

**FINAL EVALUATION REPORT:
2007 SUMMER SAVINGS PROGRAM**

Presented to



Ontario Power Authority™

120 Adelaide Street West, Suite 1600
Toronto, Ontario M5H 1T1

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Navigant Consulting Inc.
1 Adelaide Street East, Suite 2601
Toronto, ON M5C 2V9
416.927.1641
www.navigantconsulting.com

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EXECUTIVE SUMMARY

The 2007 Summer Savings (SS) program was intended to build awareness of Ontario's growing summer electricity requirements and the need for conservation during these warm months when air conditioning use dramatically increases the demand for electricity. The program offered a financial incentive for consumers to reduce their electricity use in July and August.

The Summer Savings program sought to engage residential customers to reduce electricity consumption by 10 percent compared with their consumption in 2006, between July 1 and August 31st. If this reduction was achieved, consumers received a credit of 10 percent of their summer electricity bill costs on their September or next bill.

This program was delivered by Local Distribution Companies (LDCs) across Ontario. Customers' electricity consumption during the summer three-month period was compared to their 2006 consumption and uniformly corrected for variations in the weather. Those who reduced their consumption by 10 percent were automatically qualified for the 10-percent credit. No customer sign-ups were required.

Based on data from LDCs provided by the OPA, 858,093 customers qualified for the program and received bill credits worth approximately \$15.8 million. This represents approximately 21% of the 4.1 million residential customers in Ontario. On average, each of the qualifying customers reduced their summer-over-summer consumption by approximately 23% or roughly 430 kWh according to data provided by LDCs to the OPA. Based on these reported results, the gross summer energy savings achieved by the program are 369 GWh.

Approximately 88% of customers who received a bill credit were not "participants" in the SS program in that they were either not aware of the program or did not take specific actions in an effort to qualify for the program. Instead, it appears that they qualified due to random fluctuations in their consumption or to actions or other factors that were unrelated to the SS program. This is supported by NCI's finding that during the summers of 2004, 2005 and 2006 based on the same conditions as for the 2007 SS program, approximately 28% of customers would have randomly qualified for the bill credit if it had been offered under the same terms and conditions as for the 2007 SS.

Only about 30% of participants – defined as customers who were aware of the program and took specific actions in an effort to qualify for the program – actually received a bill credit; 70% did not. This indicates that a relatively small percentage of the incentives in this program were actually paid to participants, the remainder went to non-participants (free-riders).

Based on the estimated 9.2% participation rate taken from a survey of customers across Ontario, the estimated summer savings for participating customer is 31 GWh. This yields a net-to-gross ratio of just over 8% on summer savings relative to the reported summer saving of 369 GWh.

Relative to the program objectives, Navigant Consulting observes the following:

- The 2007 Summer Savings program was estimated to provide energy savings of approximately 145 GWh relative to a target of 146 GWh and realize summer peak demand savings of approximately 45 MW relative to a target of 46 MW.
- The program stimulated approximately 9% of eligible Residential Customers in Ontario to reduce their electricity consumption relative to the program target of 20%.
- Participants reduced their summer-over-summer consumption by just over 5% (compared with non-participants) relative to the program target of 10%.
- The program realized a 0.5% province-wide savings in residential usage during the Program Season (July 1st to August 31st, 2007) relative to a target of 2%.
- The program contributed to the culture of conservation by increasing awareness of the link between taking conservation actions and a corresponding reduction in summer energy bills among participants who qualified for the bill credit.

Our findings indicate that only a small percentage (less than 10%) of the savings attributed to the SS program could be attributed to other OPA residential programs.

Approximately 88% of customers who received a bill credit were not “participants” in the SS program in that they were either not aware of the program or did not take specific actions in an effort to qualify for the program. Instead, it appears that they qualified due to random fluctuations in their consumption or to actions or other factors that were unrelated to the SS program. Further, only about 30% of customers who were aware of the program or took specific actions in an effort to qualify for the program actually received a bill credit; 70% did not. This indicates that a relatively small percentage of the incentives in this program were actually paid to participants, the remainder went to non-participants (free-riders).

NCI notes that the design of the 2008 Summer Sweepstakes addresses this incentive “mismatch” issue by requiring customers to register for the program in order to be eligible to receive the bill credit if they qualify.

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INTRODUCTION

The report presents the results of Navigant Consulting's evaluation of the Ontario Power Authority's (OPA) 2007 Summer Savings program.

2007 Summer Savings Program Description

The 2007 Summer Savings (SS) program was intended to build awareness of Ontario's growing summer electricity requirements and the need for conservation during these warm months when air conditioning use dramatically increases the demand for electricity. The program offered a financial incentive for consumers to reduce their electricity use in July and August.

The Summer Savings program sought to engage residential customers to reduce electricity consumption by 10 percent compared with their consumption in 2006, between July 1 and August 31st. If this reduction was achieved, consumers received a credit of 10 percent of their summer electricity bill costs on their September or next bill.

This program was delivered by Local Distribution Companies (LDCs) across Ontario. Customers' electricity consumption during the summer three-month period was compared to their 2006 consumption and uniformly corrected for variations in the weather. Those who reduced their consumption by 10 percent were automatically qualified for the 10-percent credit. No customer sign-ups were required.

The OPA provided the necessary weather correction factors to be applied to both the 2007 consumption and the baseline 2006 consumption.

The objectives of the SS program were to:

- Stimulate at least 20% of the eligible Residential Customers in Ontario to reduce their electricity consumption by at least 10% during the Summer Program Season,
- Achieve a province-wide savings of 2% reduction in residential usage during the Program Season(July 1st to August 31st, 2007),
- Contribute to the culture of conservation by increasing awareness of the link between taking conservation actions and a corresponding reduction in summer energy bills, and
- Save roughly 146 GWH in energy savings and 46 MW of peak savings if the forecast of 20% participation is realized.

Overview of this Report

The subsequent sections of the report (this Introduction is the first) are organized as follows:

- The second section describes the survey of qualified and non-qualified customers and the sample frame for the surveys
- The third section presents NCI's analysis of the historical summer-over-summer changes of a large group of customers prior to 2007.
- The fourth section presents the estimated gross energy and demand savings for the program
- The fifth section presents the key elements underlying the net-to-gross determination for the program, such as free-ridership and spillover
- The sixth section presents the estimated net energy and demand savings for the program
- The seventh section presents NCI's conclusions and recommendations.

Appendix A describes the billing analysis undertaken by Navigant Consulting to determine how participants' various energy savings actions contributed to their overall savings. Appendix B contains a copy of the telephone survey of 2007 SS program participants and non-participants.

SURVEY OF QUALIFYING AND NON-QUALIFYING CUSTOMERS

A survey covering both qualifying and eligible, non-qualifying customers was conducted in May and June, 2008. One of NCI’s key program evaluation design features was the linkage of survey responses to customer consumption history. Part of the delay in conducting the survey was securing the necessary customer data from local distribution companies

Given the highly confidential nature of customer consumption history, Navigant Consulting entered into confidential “agency” agreements with four LDCs – from Southwestern, Central, Eastern and Northern Ontario – to undertake analysis of their customer data on their behalf. Aggregate results from this analysis were able to be shared with OPA, but under the terms of NCI’s agreement with the individual LDCs, no specific customer data could be shared with the OPA. Further, NCI has agreed to keep the names of the LDCs that generously shared their customer data with us confidential.

Each of the four LDCs provided a sample of approximately 600 qualifying customers and 600 eligible, non-qualifying customers and their associated customer consumption history. Consumption history came in variety of formats and at different stages of processing. All customer data was processed as required to yield weather adjusted summer 2006 and 2007 consumption as per the OPA’s SS rules, plus summer-over-summer % change in consumption.

In addition to surveying this sample of customers, NCI’s market research subcontractor also completed approximately 300 random surveys with residential customers in Toronto and another 300 in Ottawa.

Information regarding the breakdown of the 1,168 completed surveys by LDC and/or location is provided in Table 1.

Table 1: Completed Surveys by LDC

Respondent location	Total Surveyed
LDC A	143
LDC B	91
LDC C	202
LDC D	131
<hr/>	
<i>Subtotal: Respondents with Consumption Data</i>	<i>567</i>
Toronto	301
Ottawa	300
<hr/>	
<i>Subtotal: Respondents without Consumption Data</i>	<i>601</i>
Total Number of Respondents	1168

Note that NCI's original sample design has targeted completing surveys for approximately 2400 customers with matching consumption data versus the 567 actually completed, but the sample of customers available from the LDCs was insufficient to achieve this target. Overall, we were able to achieve a completion rate of over 10% among the customer sample provided to us by the LDCs, much better than the 5% typically achieved in other similar surveys.

Survey

The survey for qualifying and eligible, non-qualifying customers was identical and covered such topics as:

- The respondent's awareness of the SS program
- When the respondent first become aware of the program
- Whether or not the respondent qualified for the program
- Whether or not the respondent took specific actions to qualify for the program and if so
 - What specific actions were taken to qualify for the program (both behavioural and equipment-based actions were noted)
 - Whether or not these actions were also taken as part of respondent's participation in other programs, specifically other OPA programs (EKC, GRRP and HCS)
 - Likelihood of the respondent taking the action if the SS program had not been offered
 - (For those respondents who also undertook an action as part of another program), the relative influence of the other program in their decision to undertake the action
- Other actions taken that may have influenced consumption (this included the same list of possible actions as for SS and other program-related actions).
- Other changes in equipment and household characteristics that could have contributed to changes in their summer-over-summer consumption
- Respondent demographics

A copy of the survey is provided in Appendix B.

HISTORICAL SUMMER CONSUMPTION REVIEW

This review of historical summer savings values was undertaken in order to assess the likelihood that a residential customer would have qualified for the SS program by random chance given typical variations in year over year summer electricity consumption. This analysis was also intended to inform NCI's free rider estimate used in determining overall program savings, as well as other estimates of program efficacy.

Approach

Navigant Consulting received historical customer consumption data for each month between January 2003 and December 2007 for a random sample of 45,000 customers from an LDC in Southern Ontario. The sample customers were eligible to participate in the SS program and would have been eligible to participate in SS program in all prior three years (summers of 2004, 2005 and 2006) had it been offered. In other words, the sample represented customers who have not changed billing address since January 2003. Although there is clearly a bias in this sample towards relatively "long tenure" customers, Navigant Consulting is confident that the results presented below are a reasonable representation of the random, summer-over-summer fluctuation in weather-corrected consumption among residential customers in Ontario.

From this data, for each summer season between 2004 and 2006 inclusive (pre-Summer Savings Program kick-off), a summer savings electricity consumption amount for each customer was calculated.

Prorated summer savings for each residential customer were calculated using the methodology outlined in Appendix E of the OPA's Summer Savings Program document. Summer savings values were then weather corrected using normalization factors generously provided by Hydro One for each year between 2003 and 2007 using the same methodology as per the weather normalization factors used by LDCs in determining whether customers qualified for the SS program.

Summer 2004-2006 Results

For each of the 62 day prorated summer periods for the years between 2004 and 2006 inclusive, this analysis shows the percentage of customers that would have randomly qualified for a bill credit under the SS program rules (ie, reduced summer over summer consumption by more than 9.5%). The average reduction in consumption for those "qualifying customers" was also calculated.

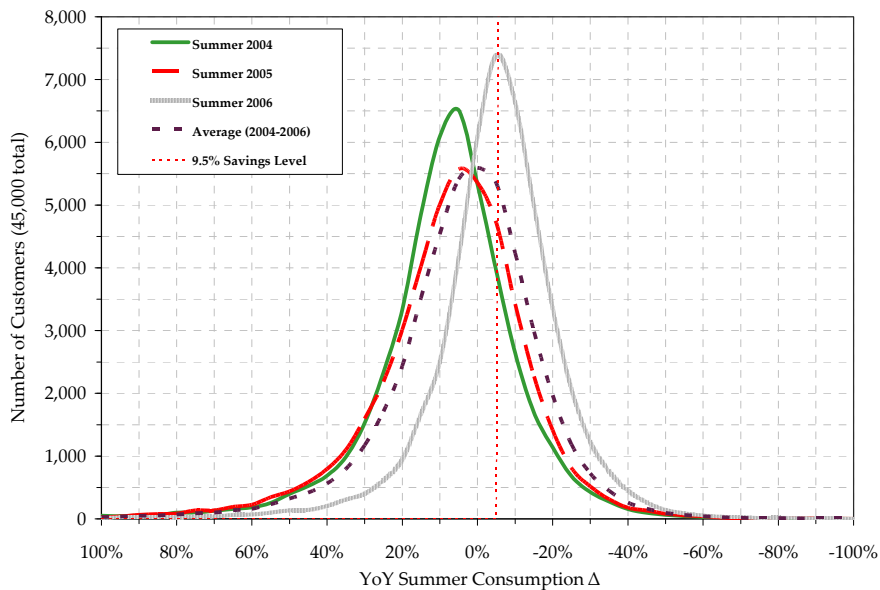
On average, across the three historical summer periods reviewed (2004 - 2006), 28.1% of residential customers would have qualified for a bill credit provided under the same rules as the 2007 SS program (ie, 28.1% reduced their weather-normalized consumption by more than 9.5%). The percentage of customers who would have randomly qualified varied from year to year, ranging from a low of 16.9% in 2004 to a high of 46.1% in 2006. In a given year, customers who qualified for an incentive consumed, on average, 20% less electricity when compared to their consumption over a previous summer season. Table 2 below summarizes the result of these calculations by year.

Table 2: % of Qualified and Non-Qualified Customers and Average Change in Summer Electricity Consumption

	Qualified				Non-Qualified
	2004	2005	2006	Average 2004-2006	Average 2004-2006
% of Customers	16.9%	21.4%	46.1%	28.1%	71.9%
YoY Summer Consumption Δ	-20.5%	-20.3%	-20.6%	-20.5%	11.3%

Figure 1, below illustrates the distribution of year-over-year variance in summer electricity consumption for the set of customers over each of the three summer periods and on average over the entire historical period analyzed (2004-2006).

Figure 1: Distribution of %-Change in Historical Summer Electricity Consumption



Detailed Summer 2004-2006 Statistics

From Figure 1, the mean change in historical residential customer summer consumption increased over both the summers of 2004, and 2005 and actually decreased in 2006. Over the entire sample of residential customer consumption reviewed, mean residential customer summer consumption increased by 7.2% and 6.8% over the summers of 2004 and 2005, respectively. In 2006, year over year summer consumption decreased by approximately 6.8%. Table 3, below outlines the mean, standard error, standard deviation, sample variance, and 95% confidence level for each summer season analyzed.

Table 3: Descriptive Statistics by Summer Season (2004-2006)

	Summer 2004	Summer 2005	Summer 2006
Mean	7.2%	6.8%	-6.8%
Standard Error	0.2%	0.7%	0.1%
Median	4.6%	2.9%	-8.3%
Standard Deviation	46%	159%	25%
Sample Variance	22%	252%	6%
Confidence Level (95%)	0.43%	1.46%	0.23%

An additional review of the summer savings data reveals that each of the distributions exhibit both positive kurtosis and skewness, i.e., they exhibit a higher level of variance in summer consumption within a lower distance of the mean and are positively biased (weighted towards a decrease in consumption rather than increase). The high level of kurtosis is most logically explained by the fact that most residential customers make only minor changes to their behaviour which have a small effect on summer electricity consumption; hence, the large number of customers highly centered about the mean. Table 4, below provides an overview of these two measures by each historical summer savings period.

Table 4: Skewness and Kurtosis by Summer Season (2004-2006)

	Summer 2004	Summer 2005	Summer 2006
Kurtosis	2.56	1.44	3.37
Skewness	1.90	1.64	2.08

GROSS ENERGY IMPACT

Based on data from LDCs provided by the OPA, 858,093 customers qualified for the program and received bill credits worth approximately \$15.8 million. This represents approximately 21% of the 4.1 million residential customers in Ontario based on the most recent data available from the Ontario Energy Board¹. The estimated customer population for the summer of 2007 was taken as the average of the reported year-end 2007 and 2006 data as available from the Ontario Energy Board.

On average, each of the qualifying customers reduced their summer-over-summer consumption by approximately 23% or roughly 430 kWh according to data provided by LDCs to the OPA.

