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ComEd Plan Year 4
Nicor Gas Plan Year 1
(6/1/2011-5/31/2012)

Evaluation Report:
Home Energy Efficiency Rebate Program

FINAL

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Commonwealth Edison Company and
Nicor Gas Company

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E. Executive Summary

E.1 Evaluation Objectives

This report summarizes Navigant's third-party evaluation of Nicor Gas' Rider 30 Home Energy Efficiency Rebate (Home EER) program. The evaluation was conducted in summer and fall of 2012, soon after the close of the Nicor Gas' first gas plan year (GPY1), which ran from June 1, 2011 through May 31, 2012. Commonwealth Edision (ComEd) also participates in the program and is in its fourth plan year (EPY4).

Navigant's work incorporated both

- An impact evaluation—estimating the program's energy savings impact in total therms, and
- A process evaluation— examining effectiveness of supporting processes

A primary objective of the detailed evaluation was to supply Nicor Gas managers with an independent post hoc assessment of earlier estimates of therm savings. Navigant's estimates are given in terms of verified gross and net savings attributable to the program, derived from applying both verification and net-to-gross (NTG) analysis processes.

A second objective is to assess the structure and performance of the program's record-keeping practices. Quality monitoring is a prerequisite for prudent program management, and it provides a form of redundancy in oversight by giving all team members the ability to detect a need for action. This report assesses the adequacy of tracking systems and recommends specific actions in a separate deliverable labeled "verification, due diligence and tracking system review." Program design and implementation are compared to industry best practices published by professional associations and approved by leading regulatory authorities.

A third objective of the evaluation is to assess process strengths and weaknesses, in order to help program managers enhance program performance. Processes were examined from the perspective of both customers and trade allies.

Described at the highest level, the Home EER program offers education and cash incentives to Nicor Gas and ComEd residential customers to encourage customer purchases of higher efficiency equipment. To be eligible for program rebates, customers must be active residential customers of Nicor Gas for gas rebates, and ComEd and Nicor Gas Customers to receive Complete System Rebate (CSR) rebates, and the premises must be used for residential purposes in existing buildings. Both rental and owner-occupied dwellings are eligible for rebates for natural gas furnaces, boilers and water heaters and central air conditioning systems.

E.2 Evaluation Methods

The study combined a mix of industry standard evaluation methods to meet the evaluation objectives. Details on each customer installation were obtained from the program tracking system and were used to analyze program impacts on energy use and participation rates.

A structured telephone survey gathered consumer decision data from 74 residential participants after they received equipment rebates. This was done to determine free ridership and spillover, as well as to assess processes affecting customer satisfaction. Because most of the program participants installed gas furnaces, most of the survey respondents were furnace purchasers, which included a subset of CSR participants.

Another 22 phone surveys were completed with HVAC installers, contractors and sales firms who participated as trade allies in the Nicor Gas Home EER program. Perceived customer satisfaction and areas for program improvement were among the topics covered.

Data collected by these evaluation methods were analyzed to answer both process and impact-related questions. The main focus of the impact evaluation was to review estimates of gross program savings and program tracking information, and to estimate net program savings. The process evaluation included a review of the program's administration and delivery as well as input from participant and trade ally surveys.

E.3 Key Impact Findings and Recommendations

Table E-1 shows the key results of the gross and net impact evaluation using deemed savings estimates.

Table E-1. GPY1 Deemed Savings Estimates

	Therm Savings
Ex-Ante Gross	1,591,644
Ex-Ante Net	1,115,441
Verified Gross	1,592,503
Verified Net	1,096,916
NTG Ratio	0.69

Navigant's review of the deemed savings calculations showed that Wisconsin Energy Conservation Corporation (WECC) used the Illinois Technical Resource Manual (IL TRM) algorithms correctly. There were some areas where Navigant made changes to the inputs, and

we have made recommendations addressing these areas below. The remaining impact recommendations relate to the tracking system and verification and due diligence review.

- **Location tracking.** The program currently uses a zip code map to allocate addresses to each county. A customer's county location is used to determine heat loads and thus, savings. Because some zip codes cross county lines, some customers have heating loads based on multiple counties. Navigant used GIS software to code each address to a single county, resulting in slightly different savings estimates for some customers. The program should consider mapping participants with the GIS software or proposing that the TRM use a standard list of zip codes by county to avoid confusion.

- **Domestic hot water heater energy factor.** Navigant found that there were some domestic hot water heaters which, due to their classification as commercial units, had ratings of thermal efficiency. In most cases, WECC correctly converted these values to energy factors, but Navigant found cases where the thermal efficiency was used and also some cases where the conversion was incorrect. The tracking of these efficiencies should be improved to avoid such oversights.

- **Tracking System Review.** Though the program is functioning well from the perspective of due diligence and tracking system set up, the evaluation team found room for improvement in the tracking system database extract. Navigant recommends that steps be taken to ensure that all information present on the application be included in the tracking database, and that steps be taken to coordinate tracking efforts between Nicor Gas and ComEd to ensure consistency in utility databases.

E.4 Key Process Findings and Recommendations

The primary process findings and recommendations are as follows:

Finding: Both trade allies and program participants report high levels of satisfaction with the program. However, there is still some perception that the application requirements are burdensome and complicated. One area of the program with lower levels of satisfaction was the length of time before receipt of the rebate, despite Nicor Gas meeting its goal that rebates are received within 14 days or fewer.

- **Recommendation:** Nicor Gas has taken steps to simplify and clarify the application, so Navigant will assess the success of the updated application process in GPY2. Navigant suggests expanding the use of the "instant discount" feature, which will allow the program to continue its success in meeting its goal of distributing rebates within 14 days.

Finding: Trade allies are instrumental in program promotion. The majority of participants were first made aware of the program through their contractors, and the trade allies are the party most responsible for explaining the program to participants.

- **Recommendation.** Navigant suggests that additional promotional material be provided to the trade allies, especially payback calculators, and that co-operative advertising be explored. Navigant also suggests that to ensure the continued successful partnership between Nicor Gas and trade allies, Nicor Gas consider creating a form of recognition for contributing trade allies.

Finding: Throughout the evaluation process, Navigant experienced some challenges with regards to trade ally evaluation survey responses.

- **Recommendation:** For GPY2 evaluations, Navigant plans to contact trade allies during a time of year where they are more likely to be available to speak, and also suggests that the participating trade allies be encouraged by the implementation staff - or potentially required as a condition of program participation - to participate in the program evaluation.

1. Introduction to the Program

1.1 Program Description

Under the Rider 30 Home Energy Efficiency Rebate (Home EER) program, cash incentives and education were offered to encourage upgrading of water- and space-heating equipment among residential customers of Nicor Gas, and air conditioning systems for ComEd customers through the complete system replacement (CSR) portion of the program. The Home EER program was designed to conserve natural gas and electricity, and lower participants' monthly energy bills. Both rental and owner-occupied dwellings are eligible for rebates for furnaces, boilers, water heaters, and air conditioning systems. Customers must be active residential customers of Nicor Gas in order to receive rebates for gas saving measures, or Nicor Gas and ComEd to receive rebates for high efficiency furnaces and air conditioning systems under the CSR portion of the program, and the premises must be used for residential purposes in existing buildings.

The Home EER program promises customers a quick turn-around rebate to invest in long-term savings through better technology. Rebates are offered for the installation of high-efficiency furnaces, boilers, water heaters, and air conditioning systems. The dollar amount of the rebate depends on the size and efficiency of the replacement measures.

