Renovation Tax Credits.

**Participation levels**

Based on the results of participant surveys, the majority of CSRP participants received rebates from other programs. Based on participant responses, these additional rebates were substantial in size, though 60% of participants were not able to report the amounts that they received under other incentive programs. In addition, the CSRP was the only incentive program for 8% of ECM furnace purchases and 16% of central air conditioning unit purchasers.

As illustrated in Table 21, 84% of those who received CSRP rebates for central air conditioners also participated in other incentive programs. The Ontario Home Energy Savings Program (OHESP) was the most common additional program, providing rebates to 68% of participants. The federal ecoENERGY program was also commonly used, providing rebates to 50% of participants. Substantially smaller numbers of participants received incentives from manufacturers and contractors (27% and 13%, respectively).

The highest average reported value of rebates from another program was $1,424 for the federal ecoENERGY program. However, the majority of participants (54%-68% depending on rebate type) did not know the value of the incentives they had received.

As illustrated in Table 22, higher numbers of those who received rebates for ECM furnaces also participated in other incentive programs. Of the 91% who reported receiving rebates from other sources, 75% received OHESP rebates and 57% received ecoENERGY rebates. Manufacturer rebates, contractor discounts, and federal tax credits were next most common, at 22%, 10%, and 10%, respectively. 5% reported receiving rebates from gas utilities.

The highest average value of reported incentives from another program was $1,247 for the federal ecoENERGY program. Again, as reported in Appendix A, the majority of participants (62-71%) did not know the value of the incentives that they had received. Reported

---

7 In fact, these programs were run together, and the post-retrofit assessor would submit the application for a grant to both the federal and the provincial governments.

8 The actual grants available from the ecoENERGY Retrofit program were $500 for an ENERGY STAR® qualified gas furnace that has a 92.0% AFUE or better, and a DC variable-speed motor. A grant of $200 was offered for a replacement central air conditioner with an SER of 14.5 or higher. The Ontario Home Energy Savings program provided matching grants.

9 All recipients of Ontario Home Energy Savings grants should also have received federal ecoENERGY grants. We suspect that participants only chose one or the other.

10 As mentioned earlier, no gas utilities offered high-efficiency furnace rebates in 2010.

11 These reported values do not align with the actual incentives offered by these programs.
incentive values should be used with caution given the apparent mismatch between reported and actual incentives for different programs.

**Table 21 Participation in other air conditioner incentive programs**

<table>
<thead>
<tr>
<th>Other CAC rebate programs</th>
<th>Participation in other programs</th>
<th>Average value (reported)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal ecoENERGY rebate</td>
<td>50%</td>
<td>$1,424</td>
</tr>
<tr>
<td>Ontario Home Energy Savings Program</td>
<td>68%</td>
<td>$1,067</td>
</tr>
<tr>
<td>Manufacturer rebate</td>
<td>27%</td>
<td>$481</td>
</tr>
<tr>
<td>Discount from contractor</td>
<td>13%</td>
<td>$478</td>
</tr>
<tr>
<td>Other rebate or tax credit</td>
<td>2%</td>
<td>Base too small</td>
</tr>
<tr>
<td><strong>All / any other rebate</strong></td>
<td><strong>84%</strong></td>
<td><strong>n/a</strong></td>
</tr>
</tbody>
</table>

**Table 22 Participation in other furnace incentive programs**

<table>
<thead>
<tr>
<th>Other Furnace rebates</th>
<th>Participation in other programs</th>
<th>Average value (reported)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal ecoENERGY rebate</td>
<td>57%</td>
<td>$1,247</td>
</tr>
<tr>
<td>Ontario Home Energy Savings Program</td>
<td>75%</td>
<td>$1,012</td>
</tr>
<tr>
<td>Manufacturer rebate</td>
<td>22%</td>
<td>$421</td>
</tr>
<tr>
<td>Discount from contractor</td>
<td>10%</td>
<td>$385</td>
</tr>
<tr>
<td>Federal tax credit</td>
<td>10%</td>
<td>n/a</td>
</tr>
<tr>
<td>Gas utility rebate</td>
<td>5%</td>
<td>$132</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>Base too small</td>
</tr>
<tr>
<td><strong>All / any other rebate</strong></td>
<td><strong>91%</strong></td>
<td><strong>n/a</strong></td>
</tr>
</tbody>
</table>

Contractors’ estimates of their customers’ participation in other incentive programs are well aligned with the results of the participant survey. The most notable difference is that contractors believed that participation in the ecoENERGY program exceeded participation in the OHESP, while customers reported the opposite. This relative alignment is a notable change from 2009, when contractors reports of participation in the ecoENERGY programs greatly exceeded those of their customers.

Based on the contractor survey results, approximately half of
contractors believe that their customers “usually” receive incentives from the ecoENERGY program, and approximately one quarter believe that their customers “sometimes” participate in this program. Unlike customers, contractors estimate lower participation in the OHESP; 30-32% of contractors estimate that their customers “usually” receive OHESP incentives, and another 25-28% said that customers “sometimes” receive OHESP incentives.

Many contractors believed that gas utilities offered furnace programs, with 17% suggesting that customers “usually” receive these incentives. This high estimate suggests that contractors may not be fully aware of the changes in other incentive programs from year-to-year, given that utilities did not report offering any furnace rebates in 2010. Finally, 28-29% of contractors reported that their customers “usually” receive manufacturer incentives.

Levels of influence

Survey participants identified the CSRP as a highly influential factor in their purchasing decisions. As illustrated in Table 23, 51% of CAC purchasers and 46% of ECM furnace purchasers reported that they were strongly influenced by the Cool Savings Rebate Program. Only 6% of air conditioning purchasers and 8% of furnace purchasers reported that they were not influenced at all.

<table>
<thead>
<tr>
<th></th>
<th>Strongly influenced</th>
<th>Somewhat influenced</th>
<th>Weakly influenced</th>
<th>Not at all influenced</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSRP – CAC</td>
<td>51%</td>
<td>33%</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>CSRP – ECM Furnace</td>
<td>46%</td>
<td>33%</td>
<td>12%</td>
<td>8%</td>
</tr>
</tbody>
</table>

The CSRP was also reported as very influential relative to other financial incentive programs, as illustrated in Table 24.

For both air conditioners and furnaces, the CSRP was rated as the most important program that influenced their purchasing decisions. The ecoENERGY rebate was only strongly influential for 32% of those who received a CSRP rebate for an ENERGY STAR® air conditioner. Manufacturer rebate offers strongly influenced 9% of respondents, and contractor discounts were rated as influential by an even lower number. For ECM furnace purchasers, the ecoENERGY rebate was strongly influential for a slightly larger 34% of all survey respondents. Manufacturer rebates and contractors discounts strongly influenced 7% and 3%, respectively.
Table 24 Reported influence of programs (population of participant survey respondents)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Strongly influenced -CAC purchases</th>
<th>Strongly influenced -ECM furnace purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSRP</td>
<td>51%</td>
<td>46%</td>
</tr>
<tr>
<td>Federal ecoENERGY rebate</td>
<td>32%</td>
<td>34%</td>
</tr>
<tr>
<td>Manufacturer rebate</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Discount from contractor</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

When asked to identify the most influential factor among those that “strongly influenced” their purchasing decisions, the CSRP was also the top incentive program. 10% of all survey respondents selected the CSRP as the most important of the factors that “strongly influenced” their CAC purchase decision. Only 5% of all survey respondents identified the federal ecoENERGY program as most influential. However, a large number of respondents (31%) indicated that two or more factors had an equally strong influence on their decisions. For ECM furnaces, 7% of participants identified the CSRP as the most important factor that “strongly influenced” their decision. Another 5% selected federal ecoENERGY rebates. A significant 27% indicated that two or more factors had an equally strong influence on their decisions.

However, the federal ecoENERGY program appears to be more influential than the CSRP when considering only the subsample of survey respondents who actually participated in the ecoENERGY program. As illustrated in Table 25, 64% of respondents who had received ecoENERGY rebates for CACs identified the program as “strongly influential.” Similarly, 60% of respondents who had received ecoENERGY rebates for ECM furnaces identified them as strongly influential. This may be due to the high financial value of the ecoENERGY rebates and accompanying OHESP rebates.

Manufacturer and contractor rebates remained far less influential than the CSRP offer, even when only considering the subsample that received these incentives. Only 31-33% of those who received manufacturer rebates described them as strongly influential. In part, this may reflect their lower rebate value relative to other programs; however, participants reported them as being substantial in value (with averages of $385-$481). It may also reflect the consumer view that manufacturers are not interested in saving their customers’ money or energy. Consumers may not trust that manufacturer discounts provide “true” savings (particularly given that rebates are more common for high-end products that may be seen as having larger profit margins). In addition, participants who are very interested in saving energy\(^{12}\) may not trust that manufacturers are interested in

---

\(^{12}\) See Participant attitudes for more details.
saving energy. This is particularly likely given that manufacturer incentives are generally categorized based on product level (e.g. top tier vs. mid tier) rather than by energy efficiency. Similarly, only 26-33% of those who received discounts from contractors described them as “strongly influential.”

The manufacturers interviewed for the report also emphasized the importance of the CSRP and other government programs to increase awareness – in a way that their promotional programs cannot.

Table 25 Reported influence of programs (subsample of participants in relevant programs)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Strongly influenced CAC purchase decisions</th>
<th>Strongly influenced ECM furnace decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal ecoENERGY rebate</td>
<td>64%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>CSRP</strong></td>
<td><strong>51%</strong></td>
<td><strong>46%</strong></td>
</tr>
<tr>
<td>Manufacturer rebate</td>
<td>33%</td>
<td>31%</td>
</tr>
<tr>
<td>Discount from contractor</td>
<td>26%</td>
<td>33%</td>
</tr>
</tbody>
</table>

The results of the contractor survey also strongly support the importance of the CSRP relative to other incentive programs. As illustrated in Figure 1, 38% of contractors reported that customers most commonly came to them looking to purchase an ENERGY STAR® system because of the CSRP rebate. Another 23% reported that customers most commonly planned to buy a non-ENERGY STAR® system but were convinced otherwise by the CSRP rebate.

For ECM furnaces, contractors also estimated that the CSRP incentives were commonly a very influential factor. As illustrated in Figure 2, 35% of contractors said that customers most commonly came to them looking to purchase an ECM furnace system because of the CSRP rebate. Another 16% reported that customers most commonly planned to buy a non-ECM furnace but were convinced otherwise by the CSRP rebate.

These results also suggest that, relative to other programs, the CSRP is particularly influential for air conditioning systems. Only 14% of contractors reported that non-CSRP rebates were most commonly the influential factor in customers’ CAC purchasing decisions, as compared to 21% for ECM furnaces. These results are consistent with the participant survey and manufacturer interviews that both suggest that the CSRP offer is somewhat more influential for CACs than for ECM furnaces.

Manufacturers agreed that, in general, the sales of efficient CAC units, more than the sales of efficient furnaces, are dependent on rebate programs, as there is a small difference in operating costs between SEER 13 and 14.5 units, leading to a longer payback period.
Market trends

IndEco examined the furnace and CAC market through a review of furnace shipment data provided by HRAI, online surveys with contractors, and telephone surveys with five leading HVAC manufacturers.

Recent participation

IndEco examined a number of factors and their past impacts on the CSRP program in previous years to assist with the forecast of program participation for future years. These factors include economic conditions, participant attitudes, and market penetration and saturation information regarding ECM furnaces and efficient CACs.

13 The shipment data represents units which are shipped through Ontario, so the figures indicate units which merely pass through Ontario en route to another province and may not accurately reflect installations within Ontario.
Figure 3 below indicates the program participation for the three pieces of equipment included in the CSRP program from 2006-2010. Participant numbers slightly decreased in 2010 compared to 2009. In 2009, 173,036 CACs, ECM furnaces, and programmable thermostats were installed; in 2010 the total number was 136,626. The program participation was slightly lower than in 2009, but was higher than 2008 participation rates. As shown in Figure 4, the program rebate levels remained the same in 2010 as in 2009.

Figure 3 Number of CSRP participants, 2006-2010

Figure 4 CSRP rebate levels, 2006-2010

14 The 2006 numbers only reflect half a year, from October 2006 to March 2007.
Economic conditions

Economic conditions have an impact on consumers’ purchasing decisions for heating and cooling equipment. This type of equipment is a large expense for households, and before making such a large purchase consumers must consider a variety of factors, for example: the upfront cost, the impact on energy costs, whether any incentive programs are available, whether they have job security, and whether they plan to sell their home in the short-term.

According to Figure 3 above, program participation has been minimally affected by the economic downturn that began in late 2007. Participation rose steadily from 29,617 retrofits/installs for the program year of October 2006 to March 2007, to 102,540 in 2008, to 173,036 in 2009. In 2010 there was a decrease, to 136,626 retrofits/installs. This is a rather slight reduction in participation and is likely attributed to the simple fact that homeowners do not replace HVAC equipment until it is near the end of its useful life. In any given program year, the pool of possible furnace participants is primarily determined by the age of the equipment.

Participant attitudes

While incentives and incentive programs are a significant motivating factor for consumers’ purchasing decisions, there are also other factors at play when a consumer makes a heating or cooling equipment purchase. The participant survey indicates that age of previous equipment, monthly energy costs, environmental concerns, and the recommendation of a contractor are also important factors in the decision-making process. As illustrated in Figure 5 below, the most influential factors, behind age of equipment, in participants’ decisions to purchase their rebated new furnace, were impacts on monthly energy costs (56%), the CSRP offer (46%), the ecoENERGY offer (34%), the recommendation of the contractor (31%), and the impact on the environment (31%).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of previous equipment</td>
<td>66%</td>
</tr>
<tr>
<td>Monthly energy costs</td>
<td>56%</td>
</tr>
<tr>
<td>CSRP</td>
<td>46%</td>
</tr>
<tr>
<td>Federal eco-Energy rebate</td>
<td>34%</td>
</tr>
<tr>
<td>Contractor recommendation</td>
<td>31%</td>
</tr>
<tr>
<td>Environmental impact</td>
<td>31%</td>
</tr>
<tr>
<td>Information from personal research</td>
<td>28%</td>
</tr>
<tr>
<td>Manufacturer rebate</td>
<td>7%</td>
</tr>
<tr>
<td>Discount from contractor</td>
<td>3%</td>
</tr>
</tbody>
</table>

Figure 5 Factors that strongly influenced ECM furnace purchase decisions
The most influential factors in participants’ decisions to purchase their rebated ENERGY STAR® air conditioner were impacts on monthly energy costs (52%) and the CSRP offer (51%), followed by the impact on the environment (34%), the ecoENERGY offer (32%) and the recommendation of the contractor (32%).

Based on participant responses, the response of ‘impacts on monthly energy costs’ as a strongly influential factor for their purchase was significantly related (63% at 95% confidence level) to respondents with an annual household income level of $40,000-80,000 who purchased furnaces with ECMs. For the purchase of air conditioners, the CSRP offer as a strongly influential factor was significantly related (61% at 95% confidence level) to respondents with an annual household income level of <$40,000. This suggests that the CSRP offer is more of a critical factor in making purchasing decisions for participants in the lower income brackets. Figure 7 demonstrates this relationship for air conditioning systems. In addition, this may suggest that the incentive offer is too low to be a major driver for purchasing decisions for many households in the highest income bracket.
According to the participant surveys, 35% of respondents indicated that conserving energy has been extremely important to them over the past five years; this response was significantly related to annual household income, as 85% of respondents in the <$40,000 category gave this response. Conserving energy has been very important to 43% of respondents, and has been somewhat important to 19% of respondents. These results are illustrated in Figure 8.