Based on these reported results, the gross summer energy savings achieved by the program are:

858,093 qualifying customers x 430 kWh savings / qualifying customer

369,000,000 kWh

369 GWh

Note that these represent energy savings only during two summer months – July and August 2007. First year or annual savings and demand savings were not reported by LDCs for qualifying customers.

As described in *Historical Summer Consumption Review* on page 5, NCI's analysis of the random variation in summer-over-summer consumption for a large group of Ontario LDC residential customers for the summer of 2004, 2005 and 2006 indicates that approximately 28% of customers would have randomly qualified had the SS program been offered in these prior years. This finding suggests that a large number of qualified customers did not take specific actions to qualify for the program, but merely qualified through random fluctuations in their summer-over-summer consumption for other reasons. The net-to-gross analysis in the next section indicates that this was, in fact, the case and explores this issue in more detail.

¹ The spreadsheet with LDC customer counts and other information is available at:
<http://www.oeb.gov.on.ca/OEB/Industry+Relations/OEB+Key+Initiatives/Comparison+of+Electricity+Distributors+Costs>

NET-TO-GROSS ANALYSIS

This section presents the results of Navigant Consulting’s net-to-gross analysis for the 2007 SS program. Fundamental to our analysis is the definition of a program participant, which is described below. Based on this definition and the survey results, we estimated the participation rate among residential customers. The estimated summer kWh savings for participants versus non-participants were estimated based on the consumption history for each respondent. The participation rate and estimated savings for participants were then combined to estimate the overall summer savings and net-to-gross ratio attributable to the SS program.

Definition of “Participant”

For the purposes of our analysis, a program participant was defined as a respondent who stated that they:

1. Were aware of the SS program
2. Became aware of the SS program before the end of summer 2007 (or did not know when they became aware), and
3. Took actions to qualify for the program.

Note that this definition is completely independent of whether or not the respondent qualified for a bill credit. In other words, many participants may not have qualified for a bill credit and many respondents who qualified for a bill credit may not have been participants according to the above definition. NCI’s analysis indicates that this was, in fact, the case.

Note that approximately 35% of respondents determined to be participants based on the above definition did not know when they first became aware of the program (conversely 65% stated they became aware of the program before the end of summer 2007). Our analysis has indicated that this group was likely comprised of respondents who became aware before the end of the summer 2007 (ie, those would be defined as a participant) and those who became aware after the summer of 2007 (ie, those who would not be defined as a participant). The average savings for the larger group based on a “looser” definition of participant (ie, including respondents who did not know when they first become aware of the program) was somewhat lower than for the smaller group based on a “tighter” definition (ie, including only those who specifically stated that they were aware of the program before the end of summer 2007), but the number of “participants” was larger. Overall, the estimated program impact for either approach – larger number of participants including those who did not know when they first

become aware or smaller number of participants based only on those who were aware before the end of summer 2007 – is relatively similar. Given the passage of time from the summer of 2007 to the actual execution of the survey and the small difference in the overall impact under the two alternative approaches, NCI’s analysis was based on the definition given at the beginning of this section.

Participation Rate

NCI’s analysis indicates that just over 9% of eligible customers were participants based on the definition given above. Note that the sample of customers for whom consumption data was available from LDCs was comprised exclusively of eligible customers. Further, based on data provided to the OPA from LDCs, approximately 75% of all residential customers were eligible to qualify for the program. The specific eligibility requirements² for the program are:

- Residential customers, excluding seasonal accounts, recreational accounts, and individually or bulk metered multi-unit residential accounts.
- Active account with 12 months billing data at the same premise preceding the program season (July 1st 2006 to July 1st 2007) and an active account at the same premise for the full program season (July 1st 2007 to September 1st 2007).
- Base Year and Savings Year Meter Reads for Consumption Calculations
 - An actual as opposed to an estimated meter reading within a 75 day window prior to July 1st 2006.
 - An actual as opposed to an estimated meter reading within a 75 day window post September 1st 2006.
 - An actual as opposed to an estimated meter reading within a 75 day window prior to July 1st 2007.
 - An actual as opposed to an estimated meter reading within a 75 day window post September 1st 2007.
 - Alternatively, actual meter reads taken within the Program period for both the Base Year and Savings Year may be used as long as at least 75% of the Program period is represented by actual consumption data.

Interestingly, roughly 9% of residential customers surveyed in Toronto were determined to be participants. Given the random surveying technique used to identify these respondents, this

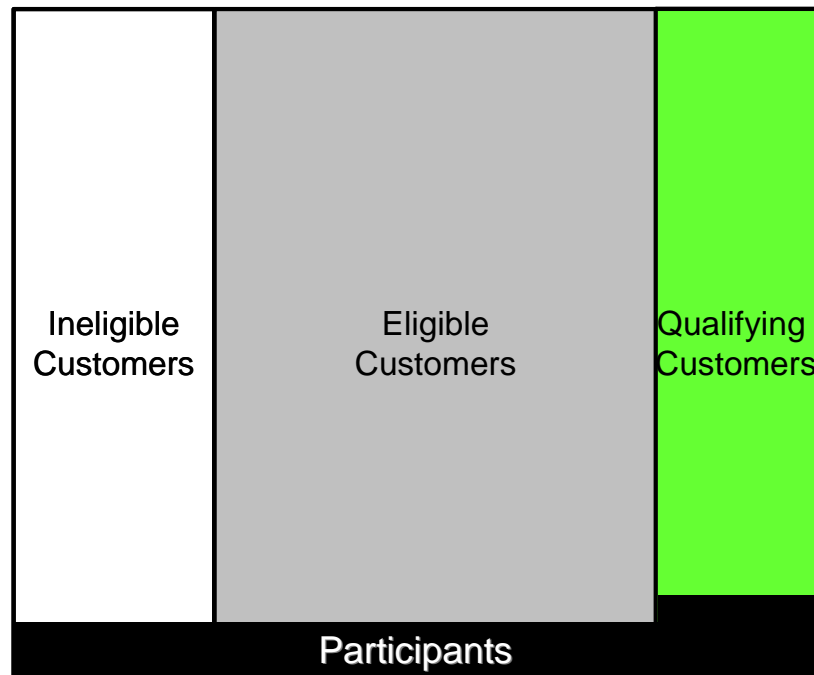
² Taken from *Appendix E: Summer Savings Program Methodologies*, issued as part of the original RFP for evaluation services related to the Summer Savings Program.

specific sample from Toronto and Ottawa comprised both eligible and ineligible customers. This suggests that customers who decided to participate were not aware that they needed to be eligible in order to qualify for the bill credit and that participants included both eligible and ineligible customers.

Many participants did not qualify for a bill credit. In fact, NCI estimates that only 40% of eligible participants qualified for the bill credit. Based on a 75% eligibility rate, this suggests that only 30% of participants (given that eligible participants = 75% of all participants) actually qualified for the program. The remaining 70% of participants did not qualify for the program.

This indicates that there was a significant mismatch between customers who qualified and received the bill credit and customers who were aware of the program and who tried to achieve the 10% reduction target. . This mismatch is shown schematically (and approximately to scale) in Figure 2.

Figure 2: Schematic Representation of Ineligible, Eligible and Qualified Customers versus Participants (roughly to scale)



As shown, approximately 75% of customers were eligible and approximately 21% of all customers qualified. Participants are spread across all of these groups, but there are relatively more participants in the qualified customer group because of the electricity savings actions these customers took.

Approximately 88% of customers who received a bill credit were not “participants” in the SS program in that they were either not aware of the program or did not take specific actions in an effort to qualify for the program. Instead, it appears that they qualified due to random fluctuations in their consumption or to actions or other factors that were unrelated to the SS program. Further, as stated above, only about 30% of customers who were aware of the program or took specific actions in an effort to qualify for the program actually received a bill credit, 70% did not. This indicates that a relatively small percentage of the incentives in this program were actually paid to participants, the remainder went to non-participants (free-riders).

Analysis of Participant / Non-Participant Characteristics

This section presents NCI’s findings on the analysis of characteristics of both participants and non-participants in the SS program based on their survey responses. Notably, only two primary differences were found. The first area of difference was household size and the second area of difference was income level.

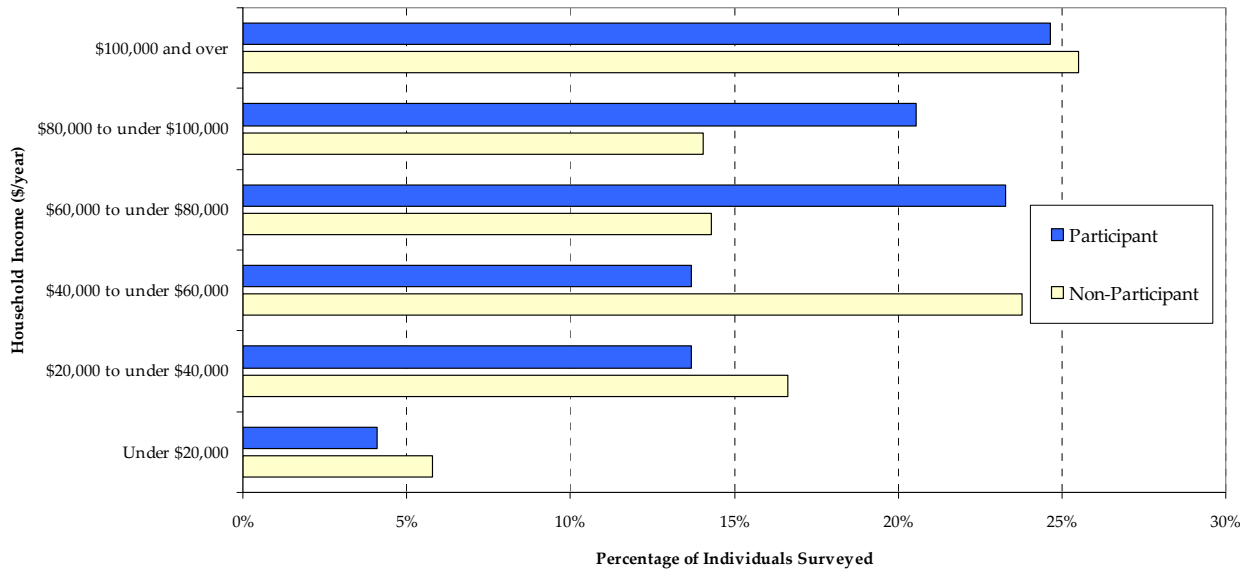
In terms of the number of individuals living in each home for both summer 2006 and summer 2007, as shown in Table 5, it is interesting to note that on average, participants had slightly larger household sizes with 3.3 individuals in comparison to non-participants with 2.8 individuals.

Table 5: Average number of individuals per household for both participants and non-participants during summer 2006 and summer 2007

	Summer 2006	Summer 2007
Participants	3.3	3.3
Non-Participants	2.8	2.8

The only other significant difference NCI identified between participants and non-participants was in terms of the household income distribution of participants and non-participants, Navigant determined relatively more participants had medium incomes (\$60,000 to \$100,000 annual household income) than non-participants. This is shown in Figure 3.

Figure 3: Income level distribution for participants versus non-participants



Based on these findings, NCI has determined that participants in the SS generally had larger household sizes and medium to medium-high household income levels (ie, \$60,000 to \$100,000 annually) compared with non-participants.

Net-to-Gross Summer Energy Savings Ratio

The average summer-over-summer change in consumption for all participants was approximately 5% lower than the average for non-participants, regardless of whether or not either group qualified for the bill credit. In essence, the electricity savings actions undertaken by participants reduced their consumption in the summer of 2007 by 5% relative to what it would otherwise have been. Given the various other factors affecting the summer-over-summer change for these participants, some participants actually experienced an increase in consumption, while others experienced a decrease. The 5.4% average reduction in consumption represents an 81 kWh reduction in summer consumption for participants relative to non-participants.

Given this and the 9.2% participation rate, the estimated summer savings for participants is:

4.1 million residential customers x 9.2% participation rate x 81 kWh savings
 380,000 participants x 81 kWh
 30,844,000 kWh
 31 GWh

Given the gross reported savings of 369 GWh shown in the Gross Energy Impact section on page 8, this yields a net-to-gross ratio of just over 8% on summer savings.

As discussed in the previous section, NCI's definition of "participant" includes respondents were aware of the program but who did not know when they became aware of the program. A similar analysis as above but limited only to those respondents who specifically stated they were aware of the program before the end of the summer of 2007 yields a participation rate of 6%, average savings of 107 kWh relative to non-participants and a net-to-gross ratio of 7%. As discussed, the two definitions of "participant" yield very similar results. Since it is likely that some of the respondents who did not know when they first became aware of the program actually became aware before the end of the summer of 2007, Navigant Consulting believes that the 8% net-to-gross is a reasonable estimate, particularly given the passage of time from the summer of 2007 to when the survey was conducted.

Confidence Interval for Net-to-Gross Summer Energy Savings Ratio

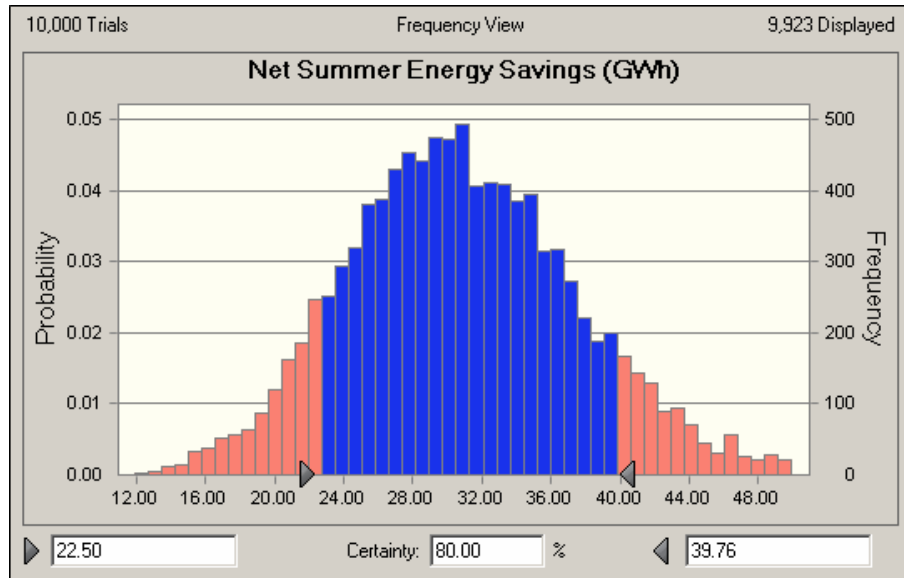
In order to quantify the confidence interval or potential range of uncertainty around the net summer energy savings and net-to-gross ratio presented herein, NCI undertook a Monte Carlo simulation analysis in which the key input parameters related to these estimates were randomly varied within a range informed by survey results and other information.

The net summer energy savings for the SS program is simply the product of the number of participants and the average level of savings for participants versus non-participants. Both of these numbers are estimates and there is uncertainty regarding their actual value. It is possible that the number of participants was different than our estimate. Similarly, it is possible that the average savings for participants was different than our estimate.

To account for the potential impact of this uncertainty, NCI undertook a Monte Carlo simulation (10,000 simulations) with the participation rate normally distributed about 9.2% with a standard deviation of 1% and the average savings per participant normally distributed about 81 kWh with a standard deviation of 15 kWh.