The Rider 30 Home EER program ran from June 1, 2011 through May 30, 2012. The CSR portion of the Home EER program began in from January 1, 2012. Table 1-1 summarizes Nicor Gas' Rider 30 Home EER program's goals. ComEd's CSR goals will be discussed in an addendum report that will include ComEd electric impacts and research topics that are specific to ComEd.

Table 1-1. Key Performance Goals Planned for the Residential Rebate Program

Program Metric	Goal
Gross Savings, Therms	2,064,100
Net Savings, Therms	1,459,670
Participating Units	16,700
Budget/Expenditures	$5,587,612

Source: *Nicor Gas Energy Efficiency Plan 2011-2014*, May 2011

The Home EER Program goal for gross therm savings represented 21% of target for the entire Rider 30 portfolio.

1.1.1 Implementation Strategy

The field organization that delivered the Rider 30 Home EER program to Nicor Gas customers included long-established firms in the energy efficiency services sector. The same contractors had been retained from the Rider 29 efforts. Administration of the Residential Rebate program is under contract to the Wisconsin Energy Conservation Corporation (WECC); program implementation is managed by Resource Solutions Group (RSG) of California; Fulfillment and Call Center are managed by the Electric and Gas Industries Association (EGIA) (Table 1-2). RSG's assigned tasks specifically included promotion, sales assistance and rebate processing. This includes the majority of the trade ally outreach, and trade ally management.

Table 1-2. Roles of organizations in Residential Rebate program operations

Organization	Role
Wisconsin Energy Conservation Corporation (WECC)	Administrator
Resource Solutions Group (RSG)	Program Implementer
Electric and Gas Industries Association (EGIA)	Fulfillment and Call Center

More than 2,000 trade ally firms participated in the program, both promoting the program to their customers and installing the rebated measures. Rebates were of two major types: "instant discount" paid directly to the installer after written agreement by the customer; and rebate checks mailed to the customer. On-line applications were available as well as in PDF format on the Nicor Gas website and paper copies were available from installers and other parties.

1.1.2 Measures and Incentives

Five types of gas-using equipment were eligible for rebates through the program ranging from $200 for a high efficiency storage water heater to $450 for an upper tier high efficiency boiler. Two types of central air conditioning systems were eligible for rebates as part of the CSR portion of the program. Equipment types and rebate amounts for GPY1 are in Table 1-3 below.

Table 1-3. Rebate Amounts for Eligible Equipment

Equipment	Rebate Amount
Storage Water Heater Energy Factor ≥ 0.67	$200
High Efficiency Furnace AFUE ≥ 92%	$200
High Efficiency Furnace AFUE ≥ 95%	$250
High Efficiency Boiler AFUE ≥ 90%	$350
High Efficiency Boiler AFUE ≥ 95%	$450
Central Air Conditioning System: Evaporator Coil & Condenser Unit SEER ≥ 14.5	$400

1.2 *Evaluation Questions*

The objectives of the GPY1 Home EER program evaluation were to (1) quantify net savings impacts from the program; (2) identify ways in which the program can be improved, and (3) determine process-related program strengths and weaknesses. To achieve this, the GPY1 evaluation sought to answer the following researchable issues:

1.2.1 Impact Issues

1. What is the level of gross annual therm savings achieved by the program?
2. What were the realization rates? (Defined as evaluation-verified savings divided by program-reported (ex-ante) savings.)
3. What are the net impacts from the program?
4. What is the level of free ridership associated with this program and how can it be reduced?
5. What is the level of spillover associated with this program?
6. Did the program meet its energy savings goals? If not, why not?

1.2.2 Process Issues

1. How did customers become aware of the program?

2. What marketing strategies could boost program awareness?
3. What are key barriers to participation in the program for eligible customers who do not participate, and how can these be addressed by the program?
4. What is the effectiveness of program implementation and outreach?
5. What role did trade allies play in recruiting and enrolling residential applicants?
6. Is there an opportunity to engage more trade allies?
7. How effective are the program design and processes?
8. What have been the customer and program partner experiences with the program?
9. Are customers and program partners satisfied with the program?
10. What opportunities exist for program improvement?

2. Evaluation Methods

2.1 *Primary Data Collection*

This section describes the methods of data collection and analysis used in the process and impact evaluation of the Rider 30 Home Energy Efficiency Rebate program. This section also identifies the data sources and what sampling methods were used to protect against bias.

The main focus of the impact evaluation included a review of deemed savings algorithms and program tracking information. The process evaluation included an assessment of the effectiveness of the program's administration and delivery.

Navigant's evaluation of Nicor Gas' Rider 30 Home EER program also included a survey of 70trade allies to obtain deeper information about how the program was working for the trade allies, Nicor Gas' primary program marketing arm. These surveys also solicited contractor input on perceived customer satisfaction and how the program can be improved.

Table 2-1. Data Collection Activities

Collection Method	Subject Data	Quantity	Gross Impact	Net Impact	Process
Telephone Surveys	Program participants	74	X	X	X
In-Depth Interviews	Program administrators and implementation contractor staff	2			X
Telephone Surveys	HVAC Contractors	53 participating trade allies for NTG analysis, 23 participating trade allies for process analysis, 4 non-participating trade allies, 4 formerly participating trade allies		X	X
Deemed Savings Review	Deemed savings estimates	All	X		

Collection Method	Subject Data	Quantity	Gross Impact	Net Impact	Process
Metering and Verification	Furnace Participants	39	X		

The sample structure shown in Table 2-2 was designed to achieve an estimate with two-sided confidence interval of 90%, and with overall relative precision of 10%.

Table 2-2. Stratified Sample Design for Participants, CI = 90%

Measure	Participants	Samples
90% AFUE Boiler	30	8
95% AFUE Boiler	43	10
92% AFUE Furnace	891	8
95% AFUE Furnace	8,839	40
0.67 EF Water Heater	524	8
Total		**74**

Incomplete tracking data made many participant records unusable. More detail about the missing tracking data can be found in the Verification and Due Diligence Memo in the appendix. The actual total records used for the analysis are shown below in Table 2-3.

Table 2-3. Actual Sample Structure, CI = 90%

Measure	Participants	Samples
90% AFUE Boiler	30	7
95% AFUE Boiler	43	10
92% AFUE Furnace	105	8
95% AFUE Furnace	1,216	40
0.67 EF Water Heater	64	9
Total		**74**

Navigant also completed twenty-three trade ally surveys. The trade allies were stratified into three groups, based on the total savings that each trade ally was responsible for. Each stratum accounted for a third of the program savings. The first stratum contained the 27 highest

volume trade allies, the second stratum contained 113 "medium" volume trade allies, and the third stratum consisted of the 1,319 lowest volume trade allies.

Table 2-4. Stratified Sample Design for Trade Allies, CI = 90%

Strata	Trade Allies	Sample
Highest Volume Trade Allies	27	13
Medium Volume Trade Allies	113	19
Lowest Volume Trade Allies	1,319	21
Total	**1,459**	**53**

Navigant also interviewed four non-participating contractors.

2.2 *Additional Research*

2.2.1 Verification and Due Diligence

Under this task, the Navigant team reviewed quality assurance/quality control (QA/QC) activities already in place to determine:

- Whether eligibility criteria had been properly adhered to and applications were appropriately completed and backed with supporting documentation. If any QA/QC activities were biased (e.g.., sampling that may inadvertently skew results)
- Whether savings were calculated correctly and project information entered in an accurate and timely manner in the tracking system
- Whether improvements and evaluation recommendations from the program planning phase have been implemented

2.2.2 Tracking Systems

The Navigant team performed an independent verification of the program tracking database to determine the appropriate level of input and the existence of outliers, missing values, and potentially missing variables. The purpose of the tracking system review was to ensure these systems gather the data required to support future evaluations and allow program managers to monitor key aspects of program performance at regular intervals. If necessary, the Navigant team included recommendations for additional fields to be added to the tracking system for use in future evaluation activities.