When making purchases that affected energy use, 27% of respondents paid more for an energy efficient option all of the time, while 54% of respondents paid more for an energy efficient option most of the time. These results are illustrated in Figure 9.

Figure 8 Importance of energy conservation to CSRP participants
All of these data suggest that rebate offers (such as from the CSRP) are important factors in consumers’ equipment purchase decision-making. In addition, many consumers report that they care about the energy impacts of their purchases, and many conduct their own research prior to making a purchase decision. It is also evident that there is a high level of trust between consumers and their contractors, as the contractor’s recommendation is a very influential purchase factor. The relationship between the contractors and consumers is a critical factor in the participation rates of the program.

*Market penetration of furnaces with ECMs*

IndEco asked HVAC contractors to estimate if the number of installations of furnaces with an ECM increased, remained about the same, or decreased in 2010 over 2009. The contractors indicated that the installation of furnaces with an ECM increased. In the survey, 70% of contractors said they were installing more ECM furnaces in residences than in 2009; this result was significantly related (89% at 95% confidence level) to contractors in the GTA. Another 26% of contractors stated they were installing approximately the same number of ECM furnaces in residences, and 4% were installing fewer units than in 2009. These results are illustrated in Figure 10 below.
The survey also tracked the contractors’ estimated sales from 2006 to 2010. Installations of furnace units increased substantially from 2006-2009, and this upward trend continued in 2010, as can be seen in Table 26 below.

**Figure 10 Change in installation of ECM furnaces in residences, 2010 over 2009**

<table>
<thead>
<tr>
<th>Year</th>
<th>Furnace units installed in residences (Avg.)</th>
<th>Furnace units with ECMs installed in residences (Avg.)</th>
<th>“Residential-type” furnace units installed in businesses (Avg.)</th>
<th>“Residential-type” furnace units with ECMs installed in businesses (Avg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>74</td>
<td>39</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>2007</td>
<td>93</td>
<td>42</td>
<td>19</td>
<td>16</td>
</tr>
<tr>
<td>2008</td>
<td>105</td>
<td>64</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>2009</td>
<td>113</td>
<td>79</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>2010</td>
<td>142</td>
<td>79</td>
<td>40</td>
<td>25</td>
</tr>
</tbody>
</table>

The greatest increases are in the average number of furnaces without ECMs in residences. There was no change in the average number of furnaces with ECMs installed in residences. The average number of residential-type furnaces installed in businesses increased in 2010. There was no significant increase in the average number of furnace installs with an ECM. Contractors were asked whether the proportion of residential-type furnaces they installed in residences and in businesses changed from 2009 to 2010. Most contractors (59%)
responded that the proportion remained about the same, while 33% responded that the proportion increased; this response was significantly related (67% at 95% confidence level) to contractors in the GTA. This survey response is consistent with the average install data.

Contractors’ indications of furnace ‘replacement vs. repair’ frequency also provide evidence for a growing furnace replacement market. Respondents to the contractor survey indicated that when called to service a furnace that was over 10 years old, on average, the proportion of customers replacing systems increased slightly from 38% in 2009 to 40% in 2010. On average, the proportion of customers repairing systems decreased slightly from 62% in 2009 to 58% in 2010. There is no indication that customers’ financial situations are driving them to opt for repairs over replacements.

These trends are supported by the Ontario furnace shipment information provided by HRAI, as well as by the anecdotal information gathered from telephone surveys with the top HVAC contractors. As seen in Table 27 below, an increasing percentage of shipped furnaces are equipped with an ECM. In 2006, just 28% of the total Ontario furnace shipments were furnaces with an ECM. This percentage increased to 34% and 36% in 2007 and 2008. In 2009 and 2010, over half (60% and 57%, respectively) of the total units were equipped with an ECM.

<table>
<thead>
<tr>
<th>Table 27 Ontario furnace shipment information provided by HRAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Ontario furnace shipment</td>
</tr>
<tr>
<td>Percentage of total Ontario CAC shipment with ECM</td>
</tr>
<tr>
<td>Percentage of total Ontario CAC shipment installed in new home construction(^{15})</td>
</tr>
</tbody>
</table>

All manufacturers surveyed agreed that there is an upward trend in the number of furnaces equipped with an ECM being sold in the marketplace. The manufacturers estimated that approximately 60-90% of all furnace retrofits are now those that have an ECM. The eco\textregistered ENERGY and OPA programs largely drive this demand. It was noted by several manufacturers that once the payback calculations are presented to customers, they typically choose to install the more efficient ECM models.

From a 2009 survey of HVAC contractors by HRAI, the incremental cost to a homeowner, on average, to replace an existing forced-air gas furnace with an 80,000 BTU mid-efficiency gas furnace with an

\(^{15}\) Proportion of 65% of total. Assumption provided by OPA.
ECM, as opposed to one without an ECM, is $1,225. Similarly, the incremental cost to a homeowner, on average, to replace an existing forced-air gas furnace with an 80,000 BTU high-efficiency gas furnace with an ECM, as opposed to one without an ECM, is $1,203, or nearly double. With such a significant price difference between furnaces with and without an ECM, it is no surprise that financial incentives offered to help offset the price of furnaces with an ECM continue to be an important purchase decision factor. Manufacturers assert that the increase in sales of furnaces with an ECM will be partially dependent on the continuation of programs that offer rebates; customers’ purchasing decisions are strongly driven by program incentives.

Manufacturers also noted that the percentage of furnaces with an ECM that are being installed in the new construction market are significantly lower, as new home builders tend to install the least-cost models. The HRAI survey indicated that in 2010, 12% of all residential installations were in new construction, 13% were new installations in existing homes, and 75% were replacements. This finding is not consistent with the Ontario furnace shipment information percentage of new home installation assumption provided by the OPA, that is, that 65% of all furnace installations occur in new home construction. The HRAI survey indicates a much higher percentage of furnaces are installed as replacements.

Contractors were asked whether they anticipate any changes in the demand for replacement furnace installations in 2011. Of the contractors surveyed, most (51%) indicated that they expect a small to moderate increase in demand for replacements, while 8% of contractors expect a large increase in demand. These results are illustrated in Figure 11 below.
Market penetration of ENERGY STAR® CACs

IndEco asked HVAC contractors to estimate if their sales of residential-type (e.g. split system 5 tonnes or under) AC systems installed in residences and businesses increased, remained about the same, or decreased in 2010 over 2009. The contractors indicated that the sale of residential-type AC systems in 2010 increased over 2009 levels. In the survey, 52% of contractors said they were installing more residential type AC systems in 2010 than in 2009. Another 36% stated they were installing approximately the same number of residential-type AC systems, and 13% were installing fewer units than in 2009. These results are illustrated in Figure 12 below.

![Figure 12 Total number of AC units (regardless of type) installed by surveyed contractors in 2010 compared to 2009](image)

According to 58% of contractors, the number of ENERGY STAR® qualified residential-type AC units installed in businesses increased in 2010 from 2009, from 20% to 29% on average.

Table 28 Average number of air conditioners installed by surveyed contractors

<table>
<thead>
<tr>
<th>Year</th>
<th>CAC systems installed in residences (Avg.)</th>
<th>ENERGY STAR® qualified CAC systems installed in residences (Avg.)</th>
<th>“Residential-type” CAC systems installed in businesses (Avg.)</th>
<th>“Residential-type” ENERGY STAR® qualified CAC systems installed in businesses (Avg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>65</td>
<td>36</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>2007</td>
<td>69</td>
<td>36</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>2008</td>
<td>74</td>
<td>44</td>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>2009</td>
<td>75</td>
<td>49</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>2010</td>
<td>99</td>
<td>58</td>
<td>32</td>
<td>29</td>
</tr>
</tbody>
</table>
Respondents to the contractor survey indicated that when called to service an air conditioning system that was greater than 10 years old, on average, the proportion of customers replacing systems remained about the same, with 47% in 2009 and 46% in 2010. The average number of CAC repairs also remained the same, at 48%. The average number of CAC systems left non-functioning also remained about the same, with 5% in 2009 and 6% in 2010. These results are illustrated in Figure 13 below. The percentage of residential installations as replacement of existing systems was 63% in 2010.

![Figure 13 Result of CAC service calls in 2010](image)

The survey also asked contractors to anticipate future demand for replacement AC installations in 2011. 46% of contractors anticipate a small to moderate increase in demand, while 22% anticipate no change in demand. These results are illustrated in Figure 14 below.
The CAC shipment information provided by HRAI is not broken down by SEER or EER ratings. However, as seen in Table 29 below, from 2006-2009 there was a trend of an increasing percentage, with a marginal decline in 2010, of the total Ontario CAC shipment that received a rebate and was installed as a retrofit.

Table 29 Ontario CAC shipment information provided by HRAI

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario CAC shipment</td>
<td>157401</td>
<td>130625</td>
<td>124683</td>
<td>113748</td>
<td>138396</td>
</tr>
<tr>
<td>Percentage of total Ontario</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAC shipment that received</td>
<td>10%</td>
<td>19%</td>
<td>19%</td>
<td>35%</td>
<td>25%</td>
</tr>
<tr>
<td>rebate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of total Ontario</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAC shipment installed as</td>
<td>15%</td>
<td>29%</td>
<td>32%</td>
<td>48%</td>
<td>35%</td>
</tr>
<tr>
<td>retrofit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of total Ontario</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAC shipment installed in</td>
<td>30%</td>
<td>33%</td>
<td>40%</td>
<td>27%</td>
<td>28%</td>
</tr>
<tr>
<td>new home construction(^\text{16})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manufacturers commented that while there is an upward trend in the percentage of air conditioners sold in Ontario with a SEER rating of

---

\(^{16}\) Proportion of 65% of total. Assumption provided by OPA.
14.5 or 15, consumers have not been as responsive to energy efficient CACs as they have been to furnaces.

Manufacturers estimate that when the ecoENERGY program ended in March 2011, sales of SEER 14.5 and 15 CACs dropped to around 40% of total CAC sales in Ontario, as many consumers purchased units with a SEER rating of 13. The sales of SEER 14.5 and 15 CACs have now rebounded to about 50-60% of total sales. The specific reason(s) for this rebound are unknown.

Data from participant surveys and from manufacturer interviews both indicate that rising energy costs are a significant motivating factor in customers’ purchasing decisions, and that rebate programs contribute to the affordability of energy efficient units. When 2010 program participants were asked what the factors were that influenced their purchasing decisions, 52% of respondents indicated that the impact on monthly energy costs strongly influenced their purchase, while 51% indicated that the CSRP offer strongly influenced their purchase. Manufacturers also described both the availability of government programs and the cost of energy as an important factor that influences the market penetration of energy-efficient products from province to province.

From the 2009 HRAI survey conducted with HVAC contractors, the cost to a homeowner, on average, to replace an existing CAC system with a new 2-ton system that meets minimum requirements (13.0 SEER/10.5 EER), and assuming limited sheet metal work and a drain is available and the outdoor unit is within 20 feet of the indoor unit, is $2,523. To replace an existing CAC system in the same scenario with a SEER 14.5 unit would be an additional $684. To replace an existing CAC system in the same scenario with a SEER 15 unit would be an additional $1351. Some manufacturers noted that because the total annual operating hours of an air conditioner are not as high as those of a furnace (approximately $100/year for air conditioning), consumers are unwilling to accept the extra upfront cost of the equipment.

**Market saturation of ECM furnaces and ENERGY STAR® CACs**

Since the age of existing equipment is one of the strongest influencers on the purchasing decisions of participants in the CSRP, the markets for ECM furnaces and CACs do not operate in the same manner as markets where measures are switched out on a regular basis, such as with light bulbs. Over any period of a few years, it is the subset of Ontarians with aging furnaces or CAC systems that are ultimately interested in the incentives offered by the CSRP. Those with functional furnaces and CACs will not likely be interested in upgrading. As such, the markets for ECM furnaces and CAC do not reach saturation in a traditional sense. It is unlikely that the CSRP will experience a period of high uptake over a few years followed by years of slow decrease in participation; every few years, a new subset of Ontarians will become interested in the program.

---

57 See Participant attitudes for more details.
Analyzing the point in a furnace or CAC’s life at which it becomes financially beneficial to replace the equipment strengthens this finding. Based on the Participant Cost (PC) test, it only begins to become financially beneficial to a participant to replace a furnace after it has operated for at least 8 years. This is based on the incentive and the bill savings over eight years being equal to the incremental equipment cost of purchasing a furnace with an ECM motor versus a base model furnace. This is shown in Table 30 and Figure 15 below.

Table 30 Net participant cost test benefits associated with replacing a furnace after 1 to 18 years

<table>
<thead>
<tr>
<th>Years until the furnace is replaced</th>
<th>Total net bill savings and incentive value</th>
<th>Net incremental equipment cost</th>
<th>Net PC benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$158</td>
<td>$383</td>
<td>($224.82)</td>
</tr>
<tr>
<td>2</td>
<td>$190</td>
<td>$383</td>
<td>($192.69)</td>
</tr>
<tr>
<td>3</td>
<td>$223</td>
<td>$383</td>
<td>($160.21)</td>
</tr>
<tr>
<td>4</td>
<td>$255</td>
<td>$383</td>
<td>($127.66)</td>
</tr>
<tr>
<td>5</td>
<td>$287</td>
<td>$383</td>
<td>($96.05)</td>
</tr>
<tr>
<td>6</td>
<td>$319</td>
<td>$383</td>
<td>($63.74)</td>
</tr>
<tr>
<td>7</td>
<td>$350</td>
<td>$383</td>
<td>($32.65)</td>
</tr>
<tr>
<td>8</td>
<td>$380</td>
<td>$383</td>
<td>($2.54)</td>
</tr>
<tr>
<td>9</td>
<td>$409</td>
<td>$383</td>
<td>$26.60</td>
</tr>
<tr>
<td>10</td>
<td>$438</td>
<td>$383</td>
<td>$55.20</td>
</tr>
<tr>
<td>11</td>
<td>$466</td>
<td>$383</td>
<td>$82.99</td>
</tr>
<tr>
<td>12</td>
<td>$491</td>
<td>$383</td>
<td>$108.31</td>
</tr>
<tr>
<td>13</td>
<td>$515</td>
<td>$383</td>
<td>$132.25</td>
</tr>
<tr>
<td>14</td>
<td>$538</td>
<td>$383</td>
<td>$155.02</td>
</tr>
<tr>
<td>15</td>
<td>$560</td>
<td>$383</td>
<td>$176.95</td>
</tr>
<tr>
<td>16</td>
<td>$581</td>
<td>$383</td>
<td>$198.03</td>
</tr>
<tr>
<td>17</td>
<td>$601</td>
<td>$383</td>
<td>$218.59</td>
</tr>
<tr>
<td>18</td>
<td>$621</td>
<td>$383</td>
<td>$238.52</td>
</tr>
</tbody>
</table>
A similar analysis has found that there would be no financial benefit from replacing a 15 SEER ENERGY STAR® CAC until the existing CAC system has reached its expected operational lifetime of 18 years. For a 14.5 SEER ENERGY STAR® CACs, there would be no financial benefit until the existing CAC system has reached well beyond its expected operational lifetime. The implication of this analysis is that it is unlikely that the CSRP will be targeting the same group of people until a bare minimum of 8 years have passed for ECM furnaces, and a bare minimum of 15-plus years have passed for CAC systems.