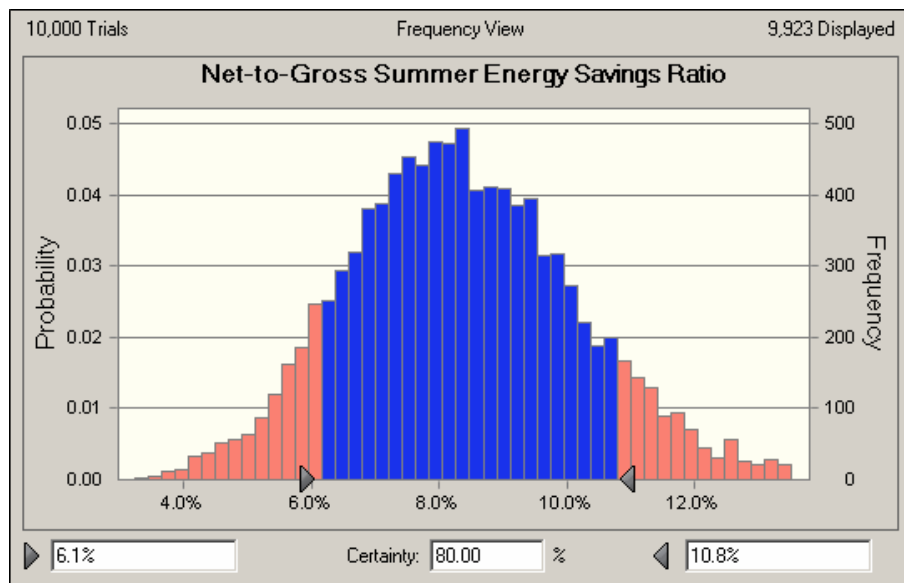
The results of this simulation are shown in Figure 4. The simulation indicates that there is a 90% probability that the net summer energy savings were at least 23 GWh. Alternatively, there is an 80% likelihood that the net summer energy savings for the 2007 SS program fell in the range of 23 GWh to 40 GWh. Our point estimate of the net summer energy savings falls roughly in the middle of this range.

Figure 4: Expected Range of Net Summer Energy Savings (GWh)



Corresponding results for the net-to-gross summer energy savings ratio are shown in Figure 5. As shown, there is a 90% probability that the net-to-gross summer energy savings ratio was at least 6%.

Figure 5: Expected Range of Net-to-Gross Summer Energy Savings Ratio



Influence of and Potential Attribution to other OPA Programs

Since other OPA conservation programs were also available to residential customers during the same period as the 2007 SS program, Navigant investigated whether any of the savings from the 2007 SS should be attributed to these other OPA programs. These other OPA residential programs were: 2007 Every Kilowatt Counts; 2007 Great Refrigerator Round Up Program; and 2007 Hot and Cool Savings Program.

Our findings, discussed in more detail below, indicate that only a small percentage (less than 10%) of the savings attributed to the SS could be attributed to other OPA residential programs. We have not adjusted our estimate of the SS impact to reflect this potential attribution.

For example, based on results from the survey, of the four possible actions that could be related the Every Kilowatt Counts program, 16% of participants who reported taking one or more of these actions stated that their action was either partially or directly a result of the EKC program. Based on these participants' responses to other survey questions about the relative influence of the EKC program and what they would have done if the EKC program had not been available, NCI estimates that 60% of the actions from these participants could be attributed to the EKC program (see Figure 6 above). Multiplying these two factors together, we have concluded that approximately 9.6% ($16\% \times 60\% = 9.6\%$) of all the energy savings actions undertaken by SS participants that could potentially be associated with the EKC program could be attributed to the EKC program. A similar methodology was applied to the actions related to the two other OPA programs and shown in Table 6, however none of the participants stated that their action was either partially or directly a result of other OPA programs.

Table 6: Potential Attribution to other OPA programs

Related OPA Program	Actions related to Other Program	% of Respondents Indicating Action was Partially or Directly Due to Other Program	Weighted Average "Net Attribution Rate" to Other Programs	% of Energy Savings from Actions Attributable to Other Programs
2007 Every Kilowatt Counts Program	4	16%	60%	9.6%
2007 Great Refrigerator Round-Up Program	1	0%	56%	0%
2007 Hot and Cool Savings Program	3	0%	67%	0%

NET ENERGY AND PEAK DEMAND IMPACT

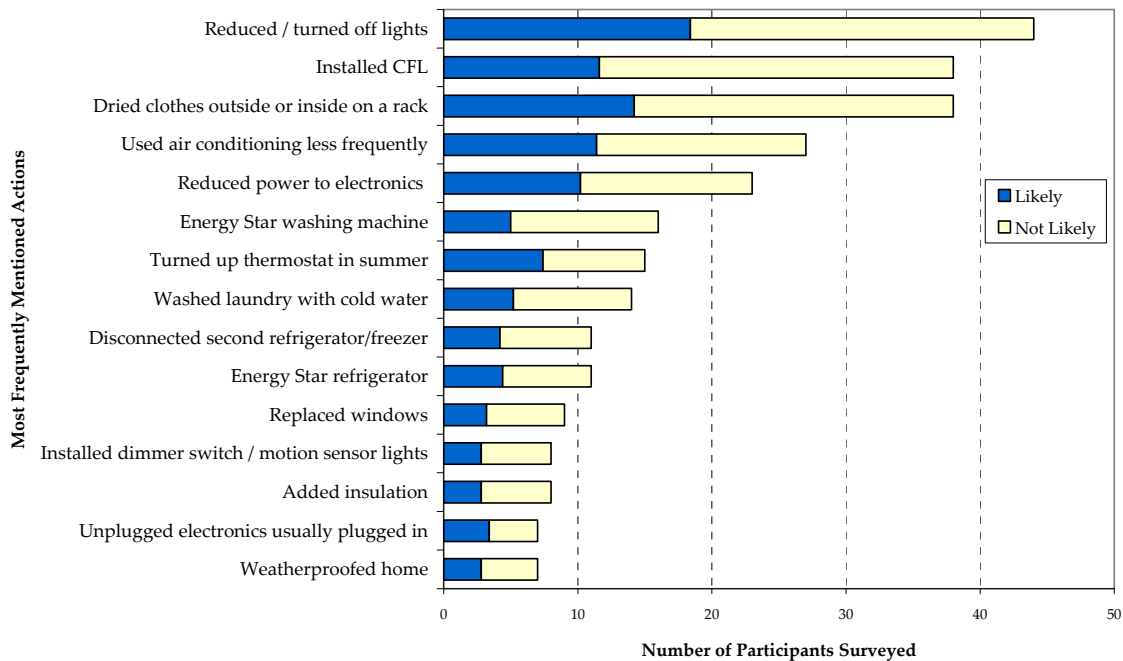
This section presents NCI’s findings on the net energy and peak demand impact for the 2007 SS program.

As discussed in the previous chapter, NCI estimates that approximately 380,000 customers in Ontario were aware of the SS program and took various actions in an effort to qualify for the program. The first year and annual net energy savings and net demand impact for the SS program are dependent upon the relative energy and demand impacts of the various actions that these SS participants took in order to qualify for the program.

Energy Saving Actions Undertaken by Participants

The most frequently mentioned actions participants reported taking are shown in Figure 6. As shown below, reducing and turning off lights, installing CFLs and drying clothes outside were the most frequently mentioned actions. Note, also, that some of the actions relate to major equipment purchases or major retrofits, such as purchasing an Energy Star washing machine, replacing windows and adding insulation.

Figure 6: Frequency and likelihood of taking action in absence of SS program



The blue portion of the bars shown in Figure 6 indicates the percentage of each action that respondents indicated that they would have undertaken in the absence of the SS program. In other words, the blue portion of each bar represents the “free-ridership” rate for each action.

Action-Specific Free-Ridership Determination

The free-ridership rate for each action was determined based on each respondent’s reported likelihood of taking that specific action had then been no SS program. For example, looking at those participants who said that they reduced or turned off lights as an action in Table 7, responses varied between “extremely likely” and “not at all likely”. Navigant assigned a corresponding free-ridership percentage to each response category, such that a 80% free-rider corresponded to all participants who stated that they were “extremely likely” to reduce or turn off their lights had there been no program and a 0% free-rider corresponded to all participants who stated that they were “not at all likely” to reduce or turn off their lights in the absence of the program. Those individuals whose responses would not categorize them clearly as either 0% free-riders or 80% free-riders were assigned partial free-ridership percentages. Finally, the weighted average of participants’ responses along with their corresponding free-ridership percentage was determined, resulting in a free-ridership rate for this action of 58%.

Table 7: Methodology for Determining Free-Ridership Rate for “Reducing or Turning off Lights” Action

Likelihood of Taking Action in Absence of SS Program	Number of Responses	NCI Assigned Free-Ridership Percentage
Extremely Likely	19	80%
Very Likely	10	60%
Somewhat Likely	8	40%
Not Very Likely	6	20%
Not Likely at All	1	0%
Weighted Average Free-Ridership for Action		58%

Billing and Regression Analysis Overview

To estimate the impact of the various actions that participants took on their summer and annual consumption, a billing and regression analysis was undertaken on the subset of survey respondents for whom historical consumption information was available. We specified a fixed-effects regression model, which was ideally suited to the time-series cross-sectional data available. In this case, a time-series dataset was constructed using prorated customer summer

consumption data for 2006 and 2007, which was then matched to a corresponding set of dummy variables. The results of the customer survey were deconstructed to produce what was determined to be a minimally correlated set of dummy variables based on their survey responses related to respondents actions (eg, “*purchased a new Energy Star air conditioner*” or “*used air conditioning less*”). Ultimately, the various survey variables were combined or eliminated resulting in the 42 coefficients estimated in Appendix A of this report.

A review of the results of this regression analysis revealed few significant estimators at even the 10% significance level. However, with so many potential actions responsible for variance in customer electricity consumption between 2006 and 2007 not captured or included in the analysis one would expect to see few significant results. It is also likely that factors not captured in the survey responses and resultant dummy variables contributed to the year-over-year savings. Given that no independent variables were able to fully account for these other factors, the regression model attempted to explain all of the variability with the dummy variables provided.

Net Energy and Peak Demand Impact

NCI relied on the results of our billing and regression analysis to estimate the relative contribution of each of these actions to the estimated 81 kWh in summer savings for participants. The analysis was also used to determine the annual savings and lifetime savings realized by participants.

Note that NCI has a high degree of confidence in the estimated summer savings for participants based on the relatively large sample of customers (both participants and non-participants) for whom billing data was available. This analysis was also relatively “binary” – customers were either participants or they were not – and the difference between the change in summer-over-summer consumption for these two groups was determined.

For the analysis described below – specifically estimation of annual savings, lifetime savings and peak demand impact – NCI has relatively less confidence given the data available. While the regression analysis yielded statistically significant savings coefficients for some of the actions, non-statistically significant coefficients were estimated for many of the actions. NCI used its best professional judgement in these cases to estimate the most appropriate coefficients for these actions.

Further, the relative influence and contribution of major equipment purchases in the savings for participants was uncertain. Even though a participant may have said they insulated their home in an effort to qualify for the SS, it is hard to imagine someone spending perhaps \$2000 in an effort to get a \$30 bill credit. Given this uncertainty, Navigant Consulting explored three

possible scenarios with respect to the impact of major equipment purchases on the overall impact of the SS program:

1. Only behavioural change actions were assumed to contribute to the savings and these behavioural changes were only assumed to persist for one year.
2. Major equipment purchases were assumed to be “pulled forward” by two years from when they would otherwise have been made. Hence, the estimated savings for these equipment purchases were only counted for two years and the “cost” of the early action was taken to be the present value cost of making the purchase in 2007 versus 2009³
3. All major equipment purchases with an estimated cost greater than \$100 were assumed to change from “standard” to “higher efficiency” models due to the SS program. The incremental cost for the higher efficiency model (of a refrigerator for example) was assumed to be 15% of the standard equipment purchase cost. The incremental energy savings associated with the higher efficiency equipment purchase were then assumed to last for the life of the particular equipment associated with the action. The annual savings for Energy Star refrigerators over non-Energy Star equipment were taken from the OPA’s Measures and Assumptions. The analogous savings for Energy Star central air conditioning over non-Energy Star central air conditioning and the savings associated with the installation of a programmable thermostat were taken from the NCI’s recently completed evaluation of the OPA’s Hot and Cool Savings program.

The three different scenarios above yield very different participant costs. In scenario 1 in which only behaviour changes are assumed to contribute to the savings, the participant cost was essentially zero. For scenarios 2 and 3, the estimated participant costs are significant, but the annual savings for the program are expected to persist for longer.

Note that in all cases, the summer energy savings for a given action are based on the product of:

1. The estimated number of actions (taken from the survey results and extrapolated to the entire province based on the estimated participation rate) x

³ The present value impact of a purchase that is made two years before it otherwise would be made can be estimated as $(1 - 1 / (1 + \text{discount rate})^2) = 0.075$ based on a 4% discount rate. In other words, the present value impact of purchasing something two years earlier than it would otherwise be purchased is 7.5% of the cost of the equipment using a 4% discount rate..

2. The estimated savings (kWh) for that action (taken from the regression results or based on NCI’s professional judgement [or other OPA measures and assumptions information in the case of certain actions under scenario 3]) x
3. (1 – free-ridership % attributable to that action) (as shown in Figure 6)

The aggregate summer saving across all actions were then scaled up or down accordingly to yield the estimated average 81 kWh summer savings for participants.

The peak impact of the program was based on the end-use affected by each action and the end-use load profile developed by the OPA.

The annual energy savings, lifetime energy savings and summer peak demand impact for each of the three scenarios considered are shown in Table 8.

Without having any information from participants regarding which of the three scenarios are most reflective of what they actually did (ie, to what extent they purchased equipment to qualify for the program and whether they simply purchased efficient equipment earlier than they otherwise would have or whether the purchased more efficient equipment than they otherwise would have), we simply present an average of the three scenarios on the simple assumption that each of the three scenarios is equally probable. As shown, the annual energy savings from the SS program are estimated to be 81 GWh, the lifetime savings are estimated to be 145 GWh and the summer peak demand savings are estimated to be 45 MW.

Table 8: Estimated Net Energy and Demand Savings

<i>Scenario</i>	<i>Annual GWh</i>	<i>Lifetime GWh</i>	<i>Summer Demand Savings (MW)</i>
1	84	84	45
2	73	117	45
3	87	236	46
Average	81	145	45

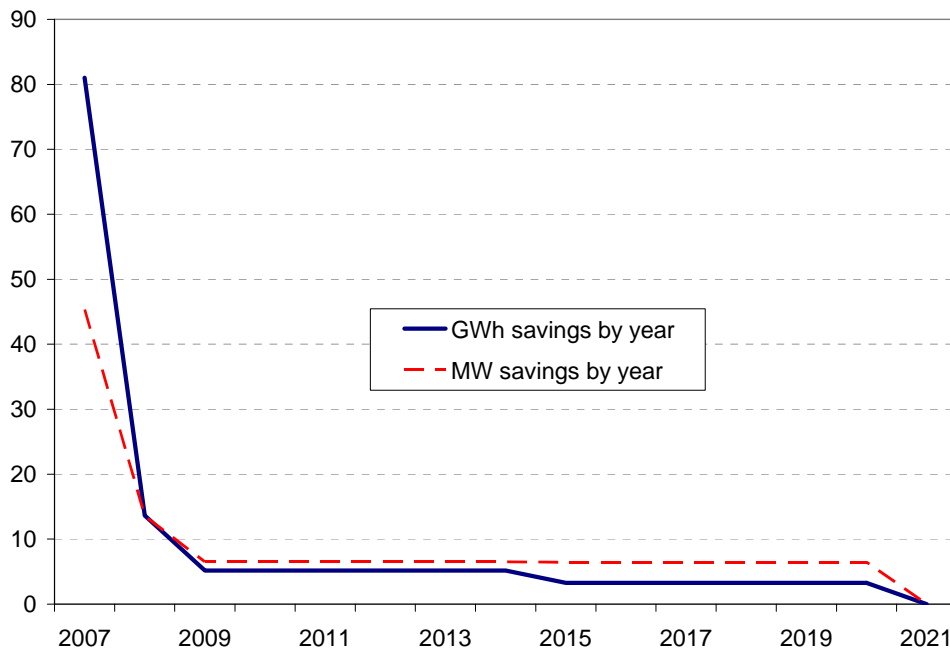
For all of the scenarios considered, the demand impacts for the program are largely driven by air conditioning-related actions. As a result, the SS program has a relatively high demand / energy savings ratio compared with other programs that target less summer demand intensive end-uses such as lighting.

The lifetime energy savings vary significantly across the scenarios, due to the different lifetime assumed for the equipment-related actions – two years in the case of scenario 2 and 14 years in

scenario 4 (based on the average life of the various equipment / major retrofits included as actions taken by SS participants). In scenario 2 and 3, roughly 70% of the initial savings are estimated to be due to behaviour changes which explains why the lifetime savings are less than two and five times the annual savings for these two scenarios. In other words, even when the impact of major equipment changes are considered in the savings, behaviour changes are still estimated to have contributed the majority (70%) of the first year savings. Additionally, Navigant Consulting has determined that the higher lifetime savings when the impact of equipment changes are included are more than offset by the costs associated with these equipment purchases.