2.3 Impact Evaluation Methods

The gross savings impact evaluation consisted of two pieces: the deemed savings estimates, which are described in the main body of this report, and the research savings estimates, which are presented in Appendix 5.2. For the deemed savings estimates, Navigant calculated independent estimates of the savings for each measure based on the Illinois Technical Reference Manual (IL TRM). Navigant used the tracking data for participant location and equipment specifications.

In addition to providing verified savings estimates, Navigant also conducted a verification, due diligence, and tracking system review. This included in-depth review of the tracking system and program operations documentation, as well as in-depth interviews with program staff.

3. Evaluation Results

3.1 *Impact Evaluation Results*

3.1.1 Verification and Due Diligence Procedure Review

The evaluation team found that the Home Energy Efficiency Rebate program had a strong foundation in its first year. WECC, RSG, and EGIA established sufficient verification and due diligence processes to insure project eligibility criteria were met. The operations manual laid out both the program process and QA/QC plans. Navigant's in-depth interview with the administration and implementation program manager confirmed that key performance indicator goals established in the manual were being put into practice in the program and that quality assurance and verification procedures were being followed as well.

Clear QA/QC procedures are outlined in the operations manual. However, the operations manual did not outline procedures for dealing with situations where customers may have complaints against the trade allies. The team recommends establishing clear procedures for resolving these issues, including procedures for talking with contractors to resolve problems.

3.1.2 Tracking System Review

Though the program is functioning well from the perspective of due diligence and tracking system set up, the evaluation team found room for improvement in the tracking system database extract.

Navigant suggests that steps should be taken to ensure that all of the information included on the participant application be included in the tracking database, especially customer contact information such as telephone numbers. A review of thirty program applications revealed that twenty-three of them had customer contact telephone numbers on the application, but not in the tracking database. Most of the customers (86%) in the tracking database had no telephone numbers and over three quarters of them (78%) had no contact information (telephone number or email address). Navigant also noticed that some information was entered inconsistently throughout the tracking system, such as contractor names and addresses.

The tracking database appeared to contain some superfluous data entry fields. Navigant recommends the removal of unnecessary data fields and ensuring that placeholder values are created in a way that will not cause miscalculations in the future, and also including the results of the on-site inspection in the tracking database.

Navigant also suggests that improvements can be made in coordinating the tracking information between Nicor Gas and ComEd. The tracking databases are not consistent between

the utilities, making comparisons between them difficult. Navigant suggests that step be taken to standardize data tracking, such as the fields tracked, the formatting of fields tracked, and the program year participation definition, across both utilities. . For example, one program may use installation date as a cutoff, but another might use receipt of application. .

3.1.3 Gross Program Impact Results

3.1.3.1 High Efficiency Furnaces

The program rebates furnaces at two efficiency levels: greater than 92% AFUE and greater than 95% AFUE. For both measures, WECC correctly used the TRM algorithm for residential furnaces:

$$\Delta Therms = (Gas\ Furnace\ Heating\ Load) * \left(\frac{1}{AFUE_{Base}} - \frac{1}{AFUE_{Eff}}\right)$$

As illustrated in Table 3-1 and Table 3-2, the ex-ante and verified values for each gross impact parameter are nearly identical for both efficiency levels. Navigant's heating load estimate differed slightly due to the method of mapping participants to counties. The ex-ante numbers were provided to Navigant by WECC, and the verified numbers were calculated by Navigant.

Table 3-1. Furnace ≥ 92% AFUE Gross Impact Parameters

Parameter	Ex-Ante Estimate	Verified Estimate	Comments
$AFUE_{base}$	80%	80%	Per TRM
$AFUE_{ee}$	92.9%	92.9%	Tracking database average
Gas Furnace Heating Load	804	804	Average based on participant mapping
Gross Therm Savings	140	140	Average of measure participants

Table 3-2. Furnace ≥ 95% AFUE Gross Impact Parameters

Parameter	Ex-Ante Estimate	Verified Estimate	Comments
$AFUE_{base}$	80%	80%	Per TRM
$AFUE_{ee}$	95.4%	95.4%	Tracking database average
Gas Furnace Heating Load	805	806	Average based on participant mapping
Gross Therm Savings	163	163	Average of measure participants

3.1.3.2 *High Efficiency Boilers*

The program rebates boilers at two efficiency levels: greater than 90% AFUE and greater than 95% AFUE. For both measures, WECC correctly used the TRM algorithm for residential boilers:

$$\Delta Therms = (Gas\ Boiler\ Load) * \left(\frac{1}{AFUE_{Base}} - \frac{1}{AFUE_{Eff}}\right)$$

As illustrated in Table 3-3 and Table 3-4, the ex-ante and verified values for each gross impact parameter are nearly identical for both efficiency levels. Navigant's heating load estimate differed slightly due to the method of mapping participants to counties.

Table 3-3. Boiler ≥ 90% AFUE Gross Impact Parameters

Parameter	Ex-Ante Estimate	Verified Estimate	Comments
$AFUE_{base}$	80%	80%	Per TRM
$AFUE_{ee}$	91.9%	91.9%	Tracking database average
Gas Boiler Heating Load	1222	1218	Average based on participant mapping
Gross Therm Savings	198	197	Average of measure participants

Table 3-4. Boiler ≥ 95% AFUE Gross Impact Parameters

Parameter	Ex-Ante Estimate	Verified Estimate	Comments
$AFUE_{base}$	80%	80%	Per TRM
$AFUE_{ee}$	95.5%	95.5%	Tracking database average
Gas Boiler Heating Load	1215	1215	Average based on participant mapping
Gross Therm Savings	247	247	Average of measure participants

3.1.3.3 *High Efficiency Water Heaters*

The Home EER program incents the installation of gas storage hot water heaters that meet or exceed the minimum ENERGY STAR energy factor of 0.67. WECC correctly used the TRM algorithm for residential hot water heaters:

$$\Delta Therms = \left(\frac{1}{EF_{Base}} - \frac{1}{EF_{Eff}}\right) * \frac{[GDP * 365.25 * \gamma Water * (T_{out} - T_{in}) * 1.0]}{100{,}000}$$

This algorithm can be simplified as shown below given constant, deemed assumptions for GPD, γWater, T_{OUT} and T_{IN}:[1]

$$\Delta Therms = \left(\frac{1}{EF_{Base}} - \frac{1}{EF_{Eff}}\right) * (Water\ Heating\ Load)$$

As shown in Table 3-5, the only parameter where Navigant's estimate differed from WECC's was the high efficiency energy factor, $EF_{EFFICIENT}$. Navigant observed several units that were given thermal efficiency ratings due to their status as commercial equipment. While WECC converted some of these thermal efficiencies to energy factors using an industry standard calculator, some units' energy factors were not converted correctly or at all due to the limited time available to convert ex ante estimates to TRM values. Correcting this reduced the average energy factor installed.

Table 3-5. Water Heater Gross Impact Parameters

Parameter	Ex-Ante Estimate	Verified Estimate	Comments
EF_{BASE}	0.588	0.588	Per TRM
$EF_{EFFICIENT}$	0.678	0.675	Tracking database average
Water Heating Load	108	108	Per TRM
Gross Therm Savings	24.6	23.8	Average of measure participants

3.1.4 Net Program Impact Parameter Estimates

3.1.4.4 Free Ridership

Free ridership (FR) is a deduction from gross program savings due to the identified "lack of influence" of the program in the customer's decision making process. For the Home EER program, free ridership questions were asked of each of the participating customers surveyed, as well as of the participating trade allies surveyed. Navigant developed a combined Net-to-Gross ratio (NTGR) using both information sources.