The total number of installed furnaces in Ontario, as reported in Statistics Canada 2007 Household Energy Use Survey suggests that the market for ECM furnaces is far from reaching any sort of saturation. There are roughly 3,000,000 Ontario households that use natural gas as the main source of heating. If the assumption was made that the rate of construction of these households was relatively consistent from year-to-year, and that a furnace tends to be replaced at the end of its equipment life (18 years), then it would be expected that on average 1/18th, or about 160,000 households would be in the market for a new furnace in any given year. Over the past two years, the CSRP has therefore only replaced roughly 40% of potential ECM furnaces. This indicates that future roll-outs of the CSRP will continue to target a large potential market and that the CSRP has room to grow the number of ECM furnaces that could be installed through participation in the program.

Figure 15 The financial benefit of replacing a furnace at a given furnace life

---

Effectiveness of marketing efforts

This section discusses the effectiveness of print, online and radio marketing campaigns by analyzing the number of rebates before and after these campaigns. It also highlights the apparent role of contractors as a source of information about the CSRP. Most program participants heard about the CSRP program from their contractor.

Print, Online and Radio Campaigns

Print, on-line and radio marketing campaigns were released for the 2010 CSRP at the end of May. To determine the impacts of these marketing efforts, IndEco analyzed the installation dates for ECM furnaces, ENERGY STAR® CACs and programmable thermostats for any increase in uptake directly after the marketing campaigns. Figure 16 provides the number of unique CAC, programmable thermostat and ECM furnace rebates by installation date.\(^\text{19}\)

![Figure 16 The number of rebates by installation date](image)

Figure 16 depicts unique rebates only. That is, it depicts participants that received rebates for only a single measure type. This subset was used to examine the month-to-month uptake trends, which would likely differ depending on the type of measure.

It is clear from Figure 16 that a spike in program uptake occurred in June. While this could be attributed to the marketing that was done at the end of May, the likelihood of a measure being installed in June must be also be considered. For ENERGY STAR® CACs, a summer install is far more likely than a winter install since CACs are used only in the summer months. For programmable thermostats, spikes in

\(^{19}\) January data were not included. The 2010 CSRP database shows a disproportionately large number of records recorded as being installed in January even though that was not likely the case.
uptake would be likely in both the summer and the winter since programmable thermostats can be used to control both heating and cooling systems. For ECM furnaces, a spike in winter would be reasonable and this is indeed seen. However, the spike in June makes less sense for ECM furnace installs since furnaces are used in the winter months. It is reasonable to assume that this significant June spike is due to the late-May marketing efforts.

To further estimate the impacts of the May marketing efforts, IndEco attempted to examine the number of additional participants that took part in the 2010 CSRP as a result of this marketing. Figure 17 shows what June installs might have looked like in the absence of the marketing, based on the trends in surrounding months.

![Figure 17 The number of rebates by installation date with the effects of marketing removed for ECM furnaces](image)

Based on the trends in surrounding months, 690 participants would have uniquely installed an ECM furnace (i.e. would not have also installed an ENERGY STAR® CAC or a programmable thermostat) in June had May marketing efforts not existed. The 2010 CSRP tracking database indicates that June saw 1,243 participants uniquely install an ECM furnace. Therefore, marketing can be estimated to have increased uptake for unique ECM furnaces by 80% in that month. This same linear extrapolation was done to both the unique ENERGY STAR® CAC installs and the unique programmable thermostat installs to see if this same percentage increase is also seen. Table 31 presents the results.
Table 31 Estimated percentage increase in uptake from May marketing efforts

<table>
<thead>
<tr>
<th></th>
<th>June installs as reported</th>
<th>June installs estimated from a linear May to July extrapolation</th>
<th>Estimated percentage increase due to marketing efforts</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECM furnaces</td>
<td>1,243</td>
<td>690</td>
<td>80%</td>
</tr>
<tr>
<td>ENERGY STAR® CAC</td>
<td>2,493</td>
<td>1,516</td>
<td>64%</td>
</tr>
<tr>
<td>Pstats</td>
<td>236</td>
<td>127</td>
<td>86%</td>
</tr>
</tbody>
</table>

Average estimated percentage increase from marketing efforts: 77%

Table 31 shows that the estimated percentage increase in June uptake due to May marketing efforts is roughly the same for each measure, with an average percentage increase in uptake of 77% for one month. A total of 10,452 installs occurred in June (including participants that also received more than one rebate.) The findings of this marketing impact would thus estimate that 77% of these installs, or 8,028 participants resulted from the May marketing efforts.

Ultimately, IndEco cannot be sure if these are new participants or if the marketing just pushed participants into participating earlier in the year instead of later. In any event, this estimated marketing impact agrees well with the results of the participant survey, which indicates that 8,772 participants heard about the 2010 CSRP from one of either newspaper, online or radio ads.

The participant uptake due to marketing efforts should be contrasted to the number of people that reported hearing about this program from a contractor. Based on the participant survey, 65% of all 71,431 participants, or 46,430 participants, heard about this program from their contractor. From this, it can be concluded that while mass marketing efforts do have an impact on participant uptake, contractors remain the most effective method of getting the message out to potential participants.

**Contractor influence**

Most program participants heard about the CSRP program from their contractor. Based on the participant survey, 65% of respondents heard about the program this way, followed by 19% of respondents who heard about the program from family and friends. To complement this finding, the majority of contractors reported that participants were only ‘somewhat familiar’ or ‘not very familiar’ with the CSRP program, as shown in Figure 18 and Figure 19.
Furthermore, since equipment age is such an influential factor in participants’ decision-making, contractors are likely to be a first and primary source of information on equipment purchase / replacement.

Future rollouts of the CSRP should take care to ensure that contractors are well versed in the program and offer appropriate advice to participants on equipment selection and energy efficient operation of the equipment.

There are some notable areas where contractor advice can prove beneficial to the participant and to the success of the CSRP. For

20 See Participant attitudes for more details.
instance, for both CAC and ECM furnace installs, heat load modeling
can be used to gauge the correct equipment size. While 74% of CAC
contractors stated that they used heat load modeling among other
things when determining the appropriate size of CAC unit, a full 28%
simply matched the existing unit size.

At a minimum, they should be encouraged not to simply select the
appropriate size of ENERGY STAR® CAC unit on the size of the
existing model which itself may not have been appropriately sized,
and particularly where homeowners have adopted energy efficiency
measures. The equivalent recommendation goes for ECM furnace
sizing, where 76% of ECM contractors claim to use some form of heat
loss modeling but a full 22% simply match the existing size and 17%
select a size based on a rule of thumb and the house floor area.

Given the importance of heat-loss modeling to achieving energy
savings, the OPA may wish to provide additional support or education
to contractors in this technique. This might involve developing new
resources or connecting contractors to existing programs and
resources.

In addition, the OPA could increase the use of heat-loss modeling by
requiring that contractors attach heat loss-gain calculations to CSRP
application forms. Contractors would feel greater pressure to
regularly perform these calculations to adequate standards. The OPA
would be able to use the data from heat loss-gain calculations if
needed. The tradeoff to greater savings brought on by the use of heat-
loss modeling could be that fewer contractors would participate in the
program.

Contractors can also influence how participants use their new
ENERGY STAR® CAC or ECM furnace. For CAC systems, contractors
can simply suggest that participants increase their CAC thermostats to
a slightly warmer setting. According to the participant survey, of the
55% of participants that reported a change in CAC thermostat setting,
81% raised the temperature an average of 2 degrees Celsius warmer.
Any influence from the contractor can contribute to a further
percentage of participants turning their thermostat up, leading to
additional energy and bill savings.

For ECM furnaces, contractors can be encouraged to recommend
non-continuous furnace fans settings to CSRP participants. In 2010,
there was a net shift of 5.6% of participants that switched their ECM
furnace fan usage from a continuous setting to a non-continuous or
‘auto’ setting. This is reasonable since 54% of participants reported
that their contractor recommended a switch to non-continuous mode.
Interestingly, 56% and 44% of contractors claimed to have
recommended participants to set their fan settings to continuous for
summer and winter months, respectively.

**Driving measure for participants installing more than one measure**

To examine the driving measure for participants that install both an ECM
furnace and an ENERGY STAR® CAC, the number of participants who
installed only one of the measures over the course of the 2010 CSRP was first examined. This is shown in Figure 20.

Figure 20 Participants who installed either an ECM furnace or a CAC, but not both

Figure 20 shows that CACs are most often installed between the months of April and August, inclusive, and ECM furnaces are more likely to be installed between the months of September and March. It was therefore assumed that the driving measure would be CACs between April and August, and ECM furnaces between September and March.

Table 32 shows the number of participants that have installed both an ECM furnace and a CAC system. Participants were included regardless of whether or not they also installed a programmable thermostat.

21 Recall that the spike in ECM furnaces that occurs in June is likely attributed to marketing efforts. See the Effectiveness of Marketing Efforts section (p. 49).
Table 32 Number of installs by month for participants that have installed both an ECM furnace and a CAC

<table>
<thead>
<tr>
<th>Installation month</th>
<th>Participants who installed both an ECM furnace and a CAC</th>
<th>Those driven by the ECM furnace install</th>
<th>Those driven by the CAC install</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>3,629</td>
<td>3,629</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>1,308</td>
<td>1,308</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>1,554</td>
<td></td>
<td>1,554</td>
</tr>
<tr>
<td>April</td>
<td>1,832</td>
<td></td>
<td>1,832</td>
</tr>
<tr>
<td>May</td>
<td>2,149</td>
<td></td>
<td>2,149</td>
</tr>
<tr>
<td>June</td>
<td>2,159</td>
<td></td>
<td>2,159</td>
</tr>
<tr>
<td>July</td>
<td>2,169</td>
<td></td>
<td>2,169</td>
</tr>
<tr>
<td>August</td>
<td>1,586</td>
<td></td>
<td>1,586</td>
</tr>
<tr>
<td>September</td>
<td>1,591</td>
<td></td>
<td>1,591</td>
</tr>
<tr>
<td>October</td>
<td>2,058</td>
<td></td>
<td>2,058</td>
</tr>
<tr>
<td>November</td>
<td>2,118</td>
<td></td>
<td>2,118</td>
</tr>
<tr>
<td>December</td>
<td>1,253</td>
<td></td>
<td>1,253</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23,406</strong></td>
<td><strong>11,957</strong></td>
<td><strong>11,449</strong></td>
</tr>
</tbody>
</table>

6 The number of installs in June was adjusted to remove the influence of the marketing effects occurring within that month. This was done with an extrapolation between May and July installation data.

The data suggests that 51% of participants who installed both measures were driven by an ECM furnace install and 49% of participants were driven by a CAC install.

There are almost 4 times as many participants that installed an ECM furnace but no CAC than vice versa. The fact that an equal number of participants were driven by a CAC install might suggest at first glance that the CAC is a stronger driving measure. However, a participant is likely to consider a working furnace as being of far more value than a working CAC. It is therefore perhaps less that the CAC is a stronger driving measure, and more the fact that a greater number of participants are likely to install an ECM furnace along with a summer install of a CAC than the number of participants that will opt to install a less necessary CAC along with a winter install of an ECM furnace.
Conclusions

The evaluation of the 2010 Cool Savings Rebate Program updated and expanded upon the 2009 evaluation in order to: estimate the gross and net energy savings and peak demand reductions achieved through the program; and assess market trends related to the use of furnaces with ECMs and ENERGY STAR® qualified CACs.

A trend analysis, participant forecast, and projected cost effectiveness test were performed. The report also discussed the factors that drive participants’ purchasing decisions, including the impact of complementary HVAC incentive programs and CRSP marketing efforts. Analysis of programmable thermostats was not included.

The report highlights a number of key findings, conclusions and recommendations that are presented in tabular form in the Executive Summary. There are three key findings from this evaluation.

First, the data indicate that the majority of participants replace their HVAC equipment because of the equipment’s age. Although monthly energy costs and rebate programs are also influential factors, the pool of potential participants is likely to be fairly stable over time with aging equipment. Thus, the OPA should not interpret a slight decrease in participation to indicate the onset of market saturation. Marketing efforts should be designed with these findings in mind. Also, there is potential for this program to continue for many years to come as the stock of furnaces and air conditioner is turned over.

Second, the data suggests that gross and net energy savings are largely tied to equipment sizing and operation. Although participant numbers declined in 2010 from 2009, calculated energy savings increased in 2010 over 2009 results largely because of the shift in furnace fan operation to non-continuous modes. Thus, the OPA should design program parameters to ensure that each rebate leads to the maximum energy savings. For example, it might introduce increased requirements as part of the application form.

Finally, contractors are a very important source of information about the CSRP, its measures, and ways to save energy from HVAC equipment repairs, replacements, and settings. Further, contractor sizing practices and operating advice play a major role in energy savings achieved through the program. These findings lead to us to recommend that the OPA evaluate how to better support, educate, and learn from the HVAC contractors in Ontario. As described in the report, this might entail providing support and/or education in heat loss-gain calculations. It might also involve providing contractors with information and/or incentives to ensure that they recommend appropriate equipment settings. We anticipate that contractors, customers and the OPA would benefit from an enhanced focus on contractors’ role in the CSRP.
Appendix A. Environics report on surveys conducted
COOL SAVINGS REBATE Program
Evaluation: Results of Participant and Contractor Surveys

July 29, 2011

Prepared for:
IndEco Strategic Consulting Inc.

336 MacLaren Street
Ottawa, ON K2P 0M6

pn 6967
# Table of Contents

- Introduction ........................................................................................................................................... 1
- Participant survey findings ......................................................................................................................... 5
- Contractor survey findings ......................................................................................................................... 14
Introduction

The COOL SAVINGS REBATE Program (CSRP) offers rebates to consumers for the purchase and installation of ENERGY STAR air conditioners, furnaces containing ECM fans and programmable thermostats. The Ontario Power Authority (OPA) commissioned IndEco Strategic Consulting to conduct an evaluation of the 2010 CSRP. Part of the evaluation is based upon information provided by program participants and by contractors. Environics was retained to conduct online surveys with each of these groups.

Participant survey: Methodology

The results of the Participant survey are based on an on-line survey with a sample of 1,158 individuals who received a COOL SAVINGS REBATE for their air conditioner, furnace and/or thermostat. The margin of sampling error for a sample of this size is plus or minus 2.7 percentage points, 19 times in 20.

Sample design. The source of the sample was the OPA participant database. A total of 69,591 records in the database had the status of “Cheque Cashed” or “Approved”, of which 16,491 had e-mail addresses (23.7%). Next, the e-mail sample was filtered to exclude contractors and individuals who had received rebates for more than one address (likely indicating that they do not live in the house where the rebated equipment was installed). A total of 3,492 e-mail addresses were removed at this stage. As a result, survey invitations were sent to a total of 12,999 e-mail addresses.

Quotas were set by postal code to ensure the final sample was representative of the OPA database by region:

<table>
<thead>
<tr>
<th></th>
<th>Participant database</th>
<th>Final sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Quota</td>
</tr>
<tr>
<td>Eastern Ontario (K)</td>
<td>16%</td>
<td>176</td>
</tr>
<tr>
<td>Central Ontario (L)</td>
<td>41%</td>
<td>451</td>
</tr>
<tr>
<td>Greater Toronto Area (M)</td>
<td>17%</td>
<td>187</td>
</tr>
<tr>
<td>Southern Ontario (N)</td>
<td>23%</td>
<td>253</td>
</tr>
<tr>
<td>Northern Ontario (P)</td>
<td>3%</td>
<td>33</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>1,100</td>
</tr>
</tbody>
</table>

The use of quotas ensured that no weighting by region was required at the analysis stage.