The forecast persistence of energy and demand savings for the average of the three scenarios discussed above is presented in Figure 7. As shown the savings are forecast to drop off significantly after the first year, but then remain relatively constant over the next thirteen years due to the impact of energy efficient equipment purchases assumed in Scenario 3 (Note that this impact is based on average of the three scenarios considered – if the savings were fully reflective of Scenario 3 the longer term savings would be approximately three times higher).

Figure 7: Forecast Persistence of Energy and Demand Savings



CONCLUSIONS AND RECOMMENDATIONS

Based on data from LDCs provided by the OPA, 858,093 customers qualified for the program and received bill credits worth approximately \$15.8 million. This represents approximately 21% of the 4.1 million residential customers in Ontario. On average, each of the qualifying customers reduced their summer-over-summer consumption by approximately 23% or roughly 430 kWh according to data provided by LDCs to the OPA. Based on these reported results, the gross summer energy savings achieved by the program are 369 GWh.

Approximately 88% of customers who received a bill credit were not “participants” in the SS program in that they were either not aware of the program or did not take specific actions in an effort to qualify for the program. Instead, it appears that they qualified due to random fluctuations in their consumption or to actions or other factors that were unrelated to the SS program. This is supported by NCI’s finding that during the summers of 2004, 2005 and 2006 based on the same conditions as for the 2007 SS program, approximately 28% of customers would have randomly qualified for the bill credit if it had been offered under the same terms and conditions as for the 2007 SS.

Only about 30% of participants – defined as customers who were aware of the program and took specific actions in an effort to qualify for the program – actually received a bill credit; 70% did not. This indicates that a relatively small percentage of the incentives in this program were actually paid to participants, the remainder went to non-participants (free-riders).

Based on the estimated 9.2% participation rate taken from a survey of customers across Ontario, the estimated summer savings for participating customer is 31 GWh. This yields a net-to-gross ratio of just over 8% on summer savings relative to the reported summer saving of 369 GWh.

Relative to the program objectives, Navigant Consulting observes the following:

- The 2007 Summer Savings program was estimated to provide energy savings of approximately 145 GWh relative to a target of 146 GWh and realize summer peak demand savings of approximately 45 MW relative to a target of 46 MW.
- The program stimulated approximately 9% of eligible Residential Customers in Ontario to reduce their electricity consumption relative to the program target of 20%.
- Participants reduced their summer-over-summer consumption by just over 5% (compared with non-participants) relative to the program target of 10%

- The program realized a 0.5% province-wide savings in residential usage during the Program Season (July 1st to August 31st, 2007) relative to a target of 2%.
- The program contributed to the culture of conservation by increasing awareness of the link between taking conservation actions and a corresponding reduction in summer energy bills among participants who qualified for the bill credit.

Our findings indicate that only a small percentage (less than 10%) of the savings attributed to the SS program could be attributed to other OPA residential programs.

NCI notes that the design of the 2008 Summer Sweepstakes addresses this incentive “mismatch” issue by requiring customers to register for the program in order to be eligible to receive the bill credit if they qualify.

Recommendations

Based on lessons learned in evaluating the 2007 Summer Savings program, NCI offers the following suggestions for evaluation of the 2008 Summer Sweepstakes program:

1. A large random representative sample of 1,200 registered and 1,200 non-registered customers should be surveyed and their summer-over-summer change in consumption explored through comparison of their historical consumption patterns. The large sample is required to ensure statistically significant results with respect to differences between the summer-over-summer consumption change between registered and non-registered customers.
2. Customers should be categorized as participants and non-participants based on whether they were aware of the program before the end of summer and took specific actions to qualify for the bill credit. Note that it is possible that non-registered customers may have taken such actions and would be deemed as participants. Conversely, it is also possible that registered customers may not have taken any actions to qualify for the bill credit and could be considered as non-participants.
3. The survey should explore the nature of any equipment-related actions that participants took to estimate the incremental cost and associated measure life. Ideally, the survey would allow determination of whether equipment purchases were simply pulled forward in time or if energy-efficient equipment was purchased in lieu of standard efficiency equipment.
4. In lieu of regression analysis, estimates of the impact of the various actions should be based, to the degree possible, on other OPA analysis.

APPENDIX A: BILLING ANALYSIS

Approach

Three LDCs in southern Ontario and one in northern Ontario provided Navigant Consulting with residential customer summer savings consumption data for just over a total of 1600 eligible customers. The data received was assumed to have been weather normalized according to the methodology outlined in Appendix E of the Summer Savings Program Methodology document as published by the OPA. Each customer's consumption data was also assumed to have been prorated according to the methodology outlined in Appendix E of the above document, thus eliminating the need to account for differences in billing period dates and ultimate differences in weather. This consumption data was then matched to survey responses, where available, for those non-participating customers who were eligible for a financial incentive and all those customers who indicated that they were participants. This ultimately resulted in a sample size of 270 customers and associated survey and summer consumption data.

Given the calculated change in year over year summer electricity consumption and the results of the participant survey which indicate year over changes in customer behaviour, a time-series cross-sectional dataset was created for use in further analysis.

The billing analysis was undertaken using a fixed-effects regression model for time-series cross-sectional data, which is ideally suited to estimating these types of data.

However, prior to this estimation an initial approach focused on the use of an ordinary least squares (OLS) regression model which attempted to estimate the %-change in year over year consumption. The results of this analysis were insignificant and provided no explanatory power, mainly an impact of the normalizing effect the %-change in consumption has versus year over year absolute savings values.

Billing Analysis Limitations

Initial estimates, based on data provided to the OPA by participating LDCs, indicate that upwards of 850,000 residential customers were eligible to participate in the Summer Savings Program. However, the sample size of customers in this analysis was limited to those 270 discussed above, which imposes a significant constraint on the usefulness of the results presented in forthcoming sections. Further reflected in the results of this analysis are those actions not captured by the survey that also have a significant limiting impact on measuring changes in year over year consumption; technically referred to as omitted variable bias.

Regression Model Specification

The fixed-effects estimator, in general, takes the form shown below in Figure 8, where y_{it} is the dependent variable, in this case the annual summer savings period consumption in kWh, for individual i at time t . The Beta (β) is the vector of coefficients and x_{it} is the set of regressors for the same individual and time, and in this case is based fully on the results of the survey. Finally, μ_{it} is the error term for a given individual and time. The term ‘balanced’ refers to the fact that each of the individual terms contain the same number of time-varying terms, i.e., for each of the 270 customers under review, each had a summer consumption data point for both 2006 and 2007.

Figure 8: Basic Regression Model for a (Balanced) Panel Data Set

$$y_{it} = x_{it}\beta + \mu_{it} \quad i = 1, \dots, N; t = 1, \dots, T$$

The fixed-effects estimator ultimately attempted to determine a coefficient for each of the explanatory variables specified in the model, which were represented by binary variables almost entirely. Several variables were represented by scalar values, including: changes in weeks away; and, change in number of occupants. A number of the variables shown below in Table 9 were computed using the results of multiple questions, both in order to maximize their usefulness and to minimize the effect correlated variables have on each other in this type of a regression analysis. Explanatory variables were derived from the survey and are comprised of the following 42 variables, shown below in Table 9.

Table 9: Survey-Derived Set of Explanatory Variables

Variable	Definition	Variable	Definition
E_G_FS_WH	electric to gas fuel switching for water heater	G_E_FS_STOVE	gas to electric fuel switching for stove
E_G_FS_SPA	electric to gas fuel switching for pool/spa	G_E_FS_DRYER	gas to electric fuel switching for dryer
E_G_FS_STOVE	electric to gas fuel switching for stove	G_E_FS_HEAT	gas to electric fuel switching for heating system
E_G_FS_DRYER	electric to gas fuel switching for dryer	MORE_OCCUPANTS	Increase in 2007 Consumption: more occupants at home
E_G_FS_HEAT	electric to gas fuel switching for heating system	AWAY_LESS	Increase in 2007 Consumption: went away less
E_G_FS_OTHER	electric to gas fuel switching for other	CHANGE_IN_OCCUPA	Change in occupants living at home between 2007 and 2006
LESS_AC_USAGE	Used AC less in 2007 in comparison to 2006	CHANGE_IN_AWAY_W	Change in weeks away between 2007 and 2006

Variable	Definition	Variable	Definition
MORE_AC_USAGE	Used AC more in 2007 in comparison to 2006	Q6_11_14_ATTIC_FAN	Install a new attic fan
THSS_PARTICIPANT	participated in similar program in 2006	Q6_11_14_AC	Install a new air conditioner
THSS_SUCCESS	Successful in receiving credit in 2006 program (reduced 10%)	Q6_11_14_DW	Install a new dishwasher
Q19_DW_ELEC_WH	New action Q19, dish washer replacement, has electric water tank	Q6_11_14_DW_ELEC_WH	Install a new dishwasher and electric water heater
Q19_WASHER_ELEC_WH	New action Q19, washing machine replacement, has electric water tank	Q6_11_14_ELEC_WH	Install a new electric water heater
NEW_CAC	Increase in 2007 Consumption: added new CAC	Q6_11_14_FREEZER	Install a new freezer
NEW_ROOM_AC	Increase in 2007 Consumption: added new room AC	Q6_11_14_FRIDGE	Install a new refrigerator
NEW_DESKTOP	Increase in 2007 Consumption: added new desktop computer	Q6_11_14_WASHER	Install a new washing machine
NEW_LAPTOP	Increase in 2007 Consumption: added new laptop computer	Q6_11_14_WASHER_ELEC_WH	Install a new washing machine and electric water heater
NEW_TV	Increase in 2007 Consumption: added new TV	Q6_11_14_REDUCE_AC	Reduce power used for air conditioning
NEW_DH	Increase in 2007 Consumption: added new dehumidifier	Q6_11_14_BLDG_EFFICIENCY	Improve efficiency of your building's shell
NEW_VIDEO_EQUIP	Increase in 2007 Consumption: added new video equip	Q6_11_14_REDUCE_WH	Reduce water heater or dryer usage
G_E_FS_WH	gas to electric fuel switching for water heater	Q6_11_14_TURN_OFF_LIGHTS	Reduce usage of lights or electronics
G_E_FS_SPA	gas to electric fuel switching for pool/spa	Q6_11_14_UNPLUG_APPL	Disconnect or get rid of any appliances or electronics

Given the above set of explanatory variables or regressors, the model specified in this analysis ultimately took the form shown below in Figure 9 (abbreviated for convenience). However, the intention of this billing analysis is not to develop an estimate of household consumption for those qualifying customers, but rather to develop an estimate for each of the eligible actions that those given customers took.

Figure 9: Abbreviated Fixed-Effects Estimator

$$\begin{aligned}
 CONSUMPTION_{it} = & E_G_FS_WH_{it}\beta_1 + E_G_FS_SPA_{it}\beta_2 + \dots \\
 & + Q6_11_14_UNPLUG_APPL_{it}\beta_{42} + \mu_{it}
 \end{aligned}$$

Regression Results

Table 10 below, outlines the set of coefficients determined as a result of the analysis. Also included for further discussion are the standard errors, t-statistics, and significance of each coefficient.

Table 10: Resulting Regression Estimators

Panel Regression - Estimation by Fixed Effects				
Dependent Variable CONSUMPTION				
Panel(2) of Annual Data From 1//2006:01 To 270//2007:01				
Usable Observations	540	Degrees of Freedom	235	
Centered R**2	0.909695	R Bar **2	0.792874	
Uncentered R**2	0.977560	T x R**2	527.883	
Mean of Dependent Variable	1533.3119084			
Std Error of Dependent Variable	882.5001792			
Standard Error of Estimate	401.6356788			
Sum of Squared Residuals	37908136.353			
Regression F(304,235)	7.7871			
Significance Level of F	0.00000000			
Log Likelihood	-3779.18575			
Variable	Coeff	Std Error	T-Stat	Signif

1. E_G_FS_WH	-165.7441061	334.3657831	-0.49570	0.62057146
2. E_G_FS_SPA	0.0000000	0.0000000	0.00000	0.00000000
3. E_G_FS_STOVE	216.9586950	279.2890356	0.77682	0.43804327
4. E_G_FS_DRYER	257.5702885	440.9338472	0.58415	0.55968157
5. E_G_FS_HEAT	251.7567839	441.4497389	0.57030	0.56902216
6. E_G_FS_OTHER	154.6795627	431.5640486	0.35842	0.72035360
7. LESS_AC_USAGE	-133.1905209	91.5834020	-1.45431	0.14719508
8. MORE_AC_USAGE	90.9433256	125.7388965	0.72327	0.47023254
9. THSS_PARTICIPANT	159.4823518	145.9476046	1.09274	0.27562821
10. THSS_SUCCESS	-620.9992716	340.6626714	-1.82292	0.06958679
11. Q19_DW_ELEC_WH	0.0000000	0.0000000	0.00000	0.00000000
12. Q19_WASHER_ELEC_	0.0000000	0.0000000	0.00000	0.00000000
13. NEW_CAC	-530.0807253	412.7469353	-1.28428	0.20031026
14. NEW_ROOM_AC	-140.3326375	597.0744184	-0.23503	0.81438721
15. NEW_DESKTOP	227.8088392	579.6601615	0.39300	0.69467270
16. NEW_LAPTOP	-591.6149843	415.7912975	-1.42287	0.15610134
17. NEW_TV	-219.1256335	571.7913139	-0.38323	0.70189821
18. NEW_DH	55.7758203	572.3723250	0.09745	0.92245468
19. NEW_VIDEO_EQUIP	0.0000000	0.0000000	0.00000	0.00000000
20. G_E_FS_WH	114.8918449	599.8851571	0.19152	0.84828119
21. G_E_FS_SPA	433.2834389	588.5299181	0.73621	0.46233526
22. G_E_FS_STOVE	-4.4923441	573.2518526	-0.00784	0.99375401
23. G_E_FS_DRYER	25.0037901	830.0090456	0.03012	0.97599315
24. G_E_FS_HEAT	0.0000000	0.0000000	0.00000	0.00000000
25. MORE_OCCUPANTS	0.0000000	0.0000000	0.00000	0.00000000
26. AWAY_LESS	0.0000000	0.0000000	0.00000	0.00000000
27. CHANGE_IN_OCCUPA	101.0652199	48.6103222	2.07909	0.03869405
28. CHANGE_IN_AWAY_W	6.6150148	15.0024679	0.44093	0.65967017
29. Q6_11_14_ATTIC_F	60.3459344	219.0424019	0.27550	0.78317508
30. Q6_11_14_AC	-402.1256094	139.1679515	-2.88950	0.00421935
31. Q6_11_14_DW	158.3065301	144.0676396	1.09883	0.27296463
32. Q6_11_14_DW_ELEC	171.9209450	325.2419141	0.52859	0.59758594
33. Q6_11_14_ELEC_WH	-59.3068111	189.8562503	-0.31238	0.75503069
34. Q6_11_14_FREEZER	-19.9424945	142.9267437	-0.13953	0.88915127
35. Q6_11_14_FRIDGE	-210.4987036	100.6080760	-2.09226	0.03748822
36. Q6_11_14_WASHER	189.5563671	115.4575552	1.64178	0.10197231
37. Q6_11_14_WASHER_	-156.2540284	248.0244760	-0.62999	0.52931033
38. Q6_11_14_REDUCE_	-11.4533434	95.7088018	-0.11967	0.90484787
39. Q6_11_14_BLDG_EF	-290.8501365	100.6246037	-2.89045	0.00420707
40. Q6_11_14_REDUCE_	0.0000000	0.0000000	0.00000	0.00000000
41. Q6_11_14_TURN_OF	36.8815237	99.1029763	0.37215	0.71011391

42. Q6_11_14_UNPLUG_	70.6733124	100.1932833	0.70537	0.48127873
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While the resulting estimators of this model appear to explain 85% (adjusted R-squared value) of the year over year change in summer residential customer electricity consumption, a large number of the estimators are highly insignificant.