A detailed explanation of the methodology used to calculate free ridership and spillover is in Appendix 5.3.

[1] GPD = 50 gallons per day, γWater = 8.33 lb/gal°F, T_{OUT} = 125°F and T_{IN} = 54°F

Navigant's participant sample was designed to obtain appropriate precision and confidence at the program level. The participants were then stratified by measure to mirror each measure's share of PY1 program savings. Free-ridership was averaged for each measure to calculate the Net-to-Gross ratio. Measure level results for furnaces with greater than 95% AFUE, which were the only statistically significant measure level results, and the overall program FR rate are shown in Table 3-6.

Table 3-6. Participant Free-ridership Results by Measure

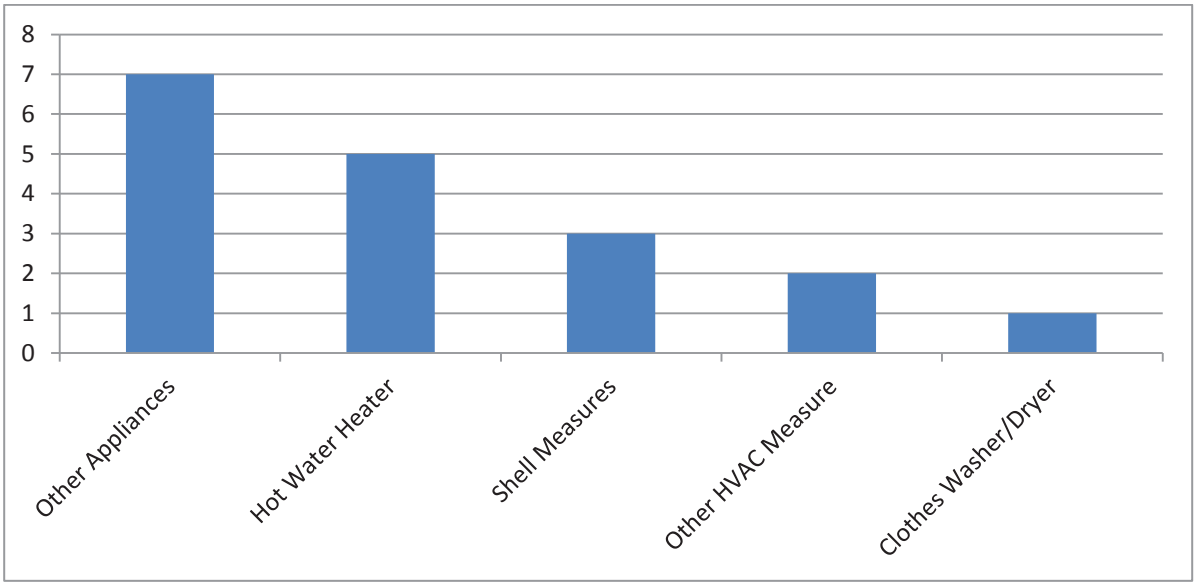
Measure	Free-ridership	Number of Participants Surveyed
95% AFUE Furnaces	0.40	40
Weighted Average	**0.38**	**74**

As a point of information for Navigant's GPY2 approach in spite of the small sample, the team is reporting their findings from the small trade ally sample in this report. The trade allies were asked about their perception of participant free-ridership (detail methodology can be found in Appendix 5.3). However, since most trade allies offer all or almost all measures to their customers, is was not possible to distinguish their perception of free ridership by measure. Overall for the program, the free ridership rate calculated from the trade ally survey, weighted by trade ally savings, was 0.35.

3.1.4.5 Spillover

To gauge program spillover, program participants were asked if they had purchased and installed any additional energy efficiency measures since their participation in the Home EER program. Eighteen of the participants stated that they had installed additional energy efficiency measures, with energy efficient appliances being the most common, followed by energy efficient hot water heaters. There does not appear to be any like measure spillover, which is to be expected given the nature of the program. Figure 3-1 presents the distribution of additional energy efficiency measures installed. One-third (6) of these participants reported that they received a rebate for the additional energy efficiency measures that they installed.

Figure 3-1. Energy Efficient Measures Installed Since Program Participation



These participants were also asked if their participation in the Home EER program had any influence on their decision to install the additional energy efficiency measures. The majority reported that the program had no effect. However, four of the six participants who received rebates for their additional measures reported that the program was "very influential" on their decision. All four of these participants received a rebate for their additional measure through another incentive program.

From these results, it can be concluded that while there is no demonstrative evidence that participation on the Home EER program increases the adoption of non-incented energy efficient technologies, there is some evidence that participation in the Home HEER program does lead to participation in other energy efficiency programs.

Navigant did find non-participant spillover based upon the trade allies' feedback; however, due to the small sample the findings are not reflected in Navigant's estimated NTGR for PY1. To gauge program non-participants' spillover, the trade allies were asked what percentage of their customers who purchased high efficiency equipment did not participate in the program, and how influential their own recommendation and the program materials were on the decision to purchase the high efficiency equipment. Trade ally responses yielded an estimated non-participant spillover of 0.06.

3.1.4.6 Final Net to Gross Ratio

The NTGR for program participants was calculated for each measure as follows:

$$NTGR_{Participant} = 1 - \%FR_{Participant} + \%SO_{Participant}$$

Table 3-7 presents the results for each measure, and the program average weighted by measure program savings.

Table 3-7. Participant Net-to-Gross Ratios

Weighted Average NTGR
0.62

As a point of reference, if the program NTGR had been calculated based on the trade ally survey findings and those findings alone[2], it would have been calculated as follows:

$$NTGR_{Trade\ Ally} = 1 - \%FR_{Trade\ Ally} + \%SO_{Trade\ Ally}$$

Had the NTGR been calculated solely from the results of the trade ally survey the results would have been:

$$1 - 0.37 + 0.06 = 0.70$$

Table 3-8. Trade Ally Net-to-Gross Ratios

Weighted Average NTGR
0.70

The overall program NTG was calculated by averaging the participant and the trade ally free-ridership rates, and then adding the participant and trade ally spillover, as follows:

$$NTGR_{Program} = 1 - \frac{(FR_{Part.} + FR_{TA})}{2} + SO_{Part.} + SO_{TA}$$

[2] This information is only provided as illustrative of the trade ally feedback representing less than 5% of program savings only. Navigant does not plan to calculate a pure trade ally NTG in PY2 but rather a blend of participant and trade ally results, specifically an average of FR results plus participant reported spillover and trade ally non-participant spillover.

The resulting program NTG rate is as follows:

$$1 - (0.38 + 0.37)/2 + 0 + 0.06 = 0.69$$

Table 3-9. Program Net-to-Gross Ratios

NTGR
0.69

3.1.5 Net Program Impact Results

Table 3-10 shows the net verified therm savings for each measure in the Home EER program for GPY1.

Table 3-10. Net Verified Savings Estimates for EPY1 Home EER Program

Measure	Gross Verified Savings	NTGR	Net Verified Savings
Program Total	**1,592,503**	**0.69**	**1,096,916**

3.2 Process Evaluation Results

This section discusses the process results obtained from the program participant and trade ally interviews. More detailed results can be found in Appendix 5.4.

- The majority (56%) of customers were first made aware of the program through their contractors, followed by Nicor Gas bill inserts (14%) and the internet, including the Nicor Gas website. To boost program awareness, Nicor Gas can increase the amount of advertising the program receives, including potentially offering cooperative advertising with trade allies, additional bill inserts, and increased use of media advertising, such as radio and television ads.