Questionnaire. The questionnaire used for this survey was based on the 2009 telephone questionnaire. Some questions removed and new questions added to address topics of current relevance to OPA, while the questions consistent with the 2009 survey were adjusted for an online format.

Survey administration. The survey was conducted by Environics using a secure, fully featured web-based survey environment according to the following steps:
• Environics programmed the questionnaire into survey software and hosted the survey on a secure server. A “beta test” link was used to review the survey on-line for final approval.

• Invitation e-mails were sent to a total of 12,999 participants. The e-mails included the URL link to the survey and a unique password.

• Technical support was provided to survey participants as required. Steps were taken to assure (and also guarantee) complete confidentiality and anonymity of survey responses.

• Environics electronically captured all survey responses as they were submitted, and created an electronic data file that was coded and analyzed (including open-ended responses).

The median length of time to complete a survey was 11.7 minutes. Each participant qualified for a draw for a cash prize as a thank you for their time.

The survey was launched on July 12, 2011. A reminder e-mail was sent on July 13 to those who had not yet completed the survey, and the survey was closed on July 18.

Survey accuracy. There are four notable areas of potential error in survey research:

• **Sampling error** is the calculated statistical imprecision due to interviewing a random sample instead of the entire population. The margin of error provides an estimate of how much the results of the sample may differ due to chance when compared to what would have been found if the entire population was interviewed. The margin of sampling error for a sample of 1,158 is plus or minus 2.7 percentage points, 19 times in 20. The margin of error is larger for subgroups of the total population (e.g., region, age).

• **Coverage error** is the result of not giving each member of the target population an equal chance of being included in the survey. This occurs when an individual’s email address is incorrect or when the individual is not reachable for the period of interviewing (e.g. is on vacation). One way to address this is to have as long a data collection period as possible, although this was not possible due to reporting deadlines for the research.

• **Measurement error** occurs when surveys do not measure what they are intended to measure. This type of error results from flaws in the instrument, question wording, translation issues, question order, timing, question response options, etc. Because the questionnaire built upon previous quantitative findings and carefully reviewed by OPA, IndEco and Environics, we believe this type of error was minimized.

• **Non-response error** occurs when individuals who do not respond to a survey are different, in ways relevant to the study, from those who did respond. The overall response rate for this study is 14 percent. This is fairly standard for online surveys drawn from a client database. In this case, the short field period available also limited the response rate.
The response rate is calculated as the number of responding participants (completed interviews, disqualifications and over-quota participants – 1,731), divided by unresolved e-mails (10,057) plus non-responding e-mails (501) plus responding participants (1,731). The disposition of the sample is presented in the table below:

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of sample units invited to participate</td>
<td>12,999</td>
</tr>
<tr>
<td>Invalid (undelivered)</td>
<td>710</td>
</tr>
<tr>
<td>Broadcasts delivered</td>
<td>12,289</td>
</tr>
<tr>
<td><strong>UNRESOLVED (U)</strong></td>
<td>10,057</td>
</tr>
<tr>
<td>Did not respond</td>
<td>10,057</td>
</tr>
<tr>
<td><strong>IN SCOPE NON-RESPONDING (IS)</strong></td>
<td>501</td>
</tr>
<tr>
<td>Qualified respondent break-off</td>
<td>501</td>
</tr>
<tr>
<td><strong>IN SCOPE RESPONDING (R)</strong></td>
<td>1,731</td>
</tr>
<tr>
<td>Disqualified</td>
<td>91</td>
</tr>
<tr>
<td>Quota filled</td>
<td>482</td>
</tr>
<tr>
<td>Completed</td>
<td>1,158</td>
</tr>
<tr>
<td><strong>CONTACT RATE [(R+IS)/(U + IS + R)]</strong></td>
<td>18%</td>
</tr>
<tr>
<td><strong>RESPONSE RATE [R / (U + IS + R)]</strong></td>
<td>14%</td>
</tr>
</tbody>
</table>

**Contractor survey: Methodology**

The results of the Contractor survey are based on an on-line survey with a sample of 177 contractors who promote the COOL SAVINGS REBATE program to their air conditioning and furnace customers. The margin of sampling error for a sample of this size is plus or minus 6.7 percentage points, 19 times in 20.

**Sample design.** The source of the sample was the OPA contractor database. There are a total of 976 records in the database, all of which has e-mail addresses. Survey invitations were sent to the entire sample of 976, with the goal of achieving 200 completed interviews.

However, the final sample size of 177 fell short of the desired goal. There are several potential reasons for this, including the timing of fieldwork (occurred during a heat wave, when contractors were likely very busy), the length of the survey (the median was 21 minutes, meaning that half the survey were in fact longer than this), the short field period available (dictated by the reporting deadline), and the limited amount of sample available.

Quotas were set by postal code to ensure the final sample was representative of the OPA database by region. The final (unweighted) sample under-represented contractors in the GTA and over-represented those in Southern Ontario. Thus, at the analysis stage, the data was weighted by region.
Questionnaire. The questionnaire used for this survey was based on the 2009 mail-out questionnaire. Some questions removed and new questions added to address topics of current relevance to OPA, while the questions consistent with the 2009 survey were adjusted for an on-line format.

Survey administration. The survey was conducted by Environics using identical steps to the Participant survey (described above). The median length of time to complete a survey was 21 minutes. Each participant was offered a $20 Home Depot gift certificate as a thank you for their time. The survey was launched on July 12, 2011. One reminder e-mail was sent on July 18 to those who had not yet started the survey, and one was sent on July 20 to those who had begun the survey but not yet completed it. The survey was closed on July 25.

Survey accuracy. The same four sources of error that apply to the Participant survey also apply to the Contractor survey (described above), including sampling error, coverage error, measurement error and non-response error.

The overall response rate for this study is 21 percent. The response rate is calculated as the number of responding participants (completed interviews, disqualifications and over-quota participants – 197), divided by unresolved e-mails (623) plus non-responding e-mails (139) plus responding participants (197). The disposition of the sample is presented in the table below:

<table>
<thead>
<tr>
<th></th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of sample units invited to participate</td>
<td>976</td>
</tr>
<tr>
<td>Invalid (undelivered)</td>
<td>17</td>
</tr>
<tr>
<td>Broadcasts delivered</td>
<td>959</td>
</tr>
<tr>
<td><strong>UNRESOLVED (U)</strong></td>
<td>623</td>
</tr>
<tr>
<td>Did not respond</td>
<td>623</td>
</tr>
<tr>
<td><strong>IN SCOPE NON-RESPONDING (IS)</strong></td>
<td>139</td>
</tr>
<tr>
<td>Qualified respondent break-off</td>
<td>139</td>
</tr>
<tr>
<td><strong>IN SCOPE RESPONDING (R)</strong></td>
<td>197</td>
</tr>
<tr>
<td>Disqualified</td>
<td>0</td>
</tr>
<tr>
<td>Quota filled</td>
<td>20</td>
</tr>
<tr>
<td>Completed</td>
<td>177</td>
</tr>
<tr>
<td><strong>CONTACT RATE [(R+IS)/(U+IS+R)]</strong></td>
<td><strong>35%</strong></td>
</tr>
<tr>
<td><strong>RESPONSE RATE [R / (U + IS + R)]</strong></td>
<td><strong>21%</strong></td>
</tr>
</tbody>
</table>
Participant Survey Findings

Source of CSRP Awareness

The majority of participants learned about the CSRP from their contractor.

CSRP participants were asked how they became aware of the rebate offer for energy efficient central air conditioners (CACs), furnaces and programmable thermostats. Contractors are by far the most common source by which participants heard about the rebate. Roughly two thirds of participants were told of the rebate by their contractor, for all three equipment types. Fewer learned about the CSRP from friends and family, newspaper or radio ads, the local electric utility, or the Internet. (Q.3/18/34)

### Source of CSRP Awareness

<table>
<thead>
<tr>
<th>Source of Awareness</th>
<th>CAC</th>
<th>Furnace</th>
<th>Thermostat</th>
</tr>
</thead>
<tbody>
<tr>
<td>From my contractor</td>
<td>65%</td>
<td>62%</td>
<td>68%</td>
</tr>
<tr>
<td>From family/friends</td>
<td>19%</td>
<td>16%</td>
<td>11%</td>
</tr>
<tr>
<td>Newspaper ad</td>
<td>16%</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>From my local utility</td>
<td>15%</td>
<td>13%</td>
<td>16%</td>
</tr>
<tr>
<td>On the Internet</td>
<td>14%</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>Radio ad</td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>8%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Don’t recall</td>
<td>5%</td>
<td>6%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Other Incentives

Most CSRP participants received additional incentives for their purchase, the most common being the Ontario Home Energy Savings Program rebate and the Federal ecoEnergy rebate.

The large majority of CSRP participants received additional incentives when they purchased energy efficient furnaces or air conditioners.

**Additional CAC incentives.** Among participants who received the COOL SAVINGS REBATE for the purchase of an ENERGY STAR air conditioner, more than eight in ten (84%) received at least one additional rebate or discount. Two-thirds (68%) report receiving the Ontario Government’s Home Energy Savings Program rebate, while half (50%) received the Federal ecoEnergy rebate. Other incentives include a rebate from the manufacturer (27%) or a discount from their contractor (13%). (Q.9)
### Additional CAC Incentive Received

<table>
<thead>
<tr>
<th></th>
<th>% of Respondents</th>
<th>Average rebate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any additional rebate</td>
<td>84%</td>
<td>N/A</td>
</tr>
<tr>
<td>The Ontario Home Energy Savings Program rebate</td>
<td>68%</td>
<td>$1066.80</td>
</tr>
<tr>
<td>The Federal ecoEnergy rebate</td>
<td>50%</td>
<td>$1424.42</td>
</tr>
<tr>
<td>A rebate from the equipment manufacturer</td>
<td>27%</td>
<td>$481.33</td>
</tr>
<tr>
<td>A discount from the contractor</td>
<td>13%</td>
<td>$478.47</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>BTS</td>
</tr>
</tbody>
</table>

BTS indicates base too small to report (n=16)

A majority of those who received additional rebates for their air conditioner indicated that they did not know the amount they received (ranging between 54% and 68% depending on the rebate type). Of those who knew how much they received, the Federal ecoEnergy program offered, on average, the highest rebate at over $1400.00. The Ontario Home Energy Savings Program provided an average rebate of over $1000.00 for an energy efficient CAC system. (Q.10)

### Additional furnace incentives

Among participants who received the COOL SAVINGS REBATE for a new furnace, nine in ten (91%) received at least one additional rebate, discount or tax credit with their purchase. Three quarters (75%) received the Ontario Home Energy Savings Program rebate and close to six in ten (57%) received the Federal ecoEnergy rebate. (Q.24)

### Additional Furnace Incentive Received

<table>
<thead>
<tr>
<th></th>
<th>% of Respondents</th>
<th>Average rebate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any additional rebate</td>
<td>91%</td>
<td>N/A</td>
</tr>
<tr>
<td>The Ontario Home Energy Savings Program rebate</td>
<td>75%</td>
<td>$1011.71</td>
</tr>
<tr>
<td>The Federal ecoEnergy rebate</td>
<td>57%</td>
<td>$1246.58</td>
</tr>
<tr>
<td>A rebate from the equipment manufacturer</td>
<td>22%</td>
<td>$421.23</td>
</tr>
<tr>
<td>A federal tax credit</td>
<td>10%</td>
<td>N/A</td>
</tr>
<tr>
<td>A discount from the contractor</td>
<td>10%</td>
<td>$385.00</td>
</tr>
<tr>
<td>A rebate from the gas utility</td>
<td>5%</td>
<td>$132.14</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>BTS</td>
</tr>
</tbody>
</table>

BTS indicates base too small to report (n=20)

Similar to air conditioner buyers, a majority of those who received additional furnace rebates indicated that they did not know how much they received (ranging between 62% and 71% depending on the rebate type). Of those who knew the amount, the Federal ecoEnergy program once again provided the largest rebate, with an average amount received of over
$1200.00. The Ontario Home Energy Savings Program rebate was on average $1000.00, while additional rebates or discounts from manufacturers and contractors were close to an average of $400.00 for a new, energy efficient furnace. (Q.25)

Influence on Purchasing Decisions

A variety of factors influence the decision to purchase an CAC or furnace, including the age of previous equipment, the impact on energy costs, and the COOL SAVINGS REBATE.

CAC, CSRP participants were provided with a list of factors that may have influenced their decision to purchase a CAC, and were asked to rate the extent of their influence (from "strongly influenced" to "not influenced at all").

The two factors rated as most influential are the impact on monthly energy costs (52% strongly influenced) and the COOL SAVINGS REBATE (51%). Close to three in ten each found the environmental impact (34%), the ecoEnergy rebate (32%), their contractor’s recommendation (32%) and their own personal research (31%) to be strongly influential, while two in ten each say the same about the initial purchase price (21%) and being able to find a replacement unit quickly (20%). Recommendations from family or friends (9%), and rebates from the manufacturer (9%) or contractor (3%) are considered to have had the least influence on their purchasing decision. (Q.15)

<table>
<thead>
<tr>
<th>Factors Influencing Purchase of CAC</th>
<th>% Strongly influenced</th>
</tr>
</thead>
<tbody>
<tr>
<td>The impacts on your monthly energy costs</td>
<td>52%</td>
</tr>
<tr>
<td>The COOL SAVINGS REBATE offer</td>
<td>51%</td>
</tr>
<tr>
<td>The impact on the environment</td>
<td>34%</td>
</tr>
<tr>
<td>The ecoEnergy rebate offer(\text{a})</td>
<td>32%</td>
</tr>
<tr>
<td>The recommendation of your contractor</td>
<td>32%</td>
</tr>
<tr>
<td>Information gathered from personal research</td>
<td>31%</td>
</tr>
<tr>
<td>The initial purchase price</td>
<td>21%</td>
</tr>
<tr>
<td>Being able to find a replacement unit quickly</td>
<td>20%</td>
</tr>
<tr>
<td>The recommendation of a friend or family member</td>
<td>9%</td>
</tr>
<tr>
<td>A rebate offer from the manufacturer(\text{b})</td>
<td>9%</td>
</tr>
<tr>
<td>A discount offer from your contractor(\text{c})</td>
<td>3%</td>
</tr>
</tbody>
</table>

\(\text{a}\) Asked only of those who received the ecoEnergy rebate (n=341)
\(\text{b}\) Asked only of those who received a manufacturer’s rebate (n=180)
\(\text{c}\) Asked only of those who received a rebate from their contractor (n=88)
When asked which of the factors was most important, the age of the previous furnace was the most common single response (17%), followed by the COOL SAVINGS REBATE (10%). Each of the remaining factors were chosen as most influential by between one and six percent of participants. A substantial minority said that two or more factors equally influenced their decision (31%) or did not select any of the available options (13%). (Q.16)

**Furnaces.** For CSRP participants who received a rebate for a new furnace, the factor rated as most influential to their purchase is the age of their previous furnace (66% strongly influenced), followed by the impact on monthly energy costs (56%).