In attempting to explain each of the actions undertaken by customers in this analysis, a point to consider is that both household summer electricity consumption and summer savings values vary widely across households as was seen in Figure 1 on page 6. Further, a given measure has a very different impact in one household than it does in another; hence, the low degree of significance in estimates of program-related actions.

Table 11 below provides an extract of those explanatory variables that the regression model was able to determine to an acceptable degree of significance, e.g., within or close to being within the 10% significance level.

Table 11: Explanatory Variables Significant at the 10% Level

Variable	Coeff	Std Error	T-Stat	Signif

10. THSS_SUCCESS	-620.9992716	340.6626714	-1.82292	0.06958679
27. CHANGE_IN_OCCUPA	101.0652199	48.6103222	2.07909	0.03869405
30. Q6_11_14_AC	-402.1256094	139.1679515	-2.88950	0.00421935
35. Q6_11_14_FRIDGE	-210.4987036	100.6080760	-2.09226	0.03748822
36. Q6_11_14_WASHER	189.5563671	115.4575552	1.64178	0.10197231
39. Q6_11_14_BLDG_EF	-290.8501365	100.6246037	-2.89045	0.00420707

APPENDIX B: SUMMER SAVINGS TELEPHONE SURVEY

Survey included in the following pages.

Summer Savings Challenge Telephone Survey

FINAL – May 5, 2008

IF USING CUSTOMER CONTACT DETAILS FROM LDC INCLUDE DATA FIELD “CREDIT” -- = YES if received 10% bill credit (reduced electricity use by at least 10% in summer 2007 versus summer 2006)

SECTION 1 - SCREENER

Good morning/afternoon/evening.

[IF CONTACT NAME IS AVAILABLE] May I please speak with [INSERT NAME]?

[IF CONTACT NAME IS UNAVAILABLE] I'd like to speak with the person who would be most familiar with or knowledgeable about the energy use in your home, and your electric bill? Would that be you?

[IF NO / REFUSED] Could I please speak with the person who is most familiar with or knowledgeable about the energy use in your home, and your electric bill?

[If appropriate person is not available, schedule callback]

[ONCE APPROPRIATE PERSON IS ON THE PHONE] My name is _____. I'm calling from The Logit Group, a public opinion and marketing research firm, on behalf of your utility company [INSERT UTILITY NAME FROM DATABASE] and the Ontario Power Authority. Our firm has been commissioned to conduct an important survey. The information you provide will help the Ontario Power Authority and your utility company [INSERT UTILITY NAME FROM DATABASE] to evaluate the effectiveness of their current rebate program and improve services to residential customers like you. Please, be assured that we are not selling anything. Your participation in the study will in no way result in sales or solicitation calls.

1. We are interested in people's occupations, do you or does anyone in your household, work for any of the following types of companies...?

	<u>Yes</u>	<u>No</u>
An advertising agency or public relations firm	<input type="checkbox"/>	<input type="checkbox"/>
A market research company	<input type="checkbox"/>	<input type="checkbox"/>
A radio or television station	<input type="checkbox"/>	<input type="checkbox"/>
A newspaper or magazine	<input type="checkbox"/>	<input type="checkbox"/>

IF “Yes” TO ANY THANK & TERMINATE

2. Record gender [DO NOT ASK]

3. Does someone in your household currently receive and pay the electricity bill for your home?

- 1 Yes
- 2 No [THANK & TERMINATE]

SECTION 2 - DATA COLLECTION INSTRUMENT

1. A program run by Ontario's electric distribution utilities, called the "Summer Savings Challenge", provided customers with a credit on their electric bill if they reduced their 2007 summer electricity use by 10% or more compared to their summer 2006 electricity use. Have you heard of this program?
 - 1 Yes, has heard of program [**AWARE = YES**]
 - 2 No, has NOT heard of program (**Skip to Q4**)
 - 88 Refused (**Skip to Q4**)
 - 99 Don't know (**Skip to Q4**)

2. (**Ask if Q1=1**) When did you first become aware of this program?

[OPEN END, DO NOT READ]

- 1 Before 2007
- 2 Before the beginning of this summer, that is between January and May of 2007
- 3 Sometime during the summer, that is after May of 2007
- 4 After summer of 2007 [**ACTIVE = NO**]
- 5 When I received the credit on my electricity bill [**ACTIVE = NO**]
- 88 Refused
- 99 Don't know

3. (Ask if Q1=1) How did you first hear about the Summer Savings Challenge program?

[OPEN END, DO NOT READ]

- 1 Newspaper
- 2 Radio, TV
- 3 Internet
- 4 Electric bill
- 5 Insert in electric bill
- 6 Letter from local utility
- 7 Friend, relative, word of mouth
- 8 Announcement by public official
- 9 School, church, community group
- 77 Other, please specify_____
- 88 Refused
- 99 Don't know

4. (All respondents) Do you recall receiving a credit on your electricity bill for reducing your consumption during the summer of 2007 by 10% or more compared to the previous summer? If you had received a credit, it would have been some time towards the end of last year or in January this year.

[OPEN END, DO NOT READ]

- 1 Yes, recalls receiving credit
- 2 No
- 88 Refused
- 99 Don't know

5. (All respondents) Did you actively take steps to reduce your electricity use last summer in order to receive the Summer Savings bill credit?

[OPEN END, DO NOT READ]

- 1 Yes (Go to Q6) [10%INTENTION = YES]
- 2 No (Skip to Q11)
- 88 Refused (Skip to Q11)
- 99 Don't know (Skip to Q11)

6a. (Ask if Q5=1) Which of the following actions, purchases and / or changes did you make last summer in effort to receive the 10% Summer Savings credit? Did you...

[ROTATE]

	<u>Yes</u>	<u>No</u>
Install a new attic fan	<input type="checkbox"/>	<input type="checkbox"/>
Install a new air conditioner	<input type="checkbox"/>	<input type="checkbox"/>
Install a new dishwasher	<input type="checkbox"/>	<input type="checkbox"/>
Install a new electric water heater	<input type="checkbox"/>	<input type="checkbox"/>
Install a new freezer	<input type="checkbox"/>	<input type="checkbox"/>
Install a new refrigerator	<input type="checkbox"/>	<input type="checkbox"/>
Install a new washing machine	<input type="checkbox"/>	<input type="checkbox"/>
Reduce power used for air conditioning	<input type="checkbox"/>	<input type="checkbox"/>
Improve efficiency of your building's shell	<input type="checkbox"/>	<input type="checkbox"/>
Reduce water heater or dryer usage	<input type="checkbox"/>	<input type="checkbox"/>
Reduce usage of lights or electronics	<input type="checkbox"/>	<input type="checkbox"/>
Disconnect or get rid of any appliances or electronics	<input type="checkbox"/>	<input type="checkbox"/>

6b. [IF air conditioner at 6a] And is the air conditioner that you installed:

- 1 A replacement for an old air conditioner
- 2 To be used in combination with your old air conditioner
- 3 The first air conditioner installed in your home

6c. [IF air conditioner at 6a] Could you tell me what type of air conditioner you installed?

[OPEN END, DO NOT READ]

- 1 *Central* air conditioner (Non-EnergyStar) (ASK "Do you know if the central air conditioner was an EnergyStar-rated model?" If so, code it as 2, if don't know, code it as 3)
- 2 *Central* air conditioner (EnergyStar)
- 3 *Central* air conditioner (Don't know whether EnergyStar or not)
- 4 *Room or window* air conditioner (Non-EnergyStar) (ask "Do you know if the replacement room or window air conditioner was an EnergyStar-rated model and, if so, code it as 5, if don't know, code it as 6)
- 5 *Room or window* air conditioner (EnergyStar)
- 6 *Room or window* air conditioner (Don't know whether EnergyStar or not)

- 6d. **[If dishwasher at 6a]** And is the dishwasher that you installed:
- 1 A replacement for an old dishwasher
 - 2 To be used in combination with your old dishwasher
 - 3 The first dishwasher installed in your home
- 6e. **[If dishwasher at 6a]** And is it an energy star rated dishwasher?
- 1 Yes
 - 2 No
 - 99 Don't know
- 6f. **[If water heater at 6a]** Did the water heater replace an old electric water heater?
- 1 Yes, replaced old electric water heater
 - 2 No, replaced an old non-electric water heater
 - 99 Don't know
- 6g. **[IF freezer at 6a]** And is the freezer that you installed:
- 1 A replacement for an old freezer
 - 2 To be used in combination with your old freezer
 - 3 The first freezer installed in your home
- 6h. **[IF freezer at 6a]** And is it an energy star rated freezer?
- 1 Yes
 - 2 No
 - 99 Don't know
- 6g. **[IF refrigerator at 6a]** And is the refrigerator that you installed:
- 1 A replacement for an old refrigerator
 - 2 To be used in combination with your old refrigerator

- 6h. **[IF refrigerator at 6a]** And is it an energy star rated refrigerator?
- 1 Yes
 - 2 No
 - 99 Don't know
- 6i. **[IF washing machine at 6a]** And is the washing machine that you installed:
- 1 A replacement for an old washing machine
 - 2 To be used in combination with your old washing machine
- 6j. **[IF washing machine at 6a]** And is it an energy star rated washing machine?
- 1 Yes
 - 2 No
 - 99 Don't know
- 6k. **[IF reduced air conditioning at 6a]** More specifically, how did you reduce the power used for air conditioning?
[OPEN END, DO NOT READ]
- 1 Got an air-conditioner tune-up
 - 2 Changed furnace filter, or changed more frequently
 - 3 Closed off one or more rooms and didn't cool them
 - 4 Used fewer room air conditioners
 - 5 Used fans instead of air conditioning
 - 6 Installed a programmable thermostat
 - 7 Used an existing programmable thermostat to automatically shift temperature at certain times of the day
 - 8 Turned up thermostat setting in summer so house was not as cool / house was warmer
 - 9 Used air conditioning less frequently
 - 10 Installed ceiling fan
 - 11 Did not use any air conditioning

12 Other, specify: _____

6l. **[IF improved efficiency of shell at 6a]** More specifically, how did you improve the efficiency of your building's shell?

[OPEN END, DO NOT READ]

1 Added ceiling / attic / wall insulation

2 Closed drapes during the day to block the sun

3 Replaced windows

4 Got an energy evaluation / audit of home

5 Weatherproofed home / sealed around windows / doors

6 Other, specify: _____

6m. **[IF reduced water heater or dryer use at 6a]** More specifically, how did you reduce your water heater or dryer use?

1 Insulated hot water pipes

2 Insulated water heater

3 Washed laundry with cold water

4 Dried clothes outside or inside on a rack

5 Ran the dishwasher only when it was full

6 Other, specify: _____

6n. **[IF reduced usage of lights or electronics at 6a]** Could you be more specific about how you reduced usage of lights or electronics?

1 Turned off / reduced use of lights

2 Turned off / reduced use of power to electronics (TV / DVD / VCR / computers)

3 Installed compact fluorescent lights

4 Installed dimmer switch / motion sensor lights

5 Other, specify: _____

60. **[IF disconnected or got rid of appliances at 6a]** Specifically, which appliances or electronics did you disconnect or get rid of?

- 1 Second refrigerator(s) / freezer(s)
- 2 Unplugged devices usually plugged into outlet (cell phones, digital cameras, etc.)
- 3 Other electricity-using equipment (Specify): _____

6p. **[ASK ALL]** And are there any other actions, purchases and / or changes that you made last summer in effort to receive the 10% Summer Savings Credit?

- 1 Installed a Solar photovoltaic system
- 2 Installed a Solar water heater
- 3 Switched appliance from electric to other fuel - Water heater
- 4 Switched appliance from electric to other fuel - Stove / range
- 5 Switched appliance from electric to other fuel – Other, specify: _____
- 6 Installed new furnace (*ask "Do you know if the furnace had an electronically commutated motor or ECM and, if so, code it as 7)*
- 7 Installed new furnace with electronically-commutated motor (ECM)
- 8 Remodeled/did major repair in home to lower electric bill
- 9 Other, specify: _____
- 10 Other, specify: _____
- 11 Other, specify: _____

[IF ANY ACTION MENTIONED, ACTION = YES. IF AWARE=YES AND 10%INTENTION=YES AND ACTION=YES, THEN ACTIVE=YES]

IMPORTANT NOTE: Based on question 6, the following variables should be created. Each respondent should then get a 1 or 0 for each variable depending on whether or not the respondent did that particular action (based on their responses in Q6). Each set of responses to Q7, 7a, 8, 9, 10 should then be linked to these variables created from Q6. Priority should be given to the OPA Actions – outlined below:

<i>Measure Name</i>	<u>Variable #</u>	OPA Program Action?
<u><i>Purchased efficient equipment:</i></u>		
Attic fan	1	
<i>Central air conditioner to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement central air conditioner was an EnergyStar-rated model and, if so, code it as 3, if don't know, code it as 4)</i>	2	
<i>Central air conditioner (EnergyStar) to replace an old one</i>	3	= HCS Action
<i>Central air conditioner to replace an old one (Don't know whether EnergyStar or not)</i>	4	
<i>Central air conditioner – added one. (ask "Did this replace an existing central air conditioner." If replacement – ask about whether EnergyStar and code 2, 3 or 4 as appropriate. If not replacement, code as 5.</i>	5	
<i>Dishwasher to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement dishwasher was an EnergyStar-rated model and, if so, code it as 7, if don't know, code it as 8)</i>	6	
<i>Dishwasher (EnergyStar) to replace an old one</i>	7	
<i>Dishwasher to replace an old one (Don't know whether EnergyStar or not)</i>	8	
<i>Dishwasher – added one. (ask "Did this replace an existing Dishwasher." If replacement – ask about whether EnergyStar and code 6, 7 or 8 as appropriate. If not replacement, code as 9</i>	9	
<i>Electric water heater to replace an old electric water heater (Non-EnergyStar) (ask "Did your previous water heater use a fuel source other than electricity and, if so, code it as 11, if don't know, code it as 12)</i>	10	
<i>Electric water heater to replace an old non-electric water heater</i>	11	
<i>Electric water heater to replace an old one (Don't know whether old one was electric or not).</i>	12	
<i>Freezer to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement freezer was an EnergyStar-rated model and, if so, code it as 14, if don't know, code it as 15)</i>	13	
<i>Freezer (EnergyStar) to replace an old one</i>	14	
<i>Freezer to replace an old one (Don't know whether EnergyStar or not)</i>	15	
<i>Freezer – added one. (ask "Did this replace an existing freezer." If replacement – ask about whether EnergyStar and code 13, 14 or 15 as appropriate. If not replacement, code as 16</i>	16	
<i>Refrigerator to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement refrigerator was an EnergyStar-rated model and, if so, code it as 18, if don't know, code it as 19)</i>	17	
<i>Refrigerator (EnergyStar) to replace an old one</i>	18	
<i>Refrigerator to replace an old one (Don't know whether EnergyStar or not)</i>	19	
<i>Refrigerator – added one. (ask "Did this replace an existing refrigerator." If replacement – ask about whether EnergyStar and code 17, 18 or 19 as appropriate. If not replacement, code as 20</i>	20	
<i>Room or window air conditioner to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement room or window air conditioner was an EnergyStar-rated model and, if so, code it as 22, if don't know, code it as 23)</i>	21	
<i>Room or window air conditioner (EnergyStar) to replace an old one</i>	22	

<i>Measure Name</i>	<u>Variable #</u>	OPA Program Action?
Room or window air conditioner to replace an old one (Don't know whether EnergyStar or not)	23	
Room or window air conditioner– added one. (ask " <i>Did this replace an existing room or window air conditioner.</i> " If replacement – ask about whether EnergyStar and code 21, 22 or 23 as appropriate. If not replacement, code as 24	24	
Solar photovoltaic system	25	
Solar water heater	26	
Washing machine to replace an old one (Non-EnergyStar) (<i>ask "Do you know if the replacement washing machine was an EnergyStar-rated model and, if so, code it as 27, if don't know, code it as 28)</i>	27	
Washing machine (EnergyStar) to replace an old one	28	
Washing machine to replace an old one (Don't know whether EnergyStar or not)	29	
Washing machine – added one. (ask " <i>Did this replace an existing washing machine.</i> " If replacement – ask about whether EnergyStar and code 27, 28 or 29 as appropriate. If not replacement, code as 30	30	
Windows – replaced windows	31	
Other purchase (Specify): _____	32	
<u>Reduced power used for air conditioning:</u>		
Got an air-conditioner tune-up	33	= HCS Action
Changed furnace filter, or changed more frequently	34	= EKC Action
Closed off one or more rooms and didn't cool them	35	
Used fewer room air conditioners	36	
Used fans instead of air conditioning	37	
Installed a programmable thermostat	38	= HCS Action
Used an existing programmable thermostat to automatically shift temperature at certain times of the day	39	
Turned up thermostat setting in summer so house was not as cool / house was warmer	40	
Used air conditioning less frequently	41	
Installed ceiling fan	42	= EKC Action
Did not use any air conditioning	43	
<u>Improved efficiency of the building shell:</u>		
Added ceiling / attic / wall insulation	44	
Closed drapes during the day to block the sun	45	
Replaced windows	46	
Got an energy evaluation / audit of home	47	
Weatherproofed home / sealed around windows / doors	48	
<u>Reduced water heater and dryer use:</u>		
Insulated hot water pipes	49	
Insulated water heater	50	
Washed laundry with cold water	51	

Measure Name

Variable # OPA Program Action?