- The main barrier to participation in the program, for both customers and trade allies, is the application process, which is perceived as being complicated and burdensome. Nicor Gas has taken steps to improve and clarify the program application for GPY2, which should help alleviate this barrier. Navigant suggests that additional steps be taken to clarify the specific makes and models of qualifying equipment, including ensuring that trade allies are aware of the information available to them on the Nicor

Gas website. The non-participating trade allies that Navigant interviewed stated that the main reason for their own non-participation was the paperwork associated with the rebate process. A few of the non-participating trade allies also were skeptical that they would receive any benefit from participating in the program. If Nicor Gas were able to provide an explanation of benefits of the program to trade allies, it would help encourage more of them to participate. Nicor Gas should also ensure that trade allies are aware of the materials available to them on the Nicor Gas website.

- Program outreach to customers has been effective in increasing awareness of the existence of the program, but not in explaining the details of the program to the customers. For example, customers may be aware of the fact that Nicor Gas does offer rebates on new furnaces, but they are not aware of the specific requirements of the program. Since the program relies heavily on the trade allies to explain and market the program to customers, it may not be necessary to provide additional outreach to explain the details of the program to customers; however, it is important that trade allies be made aware of all the promotional materials available to them, especially through the Nicor Gas website.

- The role of the trade ally in the Home EER program is instrumental in both marketing the program and assisting customers in the application process. A majority of customers stated that the trade ally was "highly influential" in their decision to participate in the program. Because the trade allies are so crucial to the success of the program, Navigant suggests that Nicor Gas consider implementing either a trade ally incentive or some form of recognition for the participating trade allies. Recognition of appreciation for the work that the trade allies do for the program would ensure their continuing cooperation and participation, which are vital to the continued success of the program.

- The program design and processes have been found to be quite successful in helping to achieve the program's goals. Both the trade allies and the customers report high levels of satisfaction with the program. Overall, the customers reported that their experiences with the program were very positive. The area with lower levels of satisfaction was the speed at which customers received their rebates from Nicor Gas, even though Nicor Gas has consistently hit its goal of sending out rebates within 14 days of receiving the request. To increase customer satisfaction in this area, Nicor Gas should consider expanding trade ally use of the "instant discount" by promoting the benefits of the instant discount to non-contractor circle trade allies. Also, several trade allies suggested

expanding the measures included in the program, and specifically mentioned adding instantaneous water heaters as a possible measure for inclusion.

4. Findings and Recommendations

4.1 Key Impact Findings and Recommendations

Table 4-1 shows the key results of the gross and net impact evaluation using deemed savings estimates.

Table 4-1. GPY1 Deemed Savings Estimates

	Therm Savings
Ex-Ante Gross	1,591,644
Ex-Ante Net	1,115,441
Verified Gross	1,592,494
Verified Net	1,096,916

Navigant's review of the deemed savings calculations showed that WECC used the TRM algorithms correctly. There were some areas where Navigant made changes to the inputs, and we have made recommendations addressing these areas below. The remaining impact recommendations relate to the tracking system and verification and due diligence review.

Finding: The program currently uses a zip code map to allocate addresses to each county. Because some zip codes cross county lines, some customers have heating loads based on multiple counties.

- **Recommendation:** Navigant used GIS software to code each address to a county, resulting in slightly different savings estimates for some customers. The program should consider mapping participants with this method or proposing the TRM use a standard list of zip codes by county to avoid confusion.

Finding: Navigant found that there were some domestic hot water heaters which, due to their classification as commercial units, had ratings of thermal efficiency. In most cases WECC correctly converted these values to energy factors, but Navigant found cases where the thermal efficiency was used and also some cases where the conversion was incorrect.

- **Recommendation:** The tracking of these efficiencies should be improved to avoid such oversights.

Finding: Though the program is functioning well from the perspective of due diligence and tracking system set up, the evaluation team found room for improvement in the tracking system database extract.

- **Recommendation:** Navigant recommends that steps be taken to ensure that all information present on the application be included in the tracking database, and that steps be taken to coordinate tracking efforts between Nicor Gas and ComEd to ensure consistency in utility databases.

4.2 Key Process Findings and Recommendations

The primary process findings and recommendations are as follows:

Finding: Both the trade allies and the program participants report high levels of satisfaction with the program. However, there is still some perception that the application requirements are burdensome and complicated. One area of the program with lower levels of satisfaction was the length of time before receipt of the rebate.

- **Recommendation:** Nicor Gas has taken steps to simplify and clarify the application, so Navigant will assess the success of the updated application process in GPY2. Navigant suggests expanding the use of the "instant discount" feature.

Finding: The trade allies are instrumental in program promotion. The majority of participants were first made aware of the program through their contractors, and the trade allies are the party most responsible for explaining the program to the participants.

- **Recommendation.** Navigant suggests that additional promotional material be provided to the trade allies, especially payback calculators, and that co-operative advertising be explored. Navigant also suggests that to ensure the continued successful partnership between Nicor Gas and the trade allies, that Nicor Gas considers creating a form of recognition for contributing trade allies.

Finding: Throughout the evaluation process, Navigant experienced some challenges with regards to trade ally evaluation survey responses.

- **Recommendation:** For GPY2 evaluations, Navigant plans to contact trade allies during a time of year where they are more likely to be available to speak, and also suggests that the participating trade allies be encouraged by the implementation staff - or potentially required as a condition of program participation - to participate in the program evaluation.

5. Appendix

5.1 Glossary

High Level Concepts

Program Year

- EPY1, EPY2, etc. Electric Program Year where EPY1 is June 1, 2008 to May 31, 2009, EPY2 is June 1, 2009 to May 31, 2010, etc.
- GPY1, GPY2, etc. Gas Program Year where GPY1 is June 1, 2011 to May 31, 2012, GPY2 is June 1, 2012 to May 31, 2013.

There are two main tracks for reporting impact evaluation results, called Verified Savings and Impact Evaluation Research Findings.

Verified Savings composed of

- Verified Gross Energy Savings
- Verified Gross Demand Savings
- Verified Net Energy Savings
- Verified Net Demand Savings

These are savings using deemed savings parameters when available and after evaluation adjustments to those parameters that are subject to retrospective adjustment for the purposes of measuring savings that will be compared to the utility's goals. Parameters that are subject to retrospective adjustment will vary by program but typically will include the quantity of measures installed. In EPY4/GPY1 ComEd's deemed parameters were defined in its filing with the ICC. The Gas utilities agreed to use the parameters defined in the TRM, which came into official force for EPY5/GPY2.

Application: When a program has deemed parameters then the Verified Savings are to be placed in the body of the report. When it does not (e.g., Business Custom, Retro-commissioning), the evaluated impact results will be the Impact Evaluation Research Findings.

Impact Evaluation Research Findings composed of

- Research Findings Gross Energy Savings
- Research Findings Gross Demand Savings
- Research Findings Net Energy Savings
- Research Findings Net Demand Savings

These are savings reflecting evaluation adjustments to any of the savings parameters (when supported by research) regardless of whether the parameter is deemed for the verified savings analysis. Parameters that are adjusted will vary by program and depend on the specifics of the research that was performed during the evaluation effort.

Application: When a program has deemed parameters then the Impact Evaluation Research Findings are to be placed in an appendix. That Appendix (or group of appendices) should be labeled Impact Evaluation Research Findings and designated as "ER" for short. When a program does not have deemed parameters (e.g., Business Custom, Retro-commissioning), the Research Findings are to be in the body of the report as the only impact findings. (However, impact findings may be summarized in the body of the report and more detailed findings put in an appendix to make the body of the report more concise.)