Just under half (46%) say they were strongly influenced by the COOL SAVINGS REBATE, while close to three in ten each were influenced by the ecoEnergy rebate (34%), the environmental impact (31%), their contractor’s recommendation (31%) and their own personal research (28%). Fewer say the same about a gas utility rebate (26%), the initial purchase price (22%) or being able to find a replacement unit quickly (22%). As with CAC purchases, recommendations from family or friends (9%), and rebates from the manufacturer (7%) or contractor (3%) are considered to have had the least influence on their furnace purchasing decision. (Q.31)

### Factors Influencing Purchase of Furnace

<table>
<thead>
<tr>
<th>Factor</th>
<th>% Strongly influenced</th>
</tr>
</thead>
<tbody>
<tr>
<td>The age of previous equipment</td>
<td>66%</td>
</tr>
<tr>
<td>The impacts on your monthly energy costs</td>
<td>56%</td>
</tr>
<tr>
<td>The COOL SAVINGS REBATE offer</td>
<td>46%</td>
</tr>
<tr>
<td>The ecoEnergy rebate offer(^a)</td>
<td>34%</td>
</tr>
<tr>
<td>The impact on the environment</td>
<td>31%</td>
</tr>
<tr>
<td>The recommendation of your contractor</td>
<td>31%</td>
</tr>
<tr>
<td>Information gathered from personal research</td>
<td>28%</td>
</tr>
<tr>
<td>A rebate from your gas utility(^b)</td>
<td>26%</td>
</tr>
<tr>
<td>The initial purchase price</td>
<td>22%</td>
</tr>
<tr>
<td>Being able to find a replacement unit quickly</td>
<td>22%</td>
</tr>
<tr>
<td>The recommendation of a friend or family member</td>
<td>9%</td>
</tr>
<tr>
<td>A rebate offer from the manufacturer(^c)</td>
<td>7%</td>
</tr>
<tr>
<td>A discount offer from your contractor(^d)</td>
<td>3%</td>
</tr>
</tbody>
</table>

\(^a\) Asked only of those who received the ecoEnergy rebate (n=517)
\(^b\) Asked only of those who received a gas utility rebate (n=43)
\(^c\) Asked only of those who received a manufacturer’s rebate (n=199)
\(^d\) Asked only of those who received a rebate from their contractor (n=92)

When asked which of the factors was most important, the age of their previous furnace was the most common single
response (27%), followed by the impact on their monthly energy costs (14%). Seven percent said the COOL SAVINGS REBATE was the most influential factor, while each of the remaining factors were chosen as most influential by between one and five percent of participants. A substantial minority said that two or more factors equally influenced their decision (27%) or did not select any of the available options (6%). (Q.32)

**Free Ridership**

*The majority of CSRP participants say that if the rebate was not available it would have affected their decision to purchase a new CAC or furnace.*

To what extent would CSRP participants have purchased the same energy-efficient equipment if the rebate was not available? In fact, the majority say they would not have made the purchase they did without the CSRP.

Among those receiving a CAC rebate, one in three (34%) say they would have made the same purchase regardless of the rebate, but two thirds (66%) would have waited to make the same purchase later, not replaced the existing system, or chosen less expensive equipment. (Q.8)

Among those receiving a furnace rebate, four in ten (41%) would have made the same purchase, while the remaining six in ten (59%) would have waited, purchased something less expensive, or kept the current system. (Q.23)

<table>
<thead>
<tr>
<th>Likely action if CSRP was not available</th>
<th>CAC</th>
<th>Furnace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Made the same purchase</td>
<td>34%</td>
<td>41%</td>
</tr>
<tr>
<td>Net other purchase options</td>
<td>66%</td>
<td>59%</td>
</tr>
<tr>
<td>Wait to make same purchase later</td>
<td>27%</td>
<td>26%</td>
</tr>
<tr>
<td>Not replaced existing equipment</td>
<td>20%</td>
<td>12%</td>
</tr>
<tr>
<td>Purchased less expensive equipment</td>
<td>18%</td>
<td>21%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Attitudes of CSRP participants**

*Most CSRP participants feel that conserving energy is important, and the proportion willing to spend extra money for energy efficient products has increased since 2009.*

CSRP participants were asked two questions to help understand their attitudes and behaviours towards energy conservation. When asked how important energy conservation has been to them over the past five years, close to eight in ten say it is extremely (35%) or very (43%) important, while another two in ten (19%) say it is somewhat important. Only three percent say it is not important to them. These results are similar to the attitudes towards energy conservation expressed in 2009. (Q.41)
Importance of energy conservation over past five years

Next, participants were asked how often in the past five years, when making purchases that affect their energy use, they have spent more money on an energy efficient product. One quarter (27%) of participants say that they spend more on energy efficient options all of the time, while more than half (54%) say they do so most of the time. Only 16 percent say they spend more for energy efficiency about half the time or less. Since 2009, the proportion who spend more on energy efficient options most of the time has increased, while the proportion who do so infrequently (i.e., half the time or less) has grown smaller. (Q.42)

Frequency of spending more for energy efficient option over past five years

CAC Temperature Settings

The majority of new CAC system owners who had their equipment installed last summer changed the temperature setting, most commonly increasing the thermostat by around two degrees Celsius.

The CSRP survey asked participants receiving a rebate for a CAC about temperature settings on their new system. Of those who had installed a new CAC, seven in ten (69%) had their system installed early enough for use in the summer of 2010; just over half (55%) of that group report having set the temperature differently with their new air conditioner. (Q.11, 12)

Among those using a different temperature setting, eight in ten (81%) say the thermostat is set warmer with an average change in temperature of roughly 2 degrees Celsius. (Q.13, 14)
Furnace Temperature Settings

The majority of participants use the "auto" setting on the furnace in the winter, and reported use of this setting has increased since they installed their new furnace. The "auto" setting is also the most commonly used in the summer, with most participants indicating that they use the furnace fan setting their contractor recommended.

Participants receiving a rebate for a new furnace were asked about their settings on their new system in the winter and summer.

Winter. Since installing their new furnace, the proportion who have use the "auto" setting (i.e., fan runs intermittently) in the winter has increased from two-thirds (68%) to three-quarters (76%), while the proportion who use the "on" setting (i.e., fan blows at all times) has declined (from 32% to 26%). (Q.26, 27)

<table>
<thead>
<tr>
<th>Winter furnace settings used on previous and new furnace</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Furnace</td>
</tr>
<tr>
<td>76%</td>
</tr>
<tr>
<td>26%</td>
</tr>
<tr>
<td>Previous Furnace</td>
</tr>
<tr>
<td>68%</td>
</tr>
<tr>
<td>32%</td>
</tr>
</tbody>
</table>

Summer. In the summer, just over half (56%) say the fan on their new furnace is set to "auto", three in ten (28%) set it to "on" and the remaining 16 percent turn their furnace fan off altogether. Changing the setting from their previous furnace is most common among those who now keep their furnace fan on (55%), and is less common among those who set their new furnace fan to "auto" (31% have switched to this setting) or "off" (10% have switched to this setting). (Q.28, 29)

When asked what furnace fan setting their contractor recommended, just over half (54%) say they were told to use "auto", while one-third (33%) were told to use "on" (13% say they did not use a contractor for the job). Participants generally appear to be using the summer furnace fan setting recommended by their contractor. That is, among participants who set their new furnace to "on" in the summer, almost nine in ten (87%) say that is what their contractor recommended. Almost eight in ten (78%) of participants who are using the "auto" setting say it was recommended by their contractor. (Q.30)

Thermostat Settings

Most participants who received a rebate for a programmable thermostat plan to use them to lower the temperature during certain periods of the day during the winter. Close to half say they are using it this summer to set a higher temperature during the day.

Almost all (87%) participants who received a rebate for a programmable thermostat say they plan to regularly lower the
temperature in their home when at work, or sleeping. The average amount by which they plan to lower temperatures is approximately 3 degrees Celsius. (Q.37, 38)

This summer, nearly half (47%) of participants say they are setting the temperature higher in their home during the day, while the remainder are setting the temperature lower (19%) or the same as other times (26%) (7% say they do not have air conditioning). The average temperature increase is roughly 2 degrees Celsius. (Q.39, 40)

Participant Spillover

*CSRP participants report additional efforts to learn about and to improve the energy efficiency of their home since participating in the CSRP, with one in four who credit the program directly for this.*

CSRP participants were asked about the impact of taking part in the CSRP on other efforts to conserve energy.

Most participants say they have made a lot (40%) or a little (38%) more effort to learn about opportunities to improve the energy efficiency of their home since participating in the CSRP. The remaining two in ten (22%) say their effort in this area has not changed. (Q.43)

CSRP participants report taking a wide range of other actions to reduce their energy consumption since participating in the CSRP. The most common is to install energy efficient lighting (66%), followed by improving insulation in the home (49%), and purchasing more efficient appliances (44%) and windows (39%). (Q.44)

**Other actions taken to reduce energy use since participating in CSRP**

<table>
<thead>
<tr>
<th>Action</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>More efficient lighting</td>
<td>66%</td>
</tr>
<tr>
<td>Insulation or air tightening</td>
<td>49%</td>
</tr>
<tr>
<td>More efficient appliances</td>
<td>44%</td>
</tr>
<tr>
<td>More efficient windows</td>
<td>39%</td>
</tr>
<tr>
<td>Improved water heating system</td>
<td>29%</td>
</tr>
<tr>
<td>Other upgrades to heating/cooling</td>
<td>20%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
</tr>
<tr>
<td>None/ no other actions</td>
<td>9%</td>
</tr>
</tbody>
</table>

Only a minority of those who have taken any of these actions to reduce energy use credit this directly to the CSRP. One in four (27%) say that the CSRP showed them they could reduce their energy use and save money, and that they looked for other opportunities to do so. One in three (32%) might have taken these actions even if they had not participated in the CSRP, while four in ten (41%) would most likely have taken these other actions even without the CSRP. (Q.45)
Contractor Survey Findings

Contractor profile

Contractors taking part in the CSRP have been in business, on average, for more than two decades. Most are not new to the program, having first participated prior to 2010, and focus their CSRP efforts on residential customers.

On average, contractors report that their companies have been installing HVAC systems for 24 years. Southwestern Ontario is the region most commonly served (34%), followed by the outer Greater Toronto Area (24%), the City of Toronto (22%), eastern Ontario (19%) and central Ontario (14%); relatively few contractors (5%) say they serve northern Ontario. (Q.2, 3)

Most contractors took part in the CSRP prior to 2010. Nearly half (44%) first participated in its initial year, 2006; in each year between 2007 and 2009, an additional 14 to 15 percent joined. One in ten (12%) contractors indicated that 2010 was the first year in which they participated. (Q.4)

The large majority (91%) of contractors aggressively promote the CSRP to residential customers rather than to commercial buyers (5%). (Nine percent say they do not aggressively promote). (Q.1)

CAC Installation Trends

Contractors report a greater number of AC units installed in 2010 than in 2009, both overall and specific to ENERGY STAR-qualified systems. Half also anticipate a further increase in 2011, but they are less optimistic about this than last year.

How do contractors characterize their AC market compared to 2009? Half (52%) say that they installed more AC units (regardless of types) in 2010 than in the previous year, which is larger than the proportion that reported an increase between 2008 and 2009 (36%). In the current study, one-third (36%) say the total number of units installed in 2010 has not changed, while only thirteen percent say their sales declined. (Q.13)

Change in AC market from previous year

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>52%</td>
<td>36%</td>
</tr>
<tr>
<td>More units installed than in previous year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About the same number of units installed as in previous year</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The majority view that CAC installations have increased is confirmed by the actual number of installations reported. The average number of AC systems (regardless of type) installed in residences per contractor has risen from 75 in 2009 to 99 in 2011. The average number of ENERGY STAR qualified systems installed in residences has also increased, from 49 to 58. (Q.6,7)

### Average number of installations reported by year

<table>
<thead>
<tr>
<th>Year</th>
<th>CAC systems installed in residences</th>
<th>Energy Star qualified CAC systems installed in residences</th>
<th>&quot;Residential-type&quot; CAC systems installed in businesses</th>
<th>Energy Star qualified &quot;residential-type&quot; CAC systems installed in businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>65.5</td>
<td>36.4</td>
<td>22.7</td>
<td>14.2</td>
</tr>
<tr>
<td>2007</td>
<td>68.7</td>
<td>35.7</td>
<td>22.9</td>
<td>13.9</td>
</tr>
<tr>
<td>2008</td>
<td>74.4</td>
<td>44.4</td>
<td>31.3</td>
<td>14.8</td>
</tr>
<tr>
<td>2009</td>
<td>75</td>
<td>49.3</td>
<td>35.2</td>
<td>20.3</td>
</tr>
<tr>
<td>2010</td>
<td>99.4</td>
<td>58.2</td>
<td>32.3</td>
<td>21.9</td>
</tr>
</tbody>
</table>

When asked about the proportion of ENERGY STAR-qualified AC systems they installed in residences, more than half (58%) of contractors say it has increased between 2009 and 2010, while four in ten (38%) say it has remained the same (only four percent say it has declined). Across the overall population of contractors, however, the reported number of ENERGY-STAR qualified CAC systems as a proportion of all residential installations is down, from 66 percent in 2009 to 59 percent in 2010. (Q.8)

By comparison to residential installations, the number of "residential-type" units installed in businesses has remained relatively unchanged. In 2010, the average number of such installations per contractor is 32, while the average number that are ENERGY STAR-qualified is 22, both fairly stable compared to 2009. (Q.9,10)

For those that install "residential type" systems in commercial properties, three in ten (28%) say that an increased proportion were ENERGY-STAR qualified in 2010. The majority (68%) say the proportion has remained the same since 2009. Across the overall population of contractors, however, the reported number of ENERGY-STAR qualified CAC systems as a proportion of all "residential type" commercial installations is up, from 58 percent in 2009 to 69 percent in 2010. (Q.11)

**Category of residential installation**. Contractors were asked what percentage of their residential installations fall into the categories of new construction, new installations in existing homes, or replacements of existing systems. Residential installations are most likely to involve the replacement of a previous system (63% of the time, on average), rather than a new installation in an existing home (24% average) or new construction (13% average). (Q.15)

**Outcome of service call**. Contractors were also asked about the outcome of service calls for AC systems over ten years old. The outcome typically either involves repairs to the system (48% of the time, on average) or replacing the system (46% average); only a small percentage of the time does the customer leave the system non-functioning (6%). This is generally consistent with the outcomes reported in 2008 and 2009. (Q.16)
Outcome of service call for AC systems over 10 years old

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repaired unit</td>
<td>48%</td>
<td>48%</td>
<td>52%</td>
</tr>
<tr>
<td>Customer left system non-functioning</td>
<td>6%</td>
<td>5%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Anticipated demand for 2011. Contractors are less optimistic than in 2009 about changes in demand for replacement AC installations in the coming year. Half (50%) of contractors expect at least a small increase in 2011, down from six in ten (63%) who anticipated an increase in 2010. Looking ahead to 2011, two in ten (22%) anticipate there will no change in demand, while almost three in ten (28%) believe demand will actually decrease. (Q.14)

Anticipated demand for replacement AC installations in 2011

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Increase</td>
<td>2%</td>
<td>48%</td>
<td>22%</td>
</tr>
<tr>
<td>Small to Moderate Increase</td>
<td>48%</td>
<td>56%</td>
<td>24%</td>
</tr>
<tr>
<td>No Change</td>
<td>22%</td>
<td>12%</td>
<td>12%</td>
</tr>
</tbody>
</table>
Furnace Installation Trends

Contractors report growth in the number of furnace units installed between 2009 and 2010, but the average number of ENERGY STAR-qualified systems remains unchanged. Six in ten anticipate a further increase in demand in 2011, but they are slightly less optimistic about this than last year.