Dried clothes outside or inside on a rack
Ran the dishwasher only when it was full

52
53

Turned off / reduced use of:

Lights
Power to electronics (TV / DVD / VCR / computers)
Installed compact fluorescent lights
Installed dimmer switch / motion sensor lights
Other (Specify): _____

54
55
56
57
58

= EKC Action
= EKC Action

Disconnected/got rid of:

Second refrigerator(s) / freezer(s)
Unplugged devices usually plugged into outlet (cell phones, digital cameras, etc.)
Other electricity-using equipment (Specify): _____

59
60
61

= GRRP Action

7. (Ask if at least one item mentioned in Q6) Was [name of action mentioned in Q6] to receive the Summer Savings credit also part of another conservation program / initiative which you were participating in or were you participating in the Summer Savings program only ? (Repeat 7 and 7a for each action mentioned – how about for (name of action), etc.)
- 1 Summer Savings program only (Repeat Q7 if any more actions from Q6, otherwise skip to Q9)
 - 2 Other program only (Go to Q7a. Repeat Q7 if any more actions from Q6, otherwise skip to Q8)
 - 3 Both Summer Savings and another program (Go to Q7a. Repeat Q7 if any more actions from Q6, otherwise skip to Q8)
 - 4 None (Repeat Q7 if any more actions from Q6, otherwise skip to Q9)
 - 88 Refused (Repeat Q7 if any more actions from Q6, otherwise skip to Q9)
 - 99 Don't know (Repeat Q7 if any more actions from Q6, otherwise skip to Q9)
- 7a. Do you recall the name of the other conservation program that you participated in for [each action in Q6 for which Q7 = 2 or 3]?
- 1. Record Program Name _____
 - 2 No
 - 88 Refused
 - 99 Don't know
- 7b. If [ACTION in Q6 = EKC action OR GRRP action OR HCS action as flagged in Q6 action table] and respondent did not mention any of the following:
- Every Kilowatt Counts (EKC),
Great Refrigerator Round-up (GRRP)
Hot and Cool Savings (HCS)
- ...ask : More specifically, was [INSERT ACTION] part of the [INSERT PROGRAM NAME FROM Q6 ACTION TABLE] program? Describe program as given below:
- EKC = The Every Kilowatt Counts program offered coupons for compact fluorescent lights, EnergyStar ceiling fans, outdoor motion sensor lights, outdoor solar lights, and other energy efficient products
- GRRP = The Great Refrigerator Round-up Program provided free pick-up and recycling for secondary refrigerators and freezers
- HCS = The Hot Savings Program and Cool Savings Program offered rebates for air-conditioner tune-ups, programmable thermostats, EnergyStar central air conditioners and furnaces and air handlers with special electronically commutated motors

8. **(Ask for each item about which Q7=1)** If the program did not exist for [name of action from Q6], how likely would you have been to take that action anyway, with only the 10% bill credit program in place? Would you have been . . . **(Repeat for each action mentioned – how about for (name of action), etc.)**

- 1 Extremely likely
- 2 Very likely
- 3 Somewhat likely
- 4 Not very likely, or
- 5 Not at all likely
- 88 Refused
- 99 Don't know

9. **(Ask if respondent mentioned at least one item in Q6, i.e., took an action)** How likely do you think you would have been to [name of action taken in Q6] if there had been no Summer Savings 10% bill credit program **(for each item for which Q7=1, add: "but the other program had existed")**? Would you have been . . . **(Repeat for each action mentioned – how about for (name of action), etc.)**

- 1 Extremely likely
- 2 Very likely
- 3 Somewhat likely
- 4 Not very likely, or
- 5 Not at all likely?
- 88 Refused
- 99 Don't know

[IF "SUMMER SAVINGS ONLY" OR "BOTH" AT Q7 ASK:]

10. **(Ask if at least one item mentioned in Q6)** How important was the 10% Summer Savings bill credit when you decided to [name of action taken in Q6]? Would you say it was... **(Repeat for each action mentioned – how about for (name of action), etc.)**

- 1 The most important reason you took the action
- 2 One of the important reasons you took the action
- 3 A reason but not an important one, or
- 4 Not a reason. You would have taken the action even without the potential discount
- 88 Refused **(Don't read)**
- 99 Don't know **(Don't read)**

11. **[IF AT LEAST ONE ITEM MENTIONED IN Q6]** Did you take any other actions last summer that might have reduced your electricity use?

[IF AT NO ITEMS MENTIONED IN Q6] Did you take any action last summer that might have reduced your electricity use?

1 Yes

2 No

88 Refused (**Don't read**)

99 Don't know (**Don't read**)

11a. **(Ask if YES AT Q11)** Which of the following actions, purchases and / or changes did you make last summer that might have reduced your electricity use? Did you...

[ROTATE]

	<u>Yes</u>	<u>No</u>
Install a new attic fan	<input type="checkbox"/>	<input type="checkbox"/>
Install a new air conditioner	<input type="checkbox"/>	<input type="checkbox"/>
Install a new dishwasher	<input type="checkbox"/>	<input type="checkbox"/>
Install a new electric water heater	<input type="checkbox"/>	<input type="checkbox"/>
Install a new freezer	<input type="checkbox"/>	<input type="checkbox"/>
Install a new refrigerator	<input type="checkbox"/>	<input type="checkbox"/>
Install a new washing machine	<input type="checkbox"/>	<input type="checkbox"/>
Reduce power used for air conditioning	<input type="checkbox"/>	<input type="checkbox"/>
Improve efficiency of your building's shell	<input type="checkbox"/>	<input type="checkbox"/>
Reduce water heater or dryer usage	<input type="checkbox"/>	<input type="checkbox"/>
Reduce usage of lights or electronics	<input type="checkbox"/>	<input type="checkbox"/>
Disconnect or get rid of any appliances or electronics	<input type="checkbox"/>	<input type="checkbox"/>

11b. **[IF air conditioner at 11a]** And is the air conditioner that you installed:

1 A replacement for an old air conditioner

2 To be used in combination with your old air conditioner

3 The first air conditioner installed in your home

11c. [IF air conditioner at 11a] Could you tell me what type of air conditioner you installed?

[OPEN END, DO NOT READ]

- 1 Central air conditioner (Non-EnergyStar) (*ASK "Do you know if the central air conditioner was an EnergyStar-rated model?" If so, code it as 2, if don't know, code it as 3*)
- 2 Central air conditioner (EnergyStar)
- 3 Central air conditioner (Don't know whether EnergyStar or not)
- 4 Room or window air conditioner (Non-EnergyStar) (*ask "Do you know if the replacement room or window air conditioner was an EnergyStar-rated model and, if so, code it as 5, if don't know, code it as 6*)
- 5 Room or window air conditioner (EnergyStar)
- 6 Room or window air conditioner (Don't know whether EnergyStar or not)

11d. [If dishwasher at 11a] And is the dishwasher that you installed:

- 1 A replacement for an old dishwasher
- 2 To be used in combination with your old dishwasher
- 3 The first dishwasher installed in your home

11e. [If dishwasher at 11a] And is it an energy star rated dishwasher?

- 1 Yes
- 2 No
- 99 Don't know

11f. [If water heater at 11a] Did the water heater replace an old electric water heater?

- 1 Yes, replaced old electric water heater
- 2 No, replaced an old non-electric water heater
- 99 Don't know

11g. **[IF freezer at 11a]** And is the freezer that you installed:

- 1 A replacement for an old freezer
- 2 To be used in combination with your old freezer
- 3 The first freezer installed in your home

11h. **[IF freezer at 11a]** And is it an energy star rated freezer?

- 1 Yes
- 2 No
- 99 Don't know

11g. **[IF refrigerator at 11a]** And is the refrigerator that you installed:

- 1 A replacement for an old refrigerator
- 2 To be used in combination with your old refrigerator

11h. **[IF refrigerator at 11a]** And is it an energy star rated refrigerator?

- 1 Yes
- 2 No
- 99 Don't know

11i. **[IF washing machine at 11a]** And is the washing machine that you installed:

- 1 A replacement for an old washing machine
- 2 To be used in combination with your old washing machine

11j. **[IF washing machine at 11a]** And is it an energy star rated washing machine?

- 1 Yes
- 2 No
- 99 Don't know

11k. **[IF reduced air conditioning at 11a]** More specifically, how did you reduce the power used for air conditioning?

[OPEN END, DO NOT READ]

- 1 Got an air-conditioner tune-up
- 2 Changed furnace filter, or changed more frequently
- 3 Closed off one or more rooms and didn't cool them
- 4 Used fewer room air conditioners
- 5 Used fans instead of air conditioning
- 6 Installed a programmable thermostat
- 7 Used an existing programmable thermostat to automatically shift temperature at certain times of the day
- 8 Turned up thermostat setting in summer so house was not as cool / house was warmer
- 9 Used air conditioning less frequently
- 10 Installed ceiling fan
- 11 Did not use any air conditioning
- 12 Other, specify: _____

11l. **[IF improved efficiency of shell at 11a]** More specifically, how did you improve the efficiency of your building's shell?

[OPEN END, DO NOT READ]

- 1 Added ceiling / attic / wall insulation
- 2 Closed drapes during the day to block the sun
- 3 Replaced windows
- 4 Got an energy evaluation / audit of home
- 5 Weatherproofed home / sealed around windows / doors
- 6 Other, specify: _____

11m. **[IF reduced water heater or dryer use at 11a]** More specifically, how did you reduce your water heater or dryer use?

- 1 Insulated hot water pipes
- 2 Insulated water heater
- 3 Washed laundry with cold water
- 4 Dried clothes outside or inside on a rack
- 5 Ran the dishwasher only when it was full
- 6 Other, specify: _____

11n. **[IF reduced usage of lights or electronics at 11a]** Could you be more specific about how you reduced usage of lights or electronics?

- 1 Turned off / reduced use of lights
- 2 Turned off / reduced use of power to electronics (TV / DVD / VCR / computers)
- 3 Installed compact fluorescent lights
- 4 Installed dimmer switch / motion sensor lights
- 5 Other, specify: _____

11o. **[IF disconnected or got rid of appliances at 11a]** Specifically, which appliances or electronics did you disconnect or get rid of?

- 1 Second refrigerator(s) / freezer(s)
- 2 Unplugged devices usually plugged into outlet (cell phones, digital cameras, etc.)
- 3 Other electricity-using equipment (Specify): _____

11p. (Ask if YES AT Q11) And are there any other actions, purchases and / or changes that you made last that might have reduced your electricity use?

- 1 Installed a Solar photovoltaic system
- 2 Installed a Solar water heater
- 3 Switched appliance from electric to other fuel - Water heater
- 4 Switched appliance from electric to other fuel - Stove / range
- 5 Switched appliance from electric to other fuel – Other, specify: _____
- 6 Installed new furnace (*ask "Do you know if the furnace had an electronically commutated motor or ECM and, if so, code it as 7)*
- 7 Installed new furnace with electronically-commutated motor (ECM)
- 8 Remodeled/did major repair in home to lower electric bill
- 9 Other, specify: _____
- 10 Other, specify: _____
- 11 Other, specify: _____

[IF ANY ACTION MENTIONED, ACTION = YES. IF AWARE=YES AND 10%INTENTION=YES AND ACTION=YES, THEN ACTIVE=YES]

IMPORTANT NOTE: Based on question 11, the following variables should be created. Each respondent should then get a 1 or 0 for each variable depending on whether or not the respondent did that particular action (based on their responses in Q11). Each set of responses to Q12, 12a, should then be linked to these variables created from Q11. Priority should be given to the OPA Actions – outlined below:
Variable numbering needs to be consistent with Q6.

Measure Name

OPA Program
Action?

Purchased efficient equipment:

Attic fan

Central air conditioner to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement central air conditioner was an EnergyStar-rated model and, if so, code it as 3, if don't know, code it as 4)

Central air conditioner (EnergyStar) to replace an old one

= HCS Action

Central air conditioner to replace an old one (Don't know whether EnergyStar or not)

Central air conditioner – added one. (ask "Did this replace an existing central air conditioner." If replacement – ask about whether EnergyStar and code 2, 3 or 4 as appropriate. If not replacement, code as 5.

Dishwasher to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement dishwasher was an EnergyStar-rated model and, if so, code it as 7, if don't know, code it as 8)

Dishwasher (EnergyStar) to replace an old one

Dishwasher to replace an old one (Don't know whether EnergyStar or not)

Dishwasher – added one. (ask "Did this replace an existing Dishwasher." If replacement – ask about whether EnergyStar and code 6, 7 or 8 as appropriate. If not replacement, code as 9

Electric water heater to replace an old electric water heater (Non-EnergyStar) (ask "Did your previous water heater use a fuel source other than electricity and, if so, code it as 11, if don't know, code it as 12)

Electric water heater to replace an old non-electric water heater

Electric water heater to replace an old one (Don't know whether old one was electric or not).

Freezer to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement freezer was an EnergyStar-rated model and, if so, code it as 14, if don't know, code it as 15)

Freezer (EnergyStar) to replace an old one

Freezer to replace an old one (Don't know whether EnergyStar or not)

Freezer – added one. (ask "Did this replace an existing freezer." If replacement – ask about whether EnergyStar and code 13, 14 or 15 as appropriate. If not replacement, code as 16

Refrigerator to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement refrigerator was an EnergyStar-rated model and, if so, code it as 18, if don't know, code it as 19)

Refrigerator (EnergyStar) to replace an old one

Refrigerator to replace an old one (Don't know whether EnergyStar or not)

Refrigerator – added one. (ask "Did this replace an existing refrigerator." If replacement – ask about whether EnergyStar and code 17, 18 or 19 as appropriate. If not replacement, code as 20

Room or window air conditioner to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement room or window air conditioner was an EnergyStar-rated model and, if so, code it as 22, if don't know, code it as 23)

Measure Name

Room or window air conditioner (EnergyStar) to replace an old one
 Room or window air conditioner to replace an old one (Don't know whether EnergyStar or not)
 Room or window air conditioner– added one. (ask "*Did this replace an existing room or window air conditioner.*" If replacement – ask about whether EnergyStar and code 21, 22 or 23 as appropriate. If not replacement, code as 24

Solar photovoltaic system
 Solar water heater

Washing machine to replace an old one (Non-EnergyStar) (*ask "Do you know if the replacement washing machine was an EnergyStar-rated model and, if so, code it as 22, if don't know, code it as 23)*

Washing machine (EnergyStar) to replace an old one

Washing machine to replace an old one (Don't know whether EnergyStar or not)

Washing machine – added one. (ask "*Did this replace an existing washing machine.*" If replacement – ask about whether EnergyStar and code 27, 28 or 29 as appropriate. If not replacement, code as 30

Windows – replaced windows

Other purchase (Specify): _____

Reduced power used for air conditioning:

Got an air-conditioner tune-up	= HCS Action
Changed furnace filter, or changed more frequently	= EKC Action
Closed off one or more rooms and didn't cool them	
Used fewer room air conditioners	
Used fans instead of air conditioning	
Installed a programmable thermostat	= HCS Action
Used an existing programmable thermostat to automatically shift temperature at certain times of the day	
Turned up thermostat setting in summer so house was not as cool / house was warmer	
Used air conditioning less frequently	
Installed ceiling fan	= EKC Action
Did not use any air conditioning	

Improved efficiency of the building shell:

Added ceiling / attic / wall insulation
 Closed drapes during the day to block the sun
 Replaced windows
 Got an energy evaluation / audit of home
 Weatherproofed home / sealed around windows / doors

Reduced water heater and dryer use:

Insulated hot water pipes
 Insulated water heater

Measure Name

Washed laundry with cold water
Dried clothes outside or inside on a rack
Ran the dishwasher only when it was full

OPA Program
Action?