Program-Level Savings Estimates Terms

N	Term Category	Term to Be Used in Reports‡	Application†	Definition	Otherwise Known As (terms formerly used for this concept)§
1	Gross Savings	Ex-ante gross savings	Verification and Research	Savings as recorded by the program tracking system, unadjusted by realization rates, free ridership, or spillover.	Tracking system gross
2	Gross Savings	Verified gross savings	Verification	Gross program savings after applying adjustments based on evaluation findings for only those items subject to verification review for the Verification Savings analysis	Verified gross, Evaluation adjusted gross
3	Gross Savings	Verified gross realization rate	Verification	Verified gross / tracking system gross	Realization rate
4	Gross Savings	Research Findings gross savings	Research	Gross program savings after applying adjustments based on all evaluation findings	Evaluation-adjusted verified gross savings
5	Gross Savings	Research Findings gross realization rate	Research	Research findings gross / ex-ante gross	Realization rate
6	Gross Savings	Evaluation-Adjusted gross savings	Non-Deemed	Gross program savings after applying adjustments based on all evaluation findings	Evaluation-adjusted verified gross savings
7	Gross Savings	Gross realization rate	Non-Deemed	Evaluation-Adjusted gross / ex-ante gross	Realization rate
1	Net Savings	Net-to-Gross Ratio (NTGR)	Verification and Research	1 – Free Ridership + Spillover	NTG, Attribution
2	Net Savings	Verified net savings	Verification	Verified gross savings times NTGR	Verified net
3	Net Savings	Research Findings net savings	Research	Research findings gross savings times NTGR	Verified net
4	Net Savings	Evaluation Net Savings	Non-Deemed	Evaluation-Adjusted gross savings times NTGR	Verified net
5	Net Savings	Ex-ante net savings	Verification and Research	Savings as recorded by the program tracking system, after adjusting for realization rates, free ridership, or spillover and any other factors the program may choose to use.	Program-reported net savings

‡ "Energy" and "Demand" may be inserted in the phrase to differentiate between energy (kWh, Therms) and demand (kW) savings.

† **Verification** = Verified Savings; **Research** = Impact Evaluation Research Findings; **Non-Deemed** = impact findings for programs without deemed parameters. We anticipate that any one report will either have the first two terms or the third term, but never all three.

§ Terms in this column are not mutually exclusive and thus can cause confusion. As a result, they should not be used in the reports (unless they appear in the "Terms to be Used in Reports" column).

Individual Values and Subscript Nomenclature

The calculations that compose the larger categories defined above are typically composed of individual parameter values and savings calculation results. Definitions for use in those components, particularly within tables, are as follows:

Deemed Value – a value that has been assumed to be representative of the average condition of an input parameter and documented in the Illinois TRM or ComEd's approved deemed values. Values that are based upon a deemed measure shall use the superscript "D" (e.g., delta watts^{D}, HOU-Residential^{D}).

Non-Deemed Value – a value that has not been assumed to be representative of the average condition of an input parameter and has not been documented in the Illinois TRM or ComEd's approved deemed values. Values that are based upon a non-deemed, researched measure or value shall use the superscript "E" for "evaluated" (e.g., delta watts^{E}, HOU-Residential^{E}).

Default Value – when an input to a prescriptive saving algorithm may take on a range of values, an average value may be provided as well. This value is considered the default input to the algorithm, and should be used when the other alternatives listed for the measure are not applicable. This is designated with the superscript "DV" as in X^{DV} (meaning "Default Value").

Adjusted Value – when a deemed value is available and the utility uses some other value and the evaluation subsequently adjusts this value. This is designated with the superscript "AV" as in X^{AV}

Glossary Incorporated From the TRM

Below is the full Glossary section from the TRM Policy Document as of October 31, 2012[3].

Evaluation: Evaluation is an applied inquiry process for collecting and synthesizing evidence that culminates in conclusions about the state of affairs, accomplishments, value, merit, worth, significance, or quality of a program, product, person, policy, proposal, or plan. Impact evaluation in the energy efficiency arena is an investigation process to determine energy or demand impacts achieved through the program activities, encompassing, but not limited to: *savings verification*, *measure level research*, and *program level research*. Additionally, evaluation may occur outside of the bounds of this TRM structure to assess the design and implementation of the program.

Synonym: **Evaluation, Measurement and Verification (EM&V)**

> **Measure Level Research**: An evaluation process that takes a deeper look into measure level savings achieved through program activities driven by the goal of providing Illinois-specific research to facilitate updating measure specific TRM input values or algorithms. The focus of this process will primarily be driven by measures with high savings within Program Administrator portfolios, measures with high uncertainty in TRM input values or algorithms

[3] IL-TRM_Policy_Document_10-31-12_Final.docx

(typically informed by previous savings verification activities or program level research), or measures where the TRM is lacking Illinois-specific, current or relevant data.

Program Level Research: An evaluation process that takes an alternate look into achieved program level savings across multiple measures. This type of research may or may not be specific enough to inform future TRM updates because it is done at the program level rather than measure level. An example of such research would be a program billing analysis.

Savings Verification: An evaluation process that independently verifies program savings achieved through prescriptive measures. This process verifies that the TRM was applied correctly and consistently by the program being investigated, that the measure level inputs to the algorithm were correct, and that the quantity of measures claimed through the program are correct and in place and operating. The results of savings verification may be expressed as a program savings realization rate (verified savings / ex ante savings). Savings verification may also result in recommendations for further evaluation research and/or field (metering) studies to increase the accuracy of the TRM savings estimate going forward.

Measure Type: Measures are categorized into two subcategories: custom and prescriptive.

Custom: Custom measures are not covered by the TRM and a Program Administrator's savings estimates are subject to retrospective evaluation risk (retroactive adjustments to savings based on evaluation findings). Custom measures refer to undefined measures that are site specific and not offered through energy efficiency programs in a prescriptive way with standardized rebates. Custom measures are often processed through a Program Administrator's business custom energy efficiency program. Because any efficiency technology can apply, savings calculations are generally dependent on site-specific conditions.

Prescriptive: The TRM is intended to define all prescriptive measures. Prescriptive measures refer to measures offered through a standard offering within programs. The TRM establishes energy savings algorithm and inputs that are defined within the TRM and may not be changed by the Program Administrator, except as indicated within the TRM. Two main subcategories of prescriptive measures included in the TRM:

Fully Deemed: Measures whose savings are expressed on a per unit basis in the TRM and are not subject to change or choice by the Program Administrator.

Partially Deemed: Measures whose energy savings algorithms are deemed in the TRM, with input values that may be selected to some degree by the Program Administrator, typically based on a customer-specific input.

In addition, a third category is allowed as a deviation from the prescriptive TRM in certain circumstances, as indicated in Section 3.2:

Customized basis: Measures where a prescriptive algorithm exists in the TRM but a Program Administrator chooses to use a customized basis in lieu of the partially or fully deemed inputs. These measures reflect more customized, site-specific

calculations (e.g., through a simulation model) to estimate savings, consistent with Section 3.2.

5.2 *Detailed Impact Results: Research Findings*

This appendix presents the methodology and preliminary results of Navigant's ongoing research on furnace consumption and savings. The results here represent only the analysis of participant billing data and will be updated in the spring of 2013 once the metered data is available.