How do contractors characterize their furnace market compared to 2009? More than half (56%) say that they installed more furnace units (regardless of type) in 2010 than in the previous year, which is considerably smaller than the proportion that reported an increase between 2008 and 2009 (84%). In the current study, one-third (35%) say the total number of units installed in 2010 has not changed, while only nine percent say their sales declined. (Q.33)

Change in furnace market from previous year

The majority view that furnace installations have increased is confirmed by the actual number of installations reported. The average number of furnaces (regardless of type) installed in residences per contractor has risen from 113 in 2009 to 142 in 2011. However, the average number of ENERGY STAR-qualified systems installed in residences has remained stable at 79. (Q.23,24)

Average number of furnace installations reported by year

<table>
<thead>
<tr>
<th>Year</th>
<th>Furnace units installed in residences</th>
<th>Furnace units with ECMs installed in residences</th>
<th>&quot;Residential-type&quot; Furnace units installed in businesses</th>
<th>&quot;Residential-type&quot; Furnace units with ECMs installed in businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>74.4</td>
<td>38.5</td>
<td>17</td>
<td>15.3</td>
</tr>
<tr>
<td>2007</td>
<td>92.9</td>
<td>42.3</td>
<td>18.5</td>
<td>15.9</td>
</tr>
<tr>
<td>2008</td>
<td>105.1</td>
<td>64.1</td>
<td>18.2</td>
<td>17.3</td>
</tr>
<tr>
<td>2009</td>
<td>113.1</td>
<td>78.8</td>
<td>28.6</td>
<td>18.1</td>
</tr>
<tr>
<td>2010</td>
<td>141.6</td>
<td>78.6</td>
<td>39.5</td>
<td>24.6</td>
</tr>
</tbody>
</table>

When asked about the proportion of ENERGY STAR-qualified furnace systems they installed in residences, seven in ten (70%) of contractors say it has increased between 2009 and 2010, while one in four (26%) say it has remained the same.
(only four percent say it has declined). This is not borne out in the findings however: across the overall population of contractors, however, the reported number of ENERGY-STAR qualified furnaces as a proportion of all residential installations is down, from 70 percent in 2009 to 56 percent in 2010. (Q.25)

By comparison to residential installations, the number of "residential-type" units installed in businesses has also increased, but not as dramatically. In 2010, the average number of such installations per contractor is 40, while the average number that are ENERGY STAR-qualified is 25, both up from 2009. (Q.26,27)

For those that install "residential type" systems in commercial properties, one in three (33%) say that an increased proportion of furnaces were ENERGY-STAR qualified in 2010. The majority (59%) say the proportion has remained the same since 2009. Across the overall population of contractors, the reported number of ENERGY-STAR qualified furnaces as a proportion of all "residential type" commercial installations is stable at 62 percent in 2010. (Q.28)

**Category of residential installation.** Contractors were asked what percentage of their residential furnace installations fall into the categories of new construction, new installations in existing homes, or replacements of existing systems. Residential furnace installations are most likely to involve the replacement of a previous system (75% of the time, on average), rather than a new installation in an existing home (13% average) or new construction (12% average). (Q.35)

**Outcome of service call.** Contractors were also asked about the outcome of service calls for furnaces over ten years old. The outcome is more likely to involve repairs to the system (58% of the time, on average) rather than replacing the system (40% average); only a small percentage of the time does the customer leave the system non-functioning (2%). This is generally consistent with the outcomes reported in 2009, although it is up from the proportion of customers replacing old systems in 2008. (Q.36)

### Outcome of service call for furnaces over 10 years old

<table>
<thead>
<tr>
<th>Year</th>
<th>Repaired unit</th>
<th>System non-functioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>2009</td>
<td>62%</td>
<td>38%</td>
</tr>
<tr>
<td>2010</td>
<td>58%</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Anticipated demand for 2011.** Contractors are slightly less optimistic than in 2009 about changes in demand for replacement furnace installations in the coming year. Six in ten (60%) of contractors expect at least a small increase in 2011, down from seven in ten (71%) who anticipated an increase in 2010. Looking ahead to 2011, two in ten (20%) anticipate there will no change in demand, while an almost equal proportion (21%) believe demand will actually decrease. (Q.34)
Anticipated demand for replacement furnace installations in 2011

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>8%</td>
<td>51%</td>
<td>20%</td>
</tr>
</tbody>
</table>

- Large Increase
- Small to Moderate Increase
- No Change

Customer Familiarity with Incentives

Contractors believe furnace customers are more familiar with the CSRP than are AC customers. They also believe both groups are equally familiar with non-CSRP incentives.

Contractors were asked how familiar they believe their customers are with the CSRP and other incentives for purchasing energy efficient systems.

AC customers. Contractors believe their AC customers are equally familiar with the CSRP and non-CSRP rebates. Six in ten (63%) say their AC customers are at least somewhat familiar with the CSRP, and an equal proportion (63%) say the same about other incentives. (Q.19,20)

Familiarity of AC customers with CSRP and non-CSRP incentives

- **CSRP Incentive**
  - Very Familiar
  - Somewhat Familiar
  - Not Very Familiar
  - Not at all Familiar

- **Non-CSRP Incentives**
  - 5% Very Familiar
  - 58% Somewhat Familiar
  - 33% Not Very Familiar
  - 3% Not at all Familiar

Furnace customers. Contractors believe furnace customers are more familiar with the CSRP than are AC buyers; but once again, they consider them almost equally familiar with non-CSRP incentives. Seven in ten (72%) contractors say their furnace customers are at least somewhat familiar with the CSRP, comparable to the proportion (67%) who say the same of other incentives. (Q.30,31)
Familiarity of furnace customers with CSRP and non-CSRP incentives

<table>
<thead>
<tr>
<th></th>
<th>CSRP Incentive</th>
<th>Non-CSRP Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Familiar</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Somewhat Familiar</td>
<td>62%</td>
<td>54%</td>
</tr>
<tr>
<td>Not Very Familiar</td>
<td>24%</td>
<td>29%</td>
</tr>
<tr>
<td>Not at all Familiar</td>
<td>3%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Participation in Incentive Programs

Contractors believe that close to half of their AC and furnace customers receive an ecoEnergy rebate in addition to the CSRP, while other non-CSRP incentives are less common.

Contractors were asked how often their customers take part in other incentive programs beyond the CSRP.

AC customers. Aside from the CSRP, contractors believe the ecoEnergy rebate is the most commonly received incentive, with half of contractors (49%) saying their customers usually take part. Three in ten each say the same about the Ontario Home Energy Savings Program (30%) and a manufacturer’s incentive (29%). Fifteen percent say their customers usually receive a discount from the contractor themselves. (Q.21)

Frequency with which AC customers receive non-CSRP incentives

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Usually</th>
<th>Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecoEnergy</td>
<td>49%</td>
<td>24%</td>
</tr>
<tr>
<td>Ontario Home Energy Savings Program</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>Manufacturer’s Incentive</td>
<td>29%</td>
<td>16%</td>
</tr>
<tr>
<td>Contractor’s Discount</td>
<td>15%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Furnace customers. Contractors report similar levels of participation in other incentive programs among their furnace customers. Just over half (53%) usually receive the ecoEnergy incentive, according to contractors, while three in ten each get the Ontario Home Energy Savings Program rebate (32%) and/or a manufacturer’s rebate (28%). Close to two in ten (17%) say their furnace customers usually receive a rebate from local gas utilities, while twelve percent usually receive a discount from the contractor themselves. (Q.32)
**Frequency with which furnace customers receive non-CSRP incentives**

<table>
<thead>
<tr>
<th>Source of Incentive</th>
<th>Usually (%)</th>
<th>Sometimes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecoEnergy</td>
<td>53%</td>
<td>25%</td>
</tr>
<tr>
<td>Ontario Home Energy Savings Program</td>
<td>32%</td>
<td>28%</td>
</tr>
<tr>
<td>Manufacturer’s Incentive</td>
<td>28%</td>
<td>17%</td>
</tr>
<tr>
<td>Incentive from Local Gas Utility</td>
<td>17%</td>
<td>16%</td>
</tr>
<tr>
<td>Contractor’s Discount</td>
<td>12%</td>
<td>12%</td>
</tr>
</tbody>
</table>

**Importance of Incentives**

*Contractors say it is most common for AC and furnace customers to choose energy efficient options because of the CSRP. The value of the rebate, reduced energy bills and energy efficient equipment are all considered motivating factors for consumers.*

To better understand the importance of incentives, contractors were given a series of five scenarios and asked to rank each from most to least common among their customers.

**AC customers.** According to contractors, choosing a system because of the CSRP is the most common scenario (61% overall), including when customers came to them to already intending to purchase an energy efficient system (38%) or when they were convinced to buy one (23%). Only one-quarter (25%) of the time are customers most likely to purchase an ENERGY STAR system regardless of rebate. The least common scenarios are those involving the decision to purchase an ENERGY STAR system because of a non-CSRP rebate. (Q.22)

**Most common scenarios in customer decision to purchase ENERGY STAR air conditioner**

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>5 Most Common</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1 Least Common</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase an ENERGY STAR system because of CSRP rebate</td>
<td>38%</td>
<td>22%</td>
<td>21%</td>
<td>10%</td>
<td>9%</td>
<td>3.7</td>
</tr>
<tr>
<td>Purchase an ENERGY STAR system regardless of rebate</td>
<td>25%</td>
<td>18%</td>
<td>19%</td>
<td>12%</td>
<td>26%</td>
<td>3.0</td>
</tr>
<tr>
<td>Purchase a non-ENERGY STAR system, but was convinced otherwise by CSRP rebate</td>
<td>23%</td>
<td>21%</td>
<td>15%</td>
<td>22%</td>
<td>19%</td>
<td>3.1</td>
</tr>
<tr>
<td>Purchase an ENERGY STAR system because of a non-CSRP rebate</td>
<td>9%</td>
<td>22%</td>
<td>26%</td>
<td>27%</td>
<td>17%</td>
<td>2.8</td>
</tr>
<tr>
<td>Purchase a non-ENERGY STAR system, but was convinced otherwise by a non-CSRP rebate</td>
<td>5%</td>
<td>17%</td>
<td>20%</td>
<td>29%</td>
<td>29%</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Furnace customers. The order of frequency of these scenarios is identical for furnaces as for AC systems. Choosing an ECM furnace because of the CSRP is the most common scenario (51% overall), including when customers came to them already intending to purchase an energy efficient system (35%) or when they were convinced to buy one (16%). Only one-quarter (28%) of the time are customers most likely to purchase an ECM furnace regardless of rebate. The least common scenarios are those involving the decision to purchase an ECM furnace system because of a non-CSRP rebate (21% combined). (Q.41)

Most common scenarios in customer decision to purchase furnace with ECM

<table>
<thead>
<tr>
<th>The customer's intentions were most likely to…</th>
<th>5 Most Common</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1 Least Common</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase an ECM furnace because of CSRP rebate</td>
<td>35%</td>
<td>18%</td>
<td>29%</td>
<td>10%</td>
<td>8%</td>
<td>3.6</td>
</tr>
<tr>
<td>Purchase an ECM furnace regardless of rebate</td>
<td>28%</td>
<td>19%</td>
<td>14%</td>
<td>11%</td>
<td>29%</td>
<td>3.1</td>
</tr>
<tr>
<td>Purchase a non-ECM furnace, but was convinced otherwise by CSRP rebate</td>
<td>16%</td>
<td>23%</td>
<td>17%</td>
<td>20%</td>
<td>24%</td>
<td>2.9</td>
</tr>
<tr>
<td>Purchase an ECM furnace because of a non-CSRP rebate</td>
<td>13%</td>
<td>22%</td>
<td>23%</td>
<td>28%</td>
<td>14%</td>
<td>2.9</td>
</tr>
<tr>
<td>Purchase a non-ECM furnace, but was convinced otherwise by a non-CSRP rebate</td>
<td>8%</td>
<td>18%</td>
<td>17%</td>
<td>32%</td>
<td>25%</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Motivation for participating in CSRP. Contractors believe there are several motivators behind a customer’s decision to participate in the CSRP. These include a reduction in energy bills (75%), the value of the rebate (72%), and having energy efficient equipment (68%). Fewer think their customers are motivated primarily by getting the best deal (43%) or the desire to be environmentally responsible (25%). (Q.42)
Contractors were also asked to select what they feel is the most important factor behind their customer’s decision to participate in the CSRP. The value of the rebate is considered the single most important by one in four (27%), followed by the reduction in energy bills (15%), getting the best deal (10%), and having energy efficient equipment (9%). Nearly four in ten (37%) could not choose a single factor, indicating that more than one is equally important to customers. (Q.42b)

**Impact on Contractor Practices**

*The CSRP has affected the furnace sizing methods of a minority of contractors. Encountering incorrectly sized systems is more common for furnaces than AC units. Heat loss modeling is the most widely used technique to determine the appropriate size of the replacement.*

Along with understanding the impact on customer behavior, a goal of this survey is to help understand what impact the CSRP has on contractor practices. One in three (33%) contractors say they have changed their furnace sizing methods in order to participate in the CSRP; this is consistent with the proportion in 2009 (31%). The remaining two-thirds (67%) report no change to their sizing methods. (Q.37)

In replacement AC system installations, contractors say they install a system with a lower capacity than the one being replaced 15 percent of the time, on average. In 2009, this occurred on average 23 percent of the time, suggesting that installations to replace incorrectly-sized systems are declining. (Q.18)

For replacement furnace installations, the percentage of time a lower capacity system is installed is much higher. Contractors report installing a furnace system with a lower capacity 45 percent of the time, on average. This figure is also down from 2009, when this occurred 61 percent of the time. (Q.38)

How do contractors determine the appropriate size for the replacement system? For AC replacements, the most common technique, used by three in four (74%) contractors, is heat loss modeling. Half (47%) rely on their professional judgment, while three in ten (28%) match the existing unit size. (Q.36a)

For furnace replacements contractors follow similar techniques. Three in four (77%) use heat loss modeling, while half (47%) use professional judgment and two in ten (22%) match the existing unit size. The option of using a rule of thumb or looking up a table based on the floor area was also offered for this question, and 17 percent of contractors say they use this method. (Q.36a)

**Satisfaction with CSRP**

*Nearly all contractors are generally, if not fully, satisfied with the CSRP. The majority have seen an increase in sales as a direct result of participation.*

To what extent are contractors satisfied with the CSRP and the impact it has had on their business? Contractors are largely positive about the program. Six in ten (61%) say they are very satisfied with it, while another third (34%) are somewhat satisfied; only four percent say they are dissatisfied. (Q.43)

Contractors who are not fully satisfied with the CSRP cite a combination of process issues and concerns about the program itself. In terms of process, some cite concerns about the amount of paperwork (26%) and the fact that the rebate was delayed (16%). Program-related concerns include that the incentive is not big enough (20%) or that the program is too complicated (18%). Other causes of dissatisfaction include difficulty in locating AHRI numbers (9%), that geothermal heating is not covered (4%), and an inefficient website (3%). (Q.44)
Contractors were also asked if they have seen an increase in sales as a direct result of participation in the CSRP; a strong majority (77%) say they have. (Q.5)
Appendix B. Participant and contractor surveys
E-MAIL INVITATION

Dear [Participant Name],

We would like to invite you to participate in an online survey about the COOL SAVINGS REBATE Program, on behalf of the Ontario Power Authority (OPA). Our records indicate that you recently participated in the program, which offers rebates for the purchase and installation of ENERGY STAR air conditioners, furnaces containing ECM fans, and programmable thermostats.