Turned off / reduced use of:

Lights
Power to electronics (TV / DVD / VCR / computers)
Installed compact fluorescent lights
Installed dimmer switch / motion sensor lights
Other (Specify): _____

= EKC Action
= EKC Action

Disconnected/got rid of:

Second refrigerator(s) / freezer(s)
Unplugged devices usually plugged into outlet (cell phones, digital cameras, etc.)
Other electricity-using equipment (Specify): _____

= GRRP
Action

12. (Ask if at least one item mentioned in Q11) Did you [name of action mentioned in Q11] for participating in the Summer Savings program only or by participating in other conservation programs / initiatives? (Repeat 12 and 12a for each action mentioned – how about for (name of action), etc.)
- 1 Summer Savings program only (Repeat Q12 if any more actions from Q11, otherwise skip to Q13)
 - 2 Other program / initiative only (Go to Q12a. Repeat Q12 if any more actions from Q11, otherwise skip to Q13)
 - 3 Both (Go to 12a. Repeat Q12 if any more actions from Q11, otherwise skip to Q13)
 - 4 None (Repeat Q12 if any more actions from Q11, otherwise skip to Q13)
 - 88 Refused (Repeat Q12 if any more actions from Q11, otherwise skip to Q13)
 - 99 Don't know (Repeat Q12 if any more actions from Q11, otherwise skip to Q13)

12a. Do you recall the name of the conservation program that you participated in for [each action in Q11 for which Q12 = 2 or 3]?

1. Record Program Name _____

2 No (Skip to

88 Refused

99 Don't know

If [ACTION in Q11 = EKC action OR GRRP action OR HCS action as flagged in Q11 action table] and respondent did not mention any of the following:

Every Kilowatt Counts (EKC),
Great Refrigerator Round-up (GRRP)
Hot and Cool Savings (HCS)

...ask : More specifically, was [INSERT ACTION] part of the [INSERT PROGRAM NAME FROM Q11 ACTION TABLE] program? Describe program as given below)

EKC = The Every Kilowatt Counts program offered coupons for compact fluorescent lights, EnergyStar ceiling fans, outdoor motion sensor lights, outdoor solar lights, and other energy efficient products

GRRP = The Great Refrigerator Round-up Program provided free pick-up and recycling for secondary refrigerators and freezers

HCS = The Hot Savings Program and Cool Savings Program offered rebates for air-conditioner tune-ups, programmable thermostats, EnergyStar central air conditioners and furnaces and air handlers with special electronically commutated motors

13. (If respondent mentioned any efficient appliances purchases in Q6 or Q11, add: "Other than the appliance purchases you've already mentioned") Did you purchase any new appliances or equipment between the summer of 2006 and the summer of 2007?

1 Yes (Go to Q14)

2 No (Skip to Q15)

88 Refused (Skip to Q15)

99 Don't know (Skip to Q15)

14. (Ask if Q13=1) What new appliances or equipment did you buy between these summer periods?

Attic fan	1
Central air conditioner to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement central air conditioner was an EnergyStar-rated model and, if so, code it as 3, if don't know, code it as 4)	2
Central air conditioner (EnergyStar) to replace an old one	3
Central air conditioner to replace an old one (Don't know whether EnergyStar or not)	4
Central air conditioner – added one. (ask "Did this replace an existing central air conditioner." If replacement – ask about whether EnergyStar and code 2, 3 or 4 as appropriate. If not replacement, code as 5.	5
Dishwasher to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement dishwasher was an EnergyStar-rated model and, if so, code it as 7, if don't know, code it as 8)	6
Dishwasher (EnergyStar) to replace an old one	7
Dishwasher to replace an old one (Don't know whether EnergyStar or not)	8
Dishwasher – added one. (ask "Did this replace an existing Dishwasher." If replacement – ask about whether EnergyStar and code 6, 7 or 8 as appropriate. If not replacement, code as 9	9
Electric water heater to replace an old electric water heater (Non-EnergyStar) (ask "Did your previous water heater use a fuel source other than electricity and, if so, code it as 11, if don't know, code it as 12)	10
Electric water heater to replace an old non-electric water heater	11
Electric water heater to replace an old one (Don't know whether old one was electric or not).	12
Freezer to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement freezer was an EnergyStar-rated model and, if so, code it as 14, if don't know, code it as 15)	13
Freezer (EnergyStar) to replace an old one	14
Freezer to replace an old one (Don't know whether EnergyStar or not)	15
Freezer – added one. (ask "Did this replace an existing freezer." If replacement – ask about whether EnergyStar and code 13, 14 or 15 as appropriate. If not replacement, code as 16	16
Refrigerator to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement refrigerator was an EnergyStar-rated model and, if so, code it as 18, if don't know, code it as 19)	17
Refrigerator (EnergyStar) to replace an old one	18
Refrigerator to replace an old one (Don't know whether EnergyStar or not)	19

Refrigerator – added one. (ask “ <i>Did this replace an existing refrigerator.</i> ” If replacement – ask about whether EnergyStar and code 17, 18 or 19 as appropriate. If not replacement, code as 20	20
Room or window air conditioner to replace an old one (Non-EnergyStar) (ask “ <i>Do you know if the replacement room or window air conditioner was an EnergyStar-rated model and, if so, code it as 22, if don’t know, code it as 23)</i>	21
Room or window air conditioner (EnergyStar) to replace an old one	22
Room or window air conditioner to replace an old one (Don’t know whether EnergyStar or not)	23
Room or window air conditioner– added one. (ask “ <i>Did this replace an existing room or window air conditioner.</i> ” If replacement – ask about whether EnergyStar and code 21, 22 or 23 as appropriate. If not replacement, code as 24	24
Solar photovoltaic system	25
Solar water heater	26
Washing machine to replace an old one (Non-EnergyStar) (ask “ <i>Do you know if the replacement washing machine was an EnergyStar-rated model and, if so, code it as 28, if don’t know, code it as 29)</i>	27
Washing machine (EnergyStar) to replace an old one	28
Washing machine to replace an old one (Don’t know whether EnergyStar or not)	29
Washing machine – added one. (ask “ <i>Did this replace an existing washing machine.</i> ” If replacement – ask about whether EnergyStar and code 27, 28 or 29 as appropriate. If not replacement, code as 30	30
Windows	31
Other purchase (Specify): _____	32

15. Did you switch any of your appliances / equipment from electricity to natural gas or another fuel between the summer of 2006 and the summer of 2007?
- 1 Yes (Go to Q16)
 - 2 No (Skip to Q17)
 - 88 Refused (Skip to Q17)
 - 99 Don’t know (Skip to Q17)
16. (Ask if Q15 =1) Which specific appliances or equipment did you switch from electricity to natural gas or another fuel? (check all that apply)
- [OPEN END, DO NOT READ]
- 1 Water heater
 - 2 Pool / spa heater
 - 3 Stove / Range
 - 4 Dryer
 - 5 Heating system

- 6 Other (Specify): _____
- 88 Refused
- 99 Don't know
17. What, if any, type of air conditioning do you have in your home Do you have . . .
- 1 Central air conditioning, **(Skip to Q17b)**
- 2 Multiple room air conditioners, **(Go to Q17a)**
- 3 A single room air conditioner, or **(Skip to Q17b)**
- 4 No air conditioning **(Skip to Q19)**
- 88 Refused **(Skip to Q19)**
- 99 Don't know **(Skip to Q19)**
- 17a. How many **[INSERT SINGLE / MULTIPLE ROOM FROM Q17]** air conditioners do you have? And regularly use in the summer?
- _____ room air conditioners
- _____ regularly use
- 17b. **(Ask if Q17 = 1, 2 or 3)** On hot days, when do you typically use your air conditioning? Is it . . . **[READ LIST, RECORD ONE RESPONSE]**
- 1 All day and night,
- 2 All day and evening,
- 3 Overnight only,
- 4 Early or mid-afternoon only,
- 5 Just for the hottest hour or two of the afternoon,
- 6 Late afternoon only/at the end of the workday, or
- 7 Some other schedule (Specify): _____
- 88 Refused **(Don't read)**
- 99 Don't know **(Don't read)**
- 17c. **(Ask if Q17 = 1, 2 or 3)** Thinking about your weekend air conditioning use, do you typically use your air conditioning ...?
- 1 More on weekends

- 2 Less on weekends
- 3 The same as you do on weekdays
- 88 Refused
- 99 Don't know

17d. (Ask if Q17 = 1, 2 or 3) Thinking back to the summers of 2006 and 2007, did you use your air conditioning...?

- 1 More in 2006
- 2 More in 2007
- 3 About the same in both summers
- 88 Refused
- 99 Don't know

18. In the summer of 2006, an energy conservation program was introduced offering a bill credit to customers who reduced their electricity use by 10% or more. Did you attempt to participate in this program?

- 1 Yes (Go to Q18a)
- 2 No (Skip to Q19)
- 88 Refused (Skip to Q19)
- 99 Don't know (Skip to Q19)

18a. And did you receive a bill credit for reducing your electricity use by 10% or more in the summer of 2006 (the summer before last)?

- 1 Yes
- 2 No
- 88 Refused
- 99 Don't know

19. Aside from anything you may have already mentioned, are there any other factors that might have contributed your household to use LESS electricity during the summer of 2007?

- 1 Yes
- 2 No
- 88 Refused
- 99 Don't know

19a. (Ask if Q19=1) Which of the following actions, purchases and / or changes did you that might have contributed your household to use LESS electricity during the summer of 2007? Did you...

[ROTATE]

	<u>Yes</u>	<u>No</u>
Install a new attic fan	<input type="checkbox"/>	<input type="checkbox"/>
Install a new air conditioner	<input type="checkbox"/>	<input type="checkbox"/>
Install a new dishwasher	<input type="checkbox"/>	<input type="checkbox"/>
Install a new electric water heater	<input type="checkbox"/>	<input type="checkbox"/>
Install a new freezer	<input type="checkbox"/>	<input type="checkbox"/>
Install a new refrigerator	<input type="checkbox"/>	<input type="checkbox"/>
Install a new washing machine	<input type="checkbox"/>	<input type="checkbox"/>
Reduce power used for air conditioning	<input type="checkbox"/>	<input type="checkbox"/>
Improve efficiency of your building's shell	<input type="checkbox"/>	<input type="checkbox"/>
Reduce water heater or dryer usage	<input type="checkbox"/>	<input type="checkbox"/>
Reduce usage of lights or electronics	<input type="checkbox"/>	<input type="checkbox"/>
Disconnect or get rid of any appliances or electronics	<input type="checkbox"/>	<input type="checkbox"/>

19b. [IF air conditioner at 19a] And is the air conditioner that you installed:

- 1 A replacement for an old air conditioner
- 2 To be used in combination with your old air conditioner
- 3 The first air conditioner installed in your home

19c. [IF air conditioner at 19a] Could you tell me what type of air conditioner you installed?

[OPEN END, DO NOT READ]

- 1 *Central* air conditioner (Non-EnergyStar) (ASK "Do you know if the central air conditioner was an EnergyStar-rated model?" If so, code it as 2, if don't know, code it as 3)
- 2 *Central* air conditioner (EnergyStar)
- 3 *Central* air conditioner (Don't know whether EnergyStar or not)

- 4 Room or window air conditioner (Non-EnergyStar) (*ask "Do you know if the replacement room or window air conditioner was an EnergyStar-rated model and, if so, code it as 5, if don't know, code it as 6)*
 - 5 Room or window air conditioner (EnergyStar)
 - 6 Room or window air conditioner (Don't know whether EnergyStar or not)
- 19d. [If dishwasher at 19a] And is the dishwasher that you installed:
- 1 A replacement for an old dishwasher
 - 2 To be used in combination with your old dishwasher
 - 3 The first dishwasher installed in your home
- 19e. [If dishwasher at 19a] And is it an energy star rated dishwasher?
- 1 Yes
 - 2 No
 - 99 Don't know
- 19f. [If water heater at 19a] Did the water heater replace an old electric water heater?
- 1 Yes, replaced old electric water heater
 - 2 No, replaced an old non-electric water heater
 - 99 Don't know
- 19g. [IF freezer at 19a] And is the freezer that you installed:
- 1 A replacement for an old freezer
 - 2 To be used in combination with your old freezer
 - 3 The first freezer installed in your home
- 19h. [IF freezer at 19a] And is it an energy star rated freezer?
- 1 Yes
 - 2 No

99 Don't know

19g. **[IF refrigerator at 19a]** And is the refrigerator that you installed:

1 A replacement for an old refrigerator

2 To be used in combination with your old refrigerator

19h. **[IF refrigerator at 19a]** And is it an energy star rated refrigerator?

1 Yes

2 No

99 Don't know

19i. **[IF washing machine at 19a]** And is the washing machine that you installed:

1 A replacement for an old washing machine

2 To be used in combination with your old washing machine

19j. **[IF washing machine at 19a]** And is it an energy star rated washing machine?

1 Yes

2 No

99 Don't know

19k. **[IF reduced air conditioning at 19a]** More specifically, how did you reduce the power used for air conditioning? **[OPEN END, DO NOT READ]**

- 1 Got an air-conditioner tune-up
- 2 Changed furnace filter, or changed more frequently
- 3 Closed off one or more rooms and didn't cool them
- 4 Used fewer room air conditioners
- 5 Used fans instead of air conditioning
- 6 Installed a programmable thermostat
- 7 Used an existing programmable thermostat to automatically shift temperature at certain times of the day
- 8 Turned up thermostat setting in summer so house was not as cool / house was warmer
- 9 Used air conditioning less frequently
- 10 Installed ceiling fan
- 11 Did not use any air conditioning
- 12 Other, specify: _____

19l. **[IF improved efficiency of shell at 19a]** More specifically, how did you improve the efficiency of your building's shell?

[OPEN END, DO NOT READ]

- 1 Added ceiling / attic / wall insulation
- 2 Closed drapes during the day to block the sun
- 3 Replaced windows
- 4 Got an energy evaluation / audit of home
- 5 Weatherproofed home / sealed around windows / doors
- 6 Other, specify: _____

19m. **[IF reduced water heater or dryer use at 19a]** More specifically, how did you reduce your water heater or dryer use?

- 7 Insulated hot water pipes
- 8 Insulated water heater
- 9 Washed laundry with cold water
- 10 Dried clothes outside or inside on a rack
- 11 Ran the dishwasher only when it was full
- 12 Other, specify: _____

19n. **[IF reduced usage of lights or electronics at 19a]** Could you be more specific about how you reduced usage of lights or electronics?

- 1 Turned off / reduced use of lights
- 2 Turned off / reduced use of power to electronics (TV / DVD / VCR / computers)
- 3 Installed compact fluorescent lights
- 4 Installed dimmer switch / motion sensor lights
- 5 Other, specify: _____

19o. **[IF disconnected or got rid of appliances at 19a]** Specifically, which appliances or electronics did you disconnect or get rid of?

- 1 Second refrigerator(s) / freezer(s)
- 2 Unplugged devices usually plugged into outlet (cell phones, digital cameras, etc.)
- 3 Other electricity-using equipment (Specify): _____

19p. **(Ask if Q19=1)** And are there any other actions, purchases and / or changes that you made that might have contributed your household to use LESS electricity during the summer of 2007?

- 1 Installed a Solar photovoltaic system
- 2 Installed a Solar water heater

- 3 Switched appliance from electric to other fuel - Water heater
- 4 Switched appliance from electric to other fuel - Stove / range
- 5 Switched appliance from electric to other fuel – Other, specify: _____
- 6 Installed new furnace (*ask "Do you know if the furnace had an electronically commutated motor or ECM and, if so, code it as 7)*
- 7 Installed new furnace with electronically-commutated motor (ECM)
- 8 Remodeled/did major repair in home to lower electric bill
- 9 Other, specify: _____
- 10 Other, specify: _____
- 11 Other, specify: _____

[IF ANY ACTION MENTIONED, ACTION = YES. IF AWARE=YES AND 10%INTENTION=YES AND ACTION=YES, THEN ACTIVE=YES]

IMPORTANT NOTE: Based on question 19, the following variables should be created. Each respondent should then get a 1 or 0 for each variable depending on whether or not the respondent did that particular action (based on their responses in Q6).