5.2.1 Sample Selection

Navigant selected the sample by starting with billing data of all homes that installed furnaces of 95% AFUE or higher through the Nicor Gas HEER program during Rider 29. The analysis team filtered the database by removing datasets that were duplicates, contained negative billing data, or showed a change of home ownership from 2009 to 2012. This filtered database was then manipulated to reflect the actual gas consumption per month ("monthly consumption data") rather than the billed therms per month ("monthly billed data") based on the billing cycle date. We visually analyzed the remaining datasets to ensure an accurate reflection of gas consumption per month (e.g. datasets were removed if they had very erratic load shapes). After Navigant applied these filtering techniques to the original database, a database of 387 monthly consumption datasets remained to perform our analysis. Navigant used this sample to recruit on-site participants, ensuring that all on-site participants will also be in the billing data analysis.

5.2.2 Disaggregation Methodology

Navigant constructed a disaggregation tool to separate the heating and non-heating portion of the post-installation consumption data using the following steps:

1. Estimate non-heating loads by month using:
    a. Building America inputs (i.e. load shapes and input capacities of non-heating gas appliances)[4]
    b. Installation rates of gas non-heating appliances based on Bass & Company Potential Study[5]
2. Calculate average summer usage for each post-installation year (2010-2012) based on the mean of participants' July and August gas consumption. July and August usage are most representative of non-heating only consumption.
3. Calibrate non-heating loads to the summer average calculated in Step 2. This step essentially scales the load shape profile to typical summer usage.
4. Calculate the percentage of heating versus non-heating gas consumption for the post-installation data for each month. For 2010, which had less post-installation data than other years, Navigant used the mean summer average from 2011 and 2012.

[4] Building America Benchmarking Program Database. U.S. Department of Energy, 2010.
[5] Jacobson, B. and K. Lawless. "Service Territory Baseline and Energy Efficiency Market Potential Study for Nicor Gas Energy Efficiency Program." Bass & Company, 2010.

5. Apply the heating percentages by month to each participant's usage to disaggregate the heating portion of the gas consumption data. This calculation is summarized in the following algorithm:

$$HPF_{i,j} = \frac{\frac{\sum_1^k C_{i,j,k}}{k} - C_{i,j,k} * (C_{non-heating})_{i,j}}{\frac{\sum_1^k C_{i,j,k}}{k}}$$

Table 5-1. Heating Percentage Factor Inputs

Parameter	Description	Units	Source
i	Subscript to specify month (i=1,2,…,12)	–	N/A
j	Subscript to specify year (j=2009,…,2012)	–	N/A
k	Subscript to specify dataset (k=1,2,…,387)	–	Billing data
$HPF_{i,j}$	Heating percentage factor: percentage of gas consumption allocated to heating in month i and year j	%	Calculated
$C_{i,j,k}$	Total heating and non-heating gas consumed in month i, year j, and dataset k	$Therms/month$	Billing data
$(C_{non-heating})_{i,j}$	Average non-heating gas consumption percentage in month i and year j	%	Calculated

5.2.3 Heating Savings Calculation Methodology

After disaggregating the heating portion of the consumption data from the post-installation datasets, Navigant used the following methodology to estimate energy savings:

1. Adjust the heating portion of the post-installation gas consumption data for weather based on the ratio of typical meteorological year (TMY) heating degree-days (HDDs) to actual HDDs. This normalizes the heating consumption to a typical weather year. The algorithm and inputs are as follows:

$$WAF_{i,j} = \frac{(HDD_{TMY})_i}{(HDD_{Actual})_{i,j}}$$

Table 5-2. Weather Adjustment Inputs

Parameter	Description	Units	Source
i	Subscript to specify month (i=1,2,…,12)	–	N/A
j	Subscript to specify year (j=2009,…,2012)	–	N/A
k	Subscript to specify dataset (k=1,2,…,387)	–	Billing data
$WAF_{i,j}$	Weather adjustment factor for month i and year j	%	Calculated
$(HDD_{TMY})_i$	Heating degree days for month i in the typical meteorological year	°F – day	EnergyPlus weather files Location: Chicago O'Hare Airport
$(HDD_{Actual})_{i,j}$	Actual heating degree days for month i in year j, location specific	°F – day	www.degreedays.net Location: Chicago O'Hare Airport

2. Calculate the heating load based on the weather-adjusted post-installation heating gas consumption and the rated AFUE of the installed furnace (95% or greater):

$$L_{i,j,k} = C_{i,j,k} * WAF_{i,j} * HPF_{i,j} * (AFUE_{EE})_k$$

3. Subtract the energy efficient gas consumption from the baseline gas consumption to calculate energy savings, defining the baseline as a replace-on-burnout furnace with an AFUE of 80%:

$$(E_{savings})_{i,j,k} = \frac{L_{i,j,k}}{AFUE_{baseline}} - \frac{L_{i,j,k}}{(AFUE_{EE})_k}$$

Table 5-3. Energy Savings Inputs

Parameter	Description	Units	Source
i	Subscript to specify month (i=1,2,…,12)	–	N/A
j	Subscript to specify year (j=2009,…,2012)	–	N/A
k	Subscript to specify dataset (k=1,2,…,387)	–	Billing data
$L_{i,j,k}$	Weather-adjusted heating load in month i, year j, and dataset k (e.g. household heating need)	$Therms/month$	Calculated
$C_{i,j,k}$	Total heating and non-heating gas consumed in month i, year j, and dataset k	$Therms/month$	Billing data
$WAF_{i,j}$	Weather adjustment factor for month i and year j	%	Calculated
$HPF_{i,j}$	Heating percentage factor: percentage of gas consumption allocated to heating in month i and year j	%	Calculated
$(E_{savings})_{i,j,k}$	Gas savings due to energy efficient furnace installation in month i, year j, and dataset k	$Therms/month$	Calculated
$(AFUE_{EE})_k$	AFUE of energy efficient furnace of dataset k (95% or greater)	%	Manufacturer specifications
$AFUE_{baseline}$	AFUE of baseline furnace (80%)	%	Illinois TRM[6]

5.2.4 Preliminary Results

Table 5-4 summarizes the average savings in each month resulting from the installation of the energy efficient furnace. These results will be adjusted using metered data from up to 39 field sites.[7] We anticipate that metered results may lower savings estimates due to the fact that some homes have more than one furnace, and the current billing data analysis assumes that the entire heat load is served by a single furnace in all homes.

[6] Illinois Technical Reference Manual, Final Technical Version. Effective June 1, 2012.

[7] Sampling plan calls for data from 35 sites; Navigant oversampled to anticipate logger failure and installed loggers at 39 homes.

Table 5-4. Preliminary Average Annual Heating Load and Savings

	Annual Heat Load (therms)	Annual Savings (therms)
Mean	854	170
Standard Deviation	345	69
Coefficient of Variation (cv)	0.40	0.41
Number of Units (N)	387	387
Relative Precision (at 90% confidence)	3.4%	3.4%

Navigant also normalized these results to the heating capacity of the units installed. For dual-stage units, Navigant assumed that units operate in their "low" stage 75% of the time and in their "high" stage 25% of the time.