Your feedback is critical to ensuring the COOL SAVINGS REBATE Program is effective and relevant for Ontarians. The OPA has retained Environics Research Group, an independent research firm, to conduct the survey, and we hope that you will find it interesting and fun to complete.

The survey is for individuals who live in the house where the rebated equipment was installed. All survey participants qualify for a draw to win one of five available cash prizes of $100 each.

The survey is short and should take you about 10 minutes to complete, depending on the rebate(s) you received. Please be assured that all answers you share with us will remain strictly confidential and none of your responses will be associated with you personally. You will not receive any solicitations based on information you share in this survey.

To participate in this survey please click the following link:

BEGIN SURVEY

If you don’t have time to complete the survey in one sitting, you can return to it by clicking on the link above again.

If you have any questions or concerns, or if you encounter technical difficulties while filling out this survey, please email onlineresearch@environics.ca.

We appreciate your support and thank you for your valuable opinions.

I do not want to participate in this study.

SURVEY INTRODUCTION

Welcome to the COOL SAVINGS REBATE Program Survey. This survey is designed to give us a better understanding of how Ontarians are using the program and how it can be improved. Your responses will be kept absolutely confidential. We very much appreciate your help.
1. For what type of equipment did you request a rebate as part of the COOL SAVINGS REBATE Program? Select all that apply.

01 – ENERGY STAR air conditioner
02 – Furnace with an ECM fan (ECMs, or electronically commutated motors, power the fan used to circulate warm air in a home and consume less energy than standard fan motors)
03 – Programmable thermostat
04 – None of the above

1a. Do you currently live in the house where the rebated equipment is installed?

01 – Yes CONTINUE
02 – No THANK AND END SURVEY “Thank you very much, but this survey is for individuals who currently live in the house where the rebated equipment is installed”.

Air Conditioners

2. [IF Q1.1 not selected] Although you did not receive a rebate for a new central air conditioner, we would like to know what type of cooling system you have in your home. Select all that apply.

01 – Central air conditioning
02 – Window unit air conditioner
03 – Room air conditioner
04 – No air conditioner

NOW SKIP TO Q.17 (Furnace section)

3. Where did you hear that you could get a COOL SAVINGS REBATE for purchasing an energy-efficient air conditioning system? Select all that apply.

01 – Newspaper ad
02 – Radio ad
03 – From my local electric utility
04 – From my contractor
05 – On the Internet
06 – From family/friends
07 – Other (PLEASE SPECIFY)
99 – Don’t recall

4. What is the size of your new air conditioner in BTUs?

____ ____ ___, 000 BTUs [range 1,000-999,000]

99 – Don’t know

5. DELETED

6. Did the air conditioner you installed replace an existing air conditioner?

01 – Yes SKIP TO Q.8
02 – No

7. What type of air conditioner did it replace?
Select all that apply.

01 – A central air conditioner
02 – A window air conditioner
03 – A room air conditioner

8. If the COOL SAVINGS REBATE had not been available, would you have…?
Select one only.

01 – Made the same purchase
02 – Waited to make the same purchase at a later date
03 – Purchased a less expensive air conditioner
04 – Not replaced the existing equipment
98 – Other (PLEASE SPECIFY)

9. What other rebates or tax credits, if any, did you receive for purchasing and installing your air conditioner?
Select all that apply.

01 – The federal ecoEnergy rebate
02 – The Ontario Home Energy Savings Program rebate
03 – A rebate from the equipment manufacturer
04 – A discount from your contractor
98 – Other (PLEASE SPECIFY)
97 – None of the above

10. How much was the rebate or discount you received from…?
Please round your answer to the nearest dollar
Show only those selected at Q9. Range 0-9,999

01 – The federal ecoEnergy Program $ ____________________
02 – The Ontario Home Energy Savings Program $ ____________________
03 – The equipment manufacturer $ ____________________
04 – Your contractor $ ____________________
98 – Other (PLEASE SPECIFY) $ ____________________

11. Did you have your new air conditioner installed early enough to use it last summer (2010)?

01 – Yes
02 – No

12. Did you find that your preferred thermostat temperature settings were different with the new air conditioner as opposed to your previous air conditioner?

01 – Yes
02 – No
03 – Could not set an exact temperature on previous air conditioner

13. Did you set your thermostat cooler or warmer with the new air conditioner?

01 – Cooler
02 – Warmer

14. How many degrees [if Q13.1 insert “cooler”] [if 13.2 insert “warmer”] did you set your thermostat with the new air conditioner?
Please show your answer in °F or in °C.

___ °F
OR
15. We would like to understand the factors that might have influenced your purchasing decisions. Please indicate the extent to which each of the following factors affected your decision to purchase an ENERGY STAR air conditioner.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Strongly Influenced</th>
<th>Somewhat Influenced</th>
<th>Weakly Influenced</th>
<th>Not Influenced at All</th>
<th>Cannot Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The initial purchase price</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>b. The impacts on your monthly energy costs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>c. The COOL SAVINGS REBATE offer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>d. [Show only IF Q.9 =1] The ecoEnergy rebate offer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>e. [Show only IF Q.9 =3] A rebate offer from the manufacturer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>f. [Show only IF Q.9 =4] A discount offer from your contractor</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>g. The impact on the environment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>h. The recommendation of a friend or family member</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>i. The recommendation of your contractor</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>j. Information gathered from personal research</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>k. Being able to find a replacement unit quickly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
</tbody>
</table>

16. [IF MORE THAN ONE OPTION WITH CODE 1 IN Q.15] Of the factors that strongly influenced you, which one influenced your decision the most? Select one only.

[Show 15 a-k if =1; if only one item at Q15 =1 then autofill in Q16]

97 – Two or more factors equally influenced my decision

**Furnaces**

[IF ASKED Q.3-16, SHOW]: The next set of questions is about your heating system.

17. [IF Q1.2 not selected] Although you did not receive a rebate for a new furnace, we would like to know what type of heating you operate in your home. Select all that apply.

01 – Electric forced air
02 – Natural gas furnace
03 – Oil furnace
04 – Electric heat pump
05 – Propane furnace
06 – Electric baseboard
98 – Other
99 – Don’t know

NOW SKIP TO Q.33 (Programmable thermostats)

18. Where did you hear that you could get a COOL SAVINGS REBATE for purchasing a furnace with an ECM fan? (ECMs, or electrically commutated motors, power the fan used to circulate warm air in a home. They consume less energy than standard fan motors.)

Select all that apply.

01 – Newspaper ad
02 – Radio ad
03 – From my local electric utility
04 – From my contractor
05 – On the Internet
06 – From family/friends
98 – Other (PLEASE SPECIFY)
99 – Don’t recall

19. What is the size of your new furnace in BTUs?

___ ___ ___, 000 BTUs [range 1,000-999,000]

99 – Don’t know

20. DELETED

21. What type of heating system did you replace?
Select all that apply.

CODING INSTRUCTIONS: CAPTURE “OTHER” MENTIONS BUT DO NOT CODE

01 – Electric forced air furnace
02 – Natural gas furnace
03 – Oil furnace
04 – Electric heat pump
05 – Propane furnace
06 – Electric baseboard
98 – Other (PLEASE SPECIFY)
99 – Don’t know

22. Was your previous furnace equipped with an ECM? ECMS, or electrically commutated motors, are used in some furnaces to power the fan used to circulate warm air in a home. They consume less energy than standard fan motors.

01 – Yes
02 – No
99 – Don’t know

23. If the COOL SAVINGS REBATE had not been available, would you have…?
Select one only.

01 – Made the same purchase
02 – Waited to make the same purchase at a later date
03 – Purchased a less expensive furnace
04 – Not replaced the existing equipment
98 – Other (PLEASE SPECIFY)

24. What other rebates or tax credits, if any, did you receive for purchasing and installing your furnace?
Select all that apply.
01 – The federal ecoEnergy rebate
02 – The Ontario Home Energy Savings Program rebate
03 – A rebate from your gas utility
04 – A federal tax credit
05 – A rebate from the equipment manufacturer
06 – A discount from your contractor
98 – Other (PLEASE SPECIFY)
97 – None of the above

25. How much was the rebate or discount you received from...?
Show only those options selected at Q24. Range 0-9,999

01 – The federal ecoEnergy Program $ _____
02 – The Ontario Home Energy Savings Program $ _____
03 – Your gas utility $ _____
04 – The equipment manufacturer $ _____
05 – Your contractor $ _____
98 – Other (PLEASE SPECIFY) $ _____

26. Last winter, was your new furnace set to:
Select one only.

01 – On (fan blows at all times)
02 – Auto (fan runs intermittently)

27. Did you use this same setting during the winter on your previous furnace?

01 – Yes
02 – No

28. During the summer, is the fan on your new furnace set to:
Select one only.

01 – On (fan blows at all times)
02 – Auto (fan runs intermittently)
03 – Off (fan is always off)

29. Did you use this same setting during the summer on your previous furnace?

01 – Yes
02 – No

30. What did the contractor recommend setting your furnace fan to during the summer?
Select one only.

01 – On (fan blows at all times)
02 – Auto (fan runs intermittently)
97 – Did not use contractor

31. We would like to understand the factors that might have influenced your purchasing decisions. Please indicate the extent to which each of the following factors affected your decision to purchase a furnace with an ECM fan.
(RANDOMIZE)
<table>
<thead>
<tr>
<th>Factor</th>
<th>Strongly influenced</th>
<th>Somewhat influenced</th>
<th>Weakly influenced</th>
<th>Not influenced at all</th>
<th>Cannot say</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The initial purchase price</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>b. The impacts on your monthly energy costs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>c. The COOL SAVINGS REBATE offer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>d. [Show only IF Q.24 =1] The ecoEnergy rebate offer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>e. [Show only IF Q.24 =3] A rebate offer from your gas utility</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>f. [Show only IF Q.24 = 5] A rebate offer from the manufacturer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>g. [Show only IF Q.24 = 6] A discount offer from your contractor</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>h. [IF Q.24 = 98] Another incentive or rebate [Anchor at bottom]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>i. The age of your previous equipment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>j. The impact on the environment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>k. The recommendation of a friend or family member</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>l. The recommendation of your contractor</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>m. Information gathered from personal research</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
<tr>
<td>n. Being able to find a replacement unit quickly</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>99</td>
</tr>
</tbody>
</table>

32. [IF MORE THAN ONE OPTION WITH CODE 1 IN Q.31] Of those factors that strongly influenced you, which one influenced your decision the most? Select one only.

[Show 31 a-n if =1; if only one item at Q31 =1 then autofill in Q32]

97 – Two or more factors equally influenced my decision
Programmable thermostats

[IF ASKED Q.3-16 OR Q.17-32 SHOW]: The next set of questions is about your thermostat.

33. [ASK ALL] What kind of thermostat do you now have in your home? Select one only.
   01 – Programmable thermostat that is programmed to change temperature setting according to the time of day
   02 – Programmable thermostat that is not currently programmed to change temperature setting according to the time of day
   03 – Non-programmable thermostat
   99 – Don’t know

If Q1.3 not selected, SKIP TO Q.41. OTHERWISE, CONTINUE.

34. Where did you hear that you could get a COOL SAVINGS REBATE for purchasing a programmable thermostat? Select all that apply.
   01 – Newspaper ad
   02 – Radio ad
   03 – From my local electric utility
   04 – From my contractor
   05 – On the Internet
   06 – From family/friends
   98 – Other (PLEASE SPECIFY)
   99 – Don’t recall

35. What type of thermostat did the rebated thermostat replace? Select one only.
   01 – Programmable thermostat (a thermostat than can be programmed to change temperature setting according to the day and time)
   02 – Non-programmable digital thermostat
   03 – Mercury thermostat
   04 – Analog thermostat without mercury
   98 – Other
   99 – Don’t know

36. [ONLY IF Q.35 CODE 1] Was your previous thermostat programmed to change the temperature setting according to the time of day…? Select one only.
   01 – All of the time
   02 – Sometimes
   03 – Never
37. Next winter, do you plan to regularly lower the temperature in your home during certain time periods, for instance when you are at work or when you are sleeping? Select one only.

01 – Yes
02 – No     SKIP TO Q.39
99 – Have not decided     SKIP TO Q.39

38. How many degrees lower, on average?

*Please show your answer in °F or in °C.*

___ °F
OR
___ °C

99 – Don’t know

*[only one answer required] [Range 0-9]*

39. This summer, during daytime hours, are you setting the temperature in your home …?

Select one only.

01 – Higher
02 – Lower
03 – The same as other times of day     SKIP TO Q.41
98 – Do not have air conditioning     SKIP TO Q.41

40. How many degrees [if 39=1 insert “higher” if 39=2 insert “lower”] ?

*Please show your answer in °F or in °C.*

___ °F
OR
___ °C

99 – Don’t know

*[only one answer required][Range 0-9]*

**ASK ALL**

The next few questions are more general in nature…

41. How important would you say that conserving energy has been to you over the past five years?

Select one only.

01 – Extremely important
02 – Very important
03 – Somewhat important
04 – Not very important
05 – Not at all important
42. Over the past five years, when making purchases that affect your energy use, did you decide to spend more money for an energy efficient option…? 
Select one only.

01 – All of the time  
02 – Most of the time  
03 – About half the time  
04 – Less than half the time  
05 – Never  
98 – Not applicable/did not make purchases that affect energy use in past five years

43. As a result of participating in the COOL SAVINGS REBATE Program, have you made a lot more effort, a little more effort or about the same effort as before to learn about opportunities to improve the energy efficiency of your home? 
Select one only.

01 - A lot more effort  
02 - A little more effort  
03 - About the same effort as before

44. What other actions have you taken to reduce your energy use, or to use energy more efficiently, since you participated in the COOL SAVINGS REBATE Program? 
Select all that apply.

01 - Purchased and installed more energy efficient lighting  
02 - Other upgrades to the heating and cooling system  
03 - Upgrades to wall or ceiling insulation or air tightening  
04 - Replaced appliances with more efficient models  
05 - Replaced windows with more efficient models  
06 - Improved the water heating system  
98 - Other (PLEASE SPECIFY)  
97 – None/no other actions  

45. Which of the following statements best describes how likely would you have been to take these additional actions if you had not participated in the COOL SAVINGS REBATE Program? 
Select one only.

01 - I would most likely have taken these other actions even if I had not participated in the CSRP  
02 - I might have taken these actions even if I had not participated in the CSRP  
03 - The CSRP showed me I could reduce energy use and save money, and I looked for other opportunities to do so

46. We are nearing the end of the survey. Do you have any final comments about the COOL SAVINGS REBATE program, or any suggestions about how it can be improved?

97 – None/no comments

The last few questions are for statistical purposes only.

46a. Which of the following best describes your home? 
Select one only.
01 – Single detached house
02 – Semi-detached house
03 – Row house or townhouse
04 – Duplex or multiplex
05 – Other (PLEASE SPECIFY)

46b. What is the floor area of your home (not including the basement)?
Select one only.