Numbering needs to be same as Q6.

<i>Measure Name</i>	<u>Variable #</u>
<u><i>Purchased efficient equipment:</i></u>	
Attic fan	1
Central air conditioner to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement central air conditioner was an EnergyStar-rated model and, if so, code it as 3, if don't know, code it as 4)	2
Central air conditioner (EnergyStar) to replace an old one	3
Central air conditioner to replace an old one (Don't know whether EnergyStar or not)	4
Central air conditioner – added one. (ask "Did this replace an existing central air conditioner." If replacement – ask about whether EnergyStar and code 2, 3 or 4 as appropriate. If not replacement, code as 5.	5
Dishwasher to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement dishwasher was an EnergyStar-rated model and, if so, code it as 7, if don't know, code it as 8)	6
Dishwasher (EnergyStar) to replace an old one	7
Dishwasher to replace an old one (Don't know whether EnergyStar or not)	8
Dishwasher – added one. (ask "Did this replace an existing Dishwasher." If replacement – ask about whether EnergyStar and code 6, 7 or 8 as appropriate. If not replacement, code as 9	9
Electric water heater to replace an old electric water heater (Non-EnergyStar) (ask "Did your previous water heater use a fuel source other than electricity and, if so, code it as 11, if don't know, code it as 12)	10
Electric water heater to replace an old non-electric water heater	11
Electric water heater to replace an old one (Don't know whether old one was electric or not).	12
Freezer to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement freezer was an EnergyStar-rated model and, if so, code it as 14, if don't know, code it as 15)	13
Freezer (EnergyStar) to replace an old one	14
Freezer to replace an old one (Don't know whether EnergyStar or not)	15
Freezer – added one. (ask "Did this replace an existing freezer." If replacement – ask about whether EnergyStar and code 13, 14 or 15 as appropriate. If not replacement, code as 16	16
Refrigerator to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement refrigerator was an EnergyStar-rated model and, if so, code it as 18, if don't know, code it as 19)	17
Refrigerator (EnergyStar) to replace an old one	18
Refrigerator to replace an old one (Don't know whether EnergyStar or not)	19
Refrigerator – added one. (ask "Did this replace an existing refrigerator." If replacement – ask about whether EnergyStar and code 17, 18 or 19 as appropriate. If not replacement, code as 20	20
Room or window air conditioner to replace an old one (Non-EnergyStar) (ask "Do you know if the replacement room or window air conditioner was an EnergyStar-rated model and, if so, code it as 22, if don't know, code it as 23)	21
Room or window air conditioner (EnergyStar) to replace an old one	22
Room or window air conditioner to replace an old one (Don't know whether EnergyStar or	23

<i>Measure Name</i>	<u>Variable #</u>
not)	
Room or window air conditioner– added one. (ask “ <i>Did this replace an existing room or window air conditioner.</i> ” If replacement – ask about whether EnergyStar and code 21, 22 or 23 as appropriate. If not replacement, code as 24	24
Solar photovoltaic system	25
Solar water heater	26
Washing machine to replace an old one (Non-EnergyStar) (ask “ <i>Do you know if the replacement washing machine was an EnergyStar-rated model and, if so, code it as 28, if don’t know, code it as 29)</i> ”	27
Washing machine (EnergyStar) to replace an old one	28
Washing machine to replace an old one (Don’t know whether EnergyStar or not)	29
Washing machine – added one. (ask “ <i>Did this replace an existing washing machine.</i> ” If replacement – ask about whether EnergyStar and code 27, 28 or 29 as appropriate. If not replacement, code as 30	30
Windows – replaced windows	31
Other purchase (Specify): _____	32
 <u>Reduced power used for air conditioning:</u>	
Got an air-conditioner tune-up	33
Changed furnace filter, or changed more frequently	34
Closed off one or more rooms and didn’t cool them	35
Used fewer room air conditioners	36
Used fans instead of air conditioning	37
Installed a programmable thermostat	38
Used an existing programmable thermostat to automatically shift temperature at certain times of the day	39
Turned up thermostat setting in summer so house was not as cool / house was warmer	40
Used air conditioning less frequently	41
Installed ceiling fan	42
Did not use any air conditioning	43
 <u>Improved efficiency of the building shell:</u>	
Added ceiling / attic / wall insulation	44
Closed drapes during the day to block the sun	45
Replaced windows	46
Got an energy evaluation / audit of home	47
Weatherproofed home / sealed around windows / doors	48
 <u>Reduced water heater and dryer use:</u>	
Insulated hot water pipes	49
Insulated water heater	50
Washed laundry with cold water	51
Dried clothes outside or inside on a rack	52
Ran the dishwasher only when it was full	53

Measure Name

Variable #

Turned off / reduced use of:

Lights	54
Power to electronics (TV / DVD / VCR / computers)	55
Installed compact fluorescent lights	56
Installed dimmer switch / motion sensor lights	57
Other (Specify): _____	58

Disconnected/got rid of:

Second refrigerator(s) / freezer(s)	59
Unplugged devices usually plugged into outlet (cell phones, digital cameras, etc.)	60
Other electricity-using equipment (Specify): _____	61

20. Are there any factors that might have contributed your household using MORE electricity during the summer of 2007? For example, did you purchase any electrical appliances or equipment that you did not previously have in your home, between the summer of 2006 and the summer of 2007?

- 1 Yes (Go to 21a)
- 2 No (Skip to Q22)
- 88 Refused (Skip to Q22)
- 99 Don't know (Skip to Q22)

21a. What specific appliances or equipment did you purchase?

[Do not read list. Repeat prompt "Anything else?" up to 3 times or until R. says 'no'.]

Purchased additional appliances that use electricity:

Central air conditioning	1
Room air conditioner(s)	2
Computer (Desktop)	3
Computer (Laptop)	4
Television (Specify type below):	5
Vaccum tube(s)	6
LCD(s) (liquid crystal display) flat screen	7
Plasma(s) flat screen	8
VCR(s)	9
DVD recorder/player(s)	10
Video Game Console (XBox, etc.)	11
Dehumidifier	12
Microwave oven	13
Dishwasher	14
Clothes washer	15
Electric clothes dryer	16

Wine cooler	17
Water cooler	18
Other (What did you purchase or install):	19
#1: _____	20
#2: _____	21
#3: _____	22

22. Did you switch any electrical appliance or equipment from natural gas (or another fuel) to electricity?

- 1 Yes (Go to Q22a)
- 2 No (Skip to Q23)
- 88 Refused (Skip to Q23)
- 99 Don't know (Skip to Q23)

22a. Which specific appliance or equipment did you switch from natural gas or another fuel to electricity?

[OPEN END, DO NOT READ]

- 1 Water heater
- 2 Pool/spa heater
- 3 Stove / Range
- 4 Dryer
- 5 Heating system
- 6 Other (Specify): _____
- 88 Refused
- 99 Don't know

23. Can you think of any other factors or reasons that might have increased your electricity use last summer?

- 1 Yes (Go to Q23a)
- 2 No (Skip to Q24)
- 88 Refused (Skip to Q24)
- 99 Don't know (Skip to Q24)

23a. And what are these specific factors or reasons?

[OPEN END, DO NOT READ]

Other factors caused me to use more electricity:

- Additional people were at home 1
- Went away less often than previous summer 2
- Other factors (specify):
- #1: _____ 3
- #2: _____ 4
- #3: _____ 5

24. **[IF RESPONDENT PARTICIPATED IN SUMMER SAVINGS, I.E. CHECKED AT LEAST ONE ITEM AT Q6]**
 Would you say you are very concerned, somewhat concerned, not very concerned or not at all concerned about each of the following issues:

READ AND ROTATE

1 – Very concerned

2 – Somewhat concerned

3 – Not very concerned

4 – Not at all concerned

	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>Refused</u> <u>(88)</u>	<u>D/K</u> <u>(99)</u>
The environmental impacts of electricity generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The environmental impacts of electricity consumption by consumers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The environmental impacts of electricity consumption by business and industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. **[IF RESPONDENT PARTICIPATED IN SUMMER SAVINGS, I.E. CHECKED AT LEAST ONE ITEM AT Q6]**
 Do you think that individual consumers such as yourself can definitely, likely, likely not or definitely not make an important contribution to reducing the overall reduction of electrical energy use in the province?

- 1 Definitely
- 2 Likely
- 3 Likely not
- 4 Definitely not
- 5 Depends [DO NOT READ]
- 88 Refused [DO NOT READ]

99 Don't know [DO NOT READ]

26a. **[IF RESPONDENT PARTICIPATED IN SUMMER SAVINGS, I.E. CHECKED AT LEAST ONE ITEM AT Q6]**
Are you familiar with any standards or ratings currently in place that rate the energy efficiency of appliances?

[OPEN END, DO NOT READ]

1 Yes

2 No

88 Refused

1 Don't know

26b. **[IF YES AT Q26a]** And could you please tell me the names of the standards or ratings that you are familiar with?

[OPEN END, DO NOT READ]

2 Energuide

3 EnergyStar

3 Canadian Standards Association standards

77 Other (SPECIFY _____)

88 Refused

99 Don't know

27. **[IF RESPONDENT PARTICIPATED IN SUMMER SAVINGS, I.E. CHECKED AT LEAST ONE ITEM AT Q6]**
Have you ever heard the term "conservation culture"?

1 Yes

2 No

88 Refused [DO NOT READ]

99 Don't know [DO NOT READ]

28. **[IF RESPONDENT PARTICIPATED IN SUMMER SAVINGS, I.E. CHECKED AT LEAST ONE ITEM AT Q6]**
I'd like to read you a list of opinions that we often hear expressed. For each one, please tell me whether you totally agree, somewhat agree, somewhat disagree or totally disagree.

- 01 Totally agree
- 02 Somewhat agree
- 03 Somewhat disagree
- 04 Totally disagree
- 05 Neither agree nor disagree
- 06 Depends [DO NOT READ]
- 88 REFUSED [DO NOT READ]
- 99 DK [DO NOT READ]

READ AND ROTATE

	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>	<u>(6)</u>	<u>Refused</u> <u>(88)</u>	<u>D/K</u> <u>(99)</u>
I am prepared to pay more for an environmentally friendly product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To preserve people's jobs in this country, we must accept higher levels of pollution in the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have enough trouble worrying about my own problems without worrying about others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29. [IF RESPONDENT PARTICIPATED IN SUMMER SAVINGS, I.E. CHECKED AT LEAST ONE ITEM AT Q6]
 Now, thinking of your participation in the Summer Savings Program run by the Ontario Power Authority, could you please rate your level of agreement with the following statements. Please use a scale from 1 to 7 where 1 means strongly disagree and 7 means strongly agree. You can of course choose any number in between.

[ROTATE]

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>Refused</u>	<u>D/K</u>
The program has shown me that I can save energy and money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The program made me feel good about my ability to save energy and help protect the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My household didn't have to significantly adjust our current lifestyle in order to achieve energy savings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Without the financial incentives, I would have been unlikely to involve my household in an energy savings program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The program shows that individuals can make a difference in terms of energy consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 3 - DEMOGRAPHIC MODULE

The next several questions ask about differences in the number of people living or staying at your home in the summer of 2007 compared to the summer of 2006. As well as, differences in the amount of time people spent away from home.

30a. How many people, including children, other family members and permanent guests, lived in your home in the summer of 2007 (*last* summer)?

_____ people

[RECORD NUMBER]

88 Refused

99 Don't know

30b. How many people, including children, other family members and permanent guests, lived in your home in the summer of 2006 (the summer *before* last)?

[RECORD NUMBER]

88 Refused

99 Don't know

31a. Approximately how many weeks would you say the members of your household were away from home during Summer 2007 (last summer)?

_____ [RECORD # WEEKS – MIN:0; MAX:16]

88 Refused [DO NOT READ]

99 Don't know [DO NOT READ]

31b. And approximately how many weeks would you say the members of your household were away from home during Summer 2006 (the summer before last)?

_____ [RECORD # WEEKS – MIN:0; MAX:16]

88 Refused [DO NOT READ]

99 Don't know [DO NOT READ]

SECTION 4 – MODELLING QUESTIONS

32. (If action in Q6 = GRRP action OR action in Q11 = GRRP action OR Q20 = GRRP Action) When you disposed of / got rid of your second refrigerator / freezer, did you replace it with a new one?
- 1 Yes
 - 2 No
 - 88 Refused
 - 99 Don't know
33. What fuel do you currently use to heat your home? Is it . . .
- 1 Electric
 - 2 Natural Gas
 - 3 Propane
 - 4 Oil
 - 5 Wood
 - 6 Solar
 - 7 Geothermal, or
 - 8 Something else (Specify): _____
 - 88 Refused
 - 99 Don't know
34. What fuel do you currently use to heat your water for showers, baths, dishwashing and laundry? Is it . . .
- 1 Electric
 - 2 Natural Gas
 - 3 Propane
 - 4 Oil
 - 5 Wood
 - 6 Solar, or
 - 8 Something else (Specify): _____
 - 88 Refused
 - 99 Don't know

35. Which of the following types of homes do you currently live in? [Read list. Take one.]

- | | |
|------------------------------------|---|
| Single family detached house, | 1 |
| Single family semi-detached house, | 2 |
| Townhouse or rowhouse, | 3 |
| Duplex, triplex, fourplex, or | 4 |
| Condominium/apartment | 5 |
| Other [Don't read] (SPECIFY) | 6 |
| Refused [Don't read] | 9 |

36. Do you own or rent your home?

- | | |
|----|------------|
| 1 | Own |
| 2 | Rent |
| 88 | Refused |
| 99 | Don't know |

37. What is the approximate square footage of your home (including kitchen, bedrooms, bathrooms, foyers, dens and hallways)? The square footage of homes is often quoted to exclude the basement. Please include the basement in your estimate if it is a finished basement.

- | | |
|----|----------------------|
| 1 | Less than 1000 sq ft |
| 2 | 1001 to 1500 sq ft |
| 3 | 1501 to 2000 sq ft |
| 4 | 2001 to 2500 sq ft |
| 5 | 2501 to 3000 sq ft |
| 6 | 3001 to 3500 sq ft |
| 7 | 3501 to 4000 sq ft |
| 8 | more than 4000 sq ft |
| 88 | Refused |
| 99 | Don't know |

38. Finally, for statistical purposes only, please tell me which of the following broad categories best describes your total household income before taxes for the year 2007? **[Read list and select one]**

- | | |
|---------------------------------------|---|
| Under \$20,000 | 1 |
| \$20,000 to under \$40,000 | 2 |
| \$40,000 to under \$60,000 | 3 |
| \$60,000 to under \$80,000 | 4 |
| \$80,000 to under \$100,000 | 5 |
| \$100,000 and over | 6 |
| Prefer not to say [Don't read] | 9 |

39. **[if "CREDIT" -- = YES (received credit) and response to question 4 = 1 (recall receiving credit), then ask]** Would you be willing to have your conservation efforts publicly profiled by *[LDC Name (if using customer contact details from LDC) OR your local utility (if random telephone sample)]* to support a future conservation program. If you are willing, we will advise your *[LDC Name (if using customer contact details from LDC) OR your local utility (if random telephone sample)]* about your decision and they may contact you in the future.

- 1 Yes
- 2 No
- 3 Maybe, it depends what they are planning to say and how they are going to promote it
- 88 Refused
- 99 Don't know

40. **[FOR TORONTO & OTTAWA]** Have you lived in your current residence since July 2006 or earlier?

- 1 Yes
- 2 No
- 88 Refused
- 99 Don't know

Thank you very much. Your answers will help *[LDC Name (if using customer contact details from LDC) OR your local utility (if random telephone sample)]* and the Ontario Power Authority evaluate their energy efficiency efforts to better serve customers. Remember: your answers to this survey are confidential and will be used only for this research.