01 – 600 square feet or less
02 – 601 to 1000 square feet
03 – 1001 to 1500 square feet
04 – 1501 to 2000 square feet
05 – 2001 to 2500 square feet
06 – 2501 to 3000 square feet
07 – More than 3000 square feet

47. Into which of the following age ranges do you fall?
Select one only.

01 – Under 30 years
02 – 30 – 44 years
03 – 45 – 64 years
04 – 65 years and above

48. What is the highest level of education you have completed?
Select one only.

01 - Some elementary (Grades 1-6)
02 - Completed elementary (Grade 7 or 8)
03 - Some high school (Grades 9-11)
04 - Completed high school (Grades 12 or 13 or OAC)
05 - Some community college, vocational, trade school (or some CEGEP)
06 - Completed community college, vocational, trade school (or completed CEGEP)
07 - Some university (no degree)
08 - Completed university (Bachelor’s Degree)
09 - Post graduate/professional school (Master’s Degree, Ph.D., etc.)
10 - No schooling

49. Including you, how many people live in your household?
Select one only.

01 – One or two
02 – Three or four
03 – Five or more

50. What is your total annual household income before taxes?
Select one only.

01 – Less than $20,000
02 – $20,000 to less than $40,000
03 – $40,000 to less than $60,000
04 – $60,000 to less than $80,000
05 – $80,000 to less than $100,000
06 – $100,000 to less than $120,000
07 – $120,000 or more

This completes the survey. On behalf of the Ontario Power Authority, thank you for your valuable input.
In order to enter you in the draw for one of five available cash prizes of $100, please provide your first and last name and telephone number. Please be assured that this information will only be used for the purpose of the draw, and will not be linked to your survey responses in any way.

FIRST NAME:

LAST NAME:

AREA CODE AND PHONE NUMBER:

Or click here to end the survey.

RECORD FROM SAMPLE FILE:

B. CITY

C. POSTAL CODE
E-MAIL INVITATION

Dear [Contractor Name],

We would like to invite you to participate in an online survey about the 2010 COOL SAVINGS REBATE Program (CSRP), on behalf of the Ontario Power Authority (OPA) and the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI). The purpose of the survey is to learn more about the heating and air conditioning equipment being installed in your community and of your experiences with the CSRP. Your feedback is critical, allowing us to improve the value of the CSRP to both you and your customers.

The OPA has retained Environics Research Group, an independent research firm, to conduct the survey. The survey is short and should take you about 10 minutes to complete.

In appreciation of their time, the first 200 people to complete the survey will receive a $20 gift card for the Home Depot.

Please be assured that all answers you share with us will remain strictly confidential and none of your responses will be associated with you personally or your company. You will not receive any solicitations based on information you share in this survey.

To participate in this survey please click the following link: BEGIN SURVEY

If you don’t have time to complete the survey in one sitting, you can return to it by clicking on the link above again.

If you have any questions or concerns, or if you encounter technical difficulties while filling out this survey, please email onlineresearch@environics.ca.

We appreciate your support and thank you for your valuable opinions.

I do not want to participate in this study.
SURVEY INTRODUCTION

Welcome to the COOL SAVINGS REBATE Program Survey. This survey is designed to give us a better understanding of the heating and air conditioning equipment being installed in your community and of your experiences with the CSRP. Your responses will be kept absolutely confidential. We very much appreciate your help.

In 2010, the CSRP offered the following rebates:

- $250 rebate for ENERGY STAR (14.5+ SEER) air conditioning systems
- $400 rebate for ENERGY STAR (15+ SEER) air conditioning systems
- $125 rebate for replacement furnaces that include ECMs

2009-Q1
1. To whom is your company aggressively promoting the COOL SAVINGS REBATE Program (CSRP)?
   Select all that apply.
   
   01 - Residential
   02 - Commercial
   03 - We do not aggressively promote

2009-Q2
2. What major region(s) do you serve?
   Select all that apply.
   
   01 - Eastern Ontario
   02 - Central Ontario
   03 - City of Toronto
   04 - Outer GTA
   05 - Southwestern Ontario
   06 - Northern Ontario

2009-Q3
3. For how many years has your company been installing HVAC systems?
   
   ________________ years [range 1-99]

2009-Q4
4. In what year did you first participate in the CSRP?
   Select one only.
   
   01 - 2006
   02 - 2007
   03 - 2008
   04 - 2009
   05 - 2010
2009-Q5
5. Have you seen an increase in your sales as a direct result of your participation in the CSRP?

01 - Yes
02 - No

The following questions are about the air conditioning systems installed by your company

2009-Q6
6. Approximately how many air conditioning systems (regardless of type) did your company install in residences in 2010?

__________ Number of Units [range 0-9999]

2009-Q7
7. Approximately how many ENERGY STAR qualified (min 14.5 SEER) AC systems did your company install in residences in 2010?

__________ Number of Units [range 0-9999]

NEW
8. Between 2009 and 2010, would you say the proportion of AC systems you installed in residences that are ENERGY STAR-qualified…?
Select one only.

01 - Increased
02 - Remained about the same
03 - Decreased

2009-Q8
9. Approximately how many “residential type” (e.g. split system 5 tonnes or under) AC systems did your company install in businesses in 2010?

__________ Number of Units [range 0-9999] IF ‘0’, SKIP TO Q.12

2009-Q9
10. Approximately how many “residential type” (e.g. split system 5 tonnes or under) ENERGY STAR-qualified AC systems did your company install in businesses in 2010?

__________ Number of Units [range 0-9999]

NEW
11. Between 2009 and 2010, would you say the proportion of “residential type” (e.g. split system 5 tonnes or under) AC systems you installed in businesses that are ENERGY STAR-qualified…?
Select one only.

01 - Increased
02 - Remained about the same
03 - Decreased
2009-Q10
12. For all CSRP eligible AC systems installed in 2010, whether in residences or businesses, what percentage would you say applied for the CSRP rebate?

__________% applied [range 0-100]

2009-Q11 modified wording
13. Which of the following statements best describes the total number of AC units (regardless of type) that your company installed in 2010?
Select one only.

01 - More units installed than in 2009
02 - About the same number of units installed as in 2009
03 - Fewer units installed than in 2009

2009-Q12
14. Do you anticipate any further changes in the demand for replacement AC installations in 2011?
Select one only.

01 - Large increase
02 - Small to moderate increase
03 - No change
04 - Small to moderate decrease
05 - Large decrease

2009-Q14
15. In 2010, what percentage of your residential installations (including non-eligible CSRP units) was in each of the following categories?
(Answers should add up to 100%)

__________% New construction
__________% New installation in existing home
__________% Replacement of existing system

2009-Q16
16. Since January 2010, when your company was called to service an AC system that was over ten years old, what usually happened?
(Answers should add up to 100%)

__________% of time customer chose to leave system non-functioning
__________% of time we repaired the system
__________% of the time we replaced the system rather than repair it

2009-Q21
17. Thinking only of installations of systems that do not qualify for the CSRP, what percentage of your replacement AC installations are . . .
(Answers should add up to 100%)

__________% Condenser-only change outs (using existing indoor coil)
__________% Condensing unit with third-party non-ARI-matched coil
__________% Condensing unit with third-party ARI-matched coil
__________% Condensing unit with coil from the same manufacturer
NEW

17a. How do you determine the appropriate size for the replacement unit?
   Select all that apply.

01 – Match existing unit size
02 – Professional judgment
03 – Heat loss modeling
04 – Other (PLEASE SPECIFY)

2009-Q24

18. In replacement installations (including both those that qualify and those that do not qualify for the CSRP), what percentage of time do you install an AC system with a lower capacity than the existing system?

___________% of time [range 0-100%]

NEW

19. Overall, how familiar would you say your AC customers are with the CSRP?
   Select one only.

01 – Very familiar
02 – Somewhat familiar
03 – Not very familiar
04 – Not at all familiar

NEW

20. How familiar would you say your AC customers are with other, non-CSRP incentives available to them?
   Select one only.

01 – Very familiar
02 – Somewhat familiar
03 – Not very familiar
04 – Not at all familiar

NEW

21. How often do your customers receive each of the following incentives beyond the CSRP incentive for their air conditioner?

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
<th>Cannot say</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecoEnergy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Ontario Home Energy Savings Program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Manufacturer’s incentive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Contractor’s discount</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Other (PLEASE SPECIFY)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
</tbody>
</table>
2009-Q26
22. Please order the frequency with which each of the following scenarios occurs among your customers that purchased an ENERGY STAR AC system in 2010. Please use a scale from ‘1’ to ‘5’ where ‘1’ is the least common scenario and ‘5’ is the most common scenario. Please use each number between 1 and 5 only once.

[Ranking]

The customer came to me looking to purchase . . .

_______ an ENERGY STAR system regardless of rebates
_______ an ENERGY STAR system because of a non-CSRP rebate
_______ an ENERGY STAR system because of the CSRP rebate
_______ a non-ENERGY STAR system but was convinced otherwise by a non-CSRP rebate
_______ a non-ENERGY STAR system but was convinced otherwise by the CSRP rebate

The next set of questions is about the furnace systems installed by your company.

2009-Q27
23. Approximately how many furnaces did your company install in residences in 2010?

__________ Number of Units [range 0-9999]

2009-Q28
24. Approximately how many furnaces with electronically commutated motors (ECMs) did your company install in residences in 2010?

__________ Number of Units [range 0-9999]

NEW
25. Between 2009 and 2010, would you say the proportion of furnaces you have installed in residences that have ECMs has…?
Select one only.

01 - Increased
02 - Remained about the same
03 - Decreased

2009-Q29
26. Approximately how many “residential type” furnaces did your company install in businesses in 2010?

__________ Number of Units [range 0-9999]

2009-Q30
27. Approximately how many “residential type” furnaces with ECMs did your company install in businesses in 2010?

__________ Number of Units [range 0-9999]
28. Between 2009 and 2010, would you say the proportion of “residential type” furnaces you have installed in businesses that have ECMs has…?
Select one only.

01 - Increased
02 - Remained about the same
03 - Decreased

29. For all CSRP eligible furnaces installed in 2010, whether in residences or businesses, what percentage would you say applied for the CSRP rebate?

_________% applied [range 0-100]

30. Overall, how familiar would you say your furnace customers are with the CSRP?
Select one only.

01 – Very familiar
02 – Somewhat familiar
03 – Not very familiar
04 – Not at all familiar

31. How familiar would you say your furnace customers are with other, non-CSRP incentives available to them?
Select one only.

01 – Very familiar
02 – Somewhat familiar
03 – Not very familiar
04 – Not at all familiar

32. How often do your customers receive each of the following incentives beyond the CSRP incentive for their furnace?

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
<th>Cannot say</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecoEnergy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario Home Energy Savings Program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Incentive from local gas utility</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Manufacturer’s incentive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Contractor’s discount</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Other (PLEASE SPECIFY)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>99</td>
</tr>
</tbody>
</table>
2009-Q32
33. Which of the following statements best describes the total number of ECM furnaces (regardless of type) that your company installed in 2010? Select one only.
   01 - More units installed than in 2009
   02 - About the same number of units installed as in 2009
   03 - Fewer units installed than in 2009

2009-Q33
34. Do you anticipate any further changes in the demand for replacement furnace installations in 2011? Select one only.
   01 - Large increase
   02 - Small to moderate increase
   03 - No change
   04 - Small to moderate decrease
   05 - Large decrease

2009-Q35
35. In 2010, what percentage of your residential furnace installations (including non-eligible CSRP units) was in each of the following categories? (Answers should sum up to 100%)

   % New construction
   % New installation in existing home
   % Replacement of existing system

2009-(missing q’n number)
36. Since January 2010, when your company was called to service a furnace that was over ten years old, what usually happened? (Answers should sum up to 100%)

   % of time customer chose to leave system non-functioning
   % of time we repaired the system
   % of the time we replaced the system rather than repair it

NEW
36a. How do you determine the appropriate size for the replacement unit? Select all that apply.
   01 – Match existing unit size
   02 – Professional judgment
   03 – Heat loss modeling
   04 – Rule of thumb/look up table based on floor area
   98 – Other (PLEASE SPECIFY)

2009-Q43
37. Did you change your furnace sizing methods to participate in the COOL SAVINGS REBATE Program?
   01 - Yes
   02 - No
2009-Q41
38. In replacement installations, what percentage of time do you install a furnace with a lower capacity than the existing system?

__________% of time [range 0-100]

2009-Q42
39. What advice do you normally give your customers who purchase furnaces with ECMs (and have central AC)?
   Check all that apply.

01 - Advise to set fan to ‘auto’ in the winter
02 - Advise to set fan to ‘on’ in the winter
03 - Advise to set fan to ‘auto’ in summer
04 - Advise to set fan to ‘on’ in summer
05 - Advise not to change fan setting
06 - No advice given on this subject

2009-Q46
41. Please order the frequency with which each of the following scenarios occurs among your customers that purchased a furnace with an ECM in 2010. Please use a scale from ‘1’ to ‘5’ where ‘1’ is the least common scenario and ‘5’ is the most common scenario. Please use each number between 1 and 5 only once.

[Ranking]

The customer came to me looking to purchase . . .

_____ a furnace with an ECM regardless of rebates
_____ a furnace with an ECM because of a non-CSRP rebate
_____ a furnace with an ECM because of the CSRP rebate
_____ a furnace without an ECM but was convinced otherwise by a non-CSRP rebate
_____ a furnace without an ECM but was convinced otherwise by the CSRP rebate

The final questions are about the CSRP as a whole.

2009-Q58
42. What do you think are the primary motivators behind your customers’ decision to participate in the rebate program in 2010?
   Check all that apply.

01 - Having energy efficient equipment
02 - Value of the rebate
03 - Being “green”
04 - Reduction in energy bills
05 - Getting the best deal
06 - Other (PLEASE SPECIFY)

2009-Q58
42b. (IF MORE THAN ONE OPTION SELECTED IN Q42) Which do you think is the single most important factor behind your customers’ decision to participate in the rebate program in 2010?

IMPORT RESPONSES FROM Q42
2009-Q59
43. How satisfied were you with the 2010 COOL SAVINGS REBATE Program?
   Select one only.

01 - Very satisfied  SKIP TO END
02 - Somewhat satisfied
03 - Somewhat dissatisfied
04 - Very dissatisfied

2009-Q60
44. (IF NOT VERY SATISFIED) What are the main reasons why you were (CODE 2: not fully satisfied / CODES 3-4: dissatisfied) with the 2010 program?

________________________________________________________________
________________________________________________________________

This completes the survey. On behalf of the Ontario Power Authority, thank you for your valuable input.

In order for us to send you a $20 gift card for the Home Depot to thank you for your time and participation, please provide your first and last name and mailing address. Please be assured that this information will only be used for the purpose of sending you the gift card, and will not be linked to your survey responses in any way.

FIRST NAME:
LAST NAME:
MAILING ADDRESS:
CITY:
PROVINCE:
POSTAL CODE:

Or click here to end the survey.

RECORD FROM SAMPLE FILE:
A. CITY
B. POSTAL CODE
providing environmental and energy consulting to private, public and non-governmental organizations

IndEco Strategic Consulting Inc
77 Mowat Avenue Suite 412 Toronto ON M6K 3E3
1 888 INDECO1 416 532 4333 info@indeco.com www.indeco.com