Table 5-5. Preliminary Results by Heating Capacity of Furnace

	Heating Capacity, Btu	Annual Heat Load per kBtu	Annual Savings per kBtu
Mean	83,385	10.6	2.1
Standard Deviation	17,248	5.1	1.0
Coefficient of Variation (cv)	0.21	0.48	0.48
Number of Units (N)	387	387	387
Relative Precision (at 90% confidence)	1.7%	4.0%	4.0%

5.2.5 Non-heating End Use Savings Calculations

Navigant used the following inputs and calculations to determine billing data disaggregation and gas savings:

Water Heater Gas Consumption:

$$(C_{Water\ Heater})_i = \left(DC_{UA} + (DC_{Heating})_i\right) * n_i * MS_{water\ heater}$$

$$DC_{UA} = \frac{(T_{tank} - T_{ambient}) * UA_{tank} * 24\ hrs/day}{\eta_{heating\ element} * 100{,}000\ btu/therm}$$

$$(DC_{Heating})_i = \frac{DHW * \frac{Occ_{Nicor}}{Occ_{BA}} * 8.33 * (T_{tank} - (T_{mains})_i)}{\eta_{heating\ element} * 100{,}000\ btu/therm}$$

Table 5-6. Water Heater Consumption Inputs

Parameter	Description	Units	Source
i	Subscript to specify month (i=1,2,…,12)	–	N/A
$(C_{Water\ Heater})_i$	Gas consumption of water heater in month i	$therms/month$	Calculated
DC_{UA}	Daily gas consumption due to heat loss through tank walls	$therms/day$	Calculated
$(DC_{Heating})_i$	Daily gas consumption due to heating water from the water mains in month i	$therms/day$	Calculated
n_i	Number of days in month i	$days/month$	N/A
$MS_{water\ heater}$	Market share of gas [versus electric] water heaters (94% of single family homes in the Nicor Gas territory have a gas water heater)	%	Bass & Company Potential Study[8]
T_{tank}	Temperature set-point of water tank (assumed 125 ˚F)	°F	Illinois TRM[9]
$T_{ambient}$	Temperature of ambient air near water tank (assumed 70 ˚F)	°F	Assumed
$(T_{mains})_i$	Location-specific temperature of water mains in month i	°F	Building America Benchmark[10]
UA_{tank}	Thermal transmittance through the tank walls	$\frac{btu}{hr - °F}$	Building America Benchmark
$\eta_{heating\ element}$	Efficiency of the heating element in the water heater (Assumed 76%)	%	Building America Benchmark
DHW_i	Daily hot water demand in month i	Gal/day	Building America Benchmark
Occ_{Nicor}	Average household occupancy in the Nicor Gas service territory (2.6)	$Persons/household$	Bass & Company Potential Study
Occ_{BA}	Average household occupancy determined by Building America (2.8)	$Persons/household$	Building America Benchmark
8.33	Heat capacity of water	$\frac{btu}{Gal - °F}$	Constant

[8] Jacobson, B. and K. Lawless. "Service Territory Baseline and Energy Efficiency Market Potential Study for Nicor Gas Energy Efficiency Program." Bass & Company, 2010.
[9] Illinois Technical Reference Manual, Final Technical Version. Effective June 1, 2012.
[10] Building America Benchmarking Program Database. U.S. Department of Energy, 2010.

Table 5-7. Gas Water Heater Load Shape

Month	Gas Water Heater Load Shape[a]
January	1.167
February	1.072
March	1.165
April	1.070
May	1.024
June	0.912
July	0.868
August	0.868
September	0.847
October	0.932
November	0.980
December	1.095

[a] *Load shape calculated from algorithm presented above.*

Clothes Dryer and Stove/Oven Consumption:
Navigant used the following load shapes from the Building America Benchmarking database to characterize gas consumption from clothes dryers and cooking.

Table 5-8. Gas Appliance Load Shapes

Month	Gas Clothes Dryer Load Shape[a]	Gas Stove/Oven Load Shape[a]
January	1.151	1.097
February	1.144	1.097
March	1.010	0.991
April	1.007	0.987
May	1.010	0.991
June	0.874	0.890
July	0.881	0.896
August	0.881	0.896
September	0.874	0.890
October	1.010	1.085
November	1.007	1.085
December	1.151	1.097

[a] *Load shapes from Building America Benchmark*

5.3 *Detailed NTG Calculations*

Participant Free Ridership

In order to calculate participant free ridership using data obtained from the participant interviews, the program participants were asked the likelihood that they would have purchased the high efficiency equipment had the program been unavailable, and the importance of either the program on their decision.

If the customer did not have specific plans to install the program measure prior to participation, the qualifying measure was considered "early replacement", and free ridership is estimated to be zero.

If the installation was not an early replacement, then

$$FR = \frac{LIKELIHOOD * (1/3) + IMPORTANCE * (2/3)}{10}$$

Else,

$$FR = \frac{\frac{(LIKELIHOOD + TIMING)}{2} * (1/3) + (1 - IMPORTANCE) * (2/3)}{10}$$

Trade Ally Perspective of Participant Free Ridership

To calculate participant free ridership using data obtained from the trade ally interviews, the trade allies were asked the likelihood that they would have sold the same volume of high efficiency equipment had the program been unavailable, and the importance of the program incentive and the program educational and marketing materials on the participants' decision to select equipment with higher levels of efficiency.

$$FR = \frac{LIKELIHOOD * (1/3) + [1 - MAX\ INFLUENCE(Program\ Incentive, Program\ Materials)] * (2/3)}{10}$$

Trade Ally Spill over

To calculate participant free ridership using data obtained from the trade ally interviews, the trade allies were asked to estimate approximately what percentage of qualifying equipment was purchased by non-program participants, and the influence their own recommendations and the program materials had on their customers' decisions to purchase high efficiency equipment.

$$SO = \%NonPart\ HE\ Purch * MAX\ INFLUENCE(TA\ Recommendation, Program\ Materials)$$

5.4 Detailed Process Results

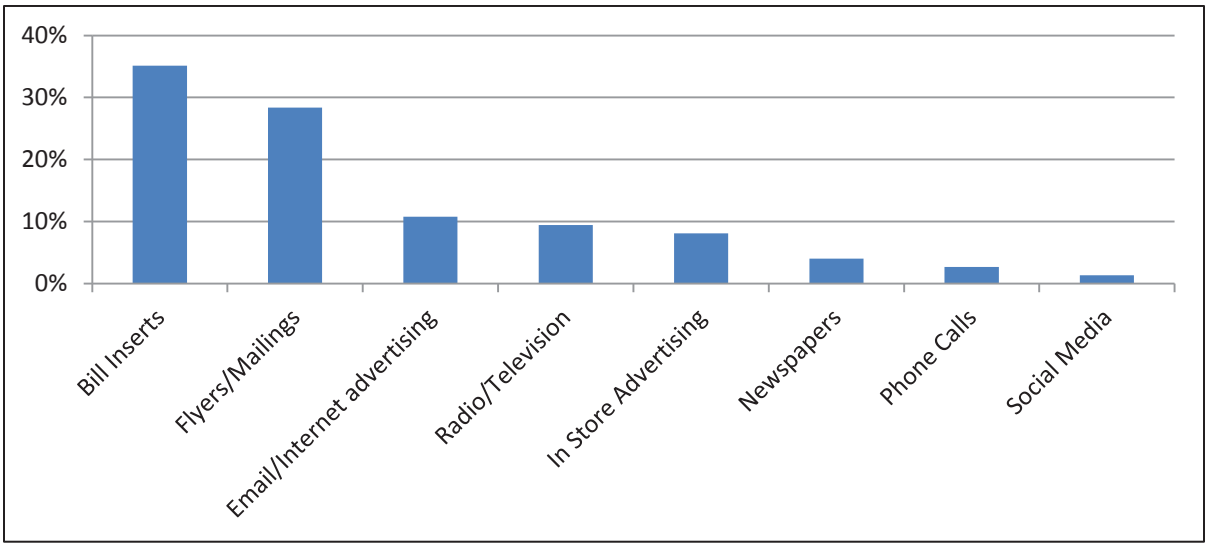
5.4.1 Participant Survey Results

Marketing and Participation

When asked how they first heard about the Nicor Gas Home Energy Efficiency Rebate program, a majority (56%) of the participants stated that they first heard of the program through their contractor. The next most common methods that participants first heard of the program were Nicor Gas Bill Inserts (14%) and the Internet, including the Nicor Gas website.

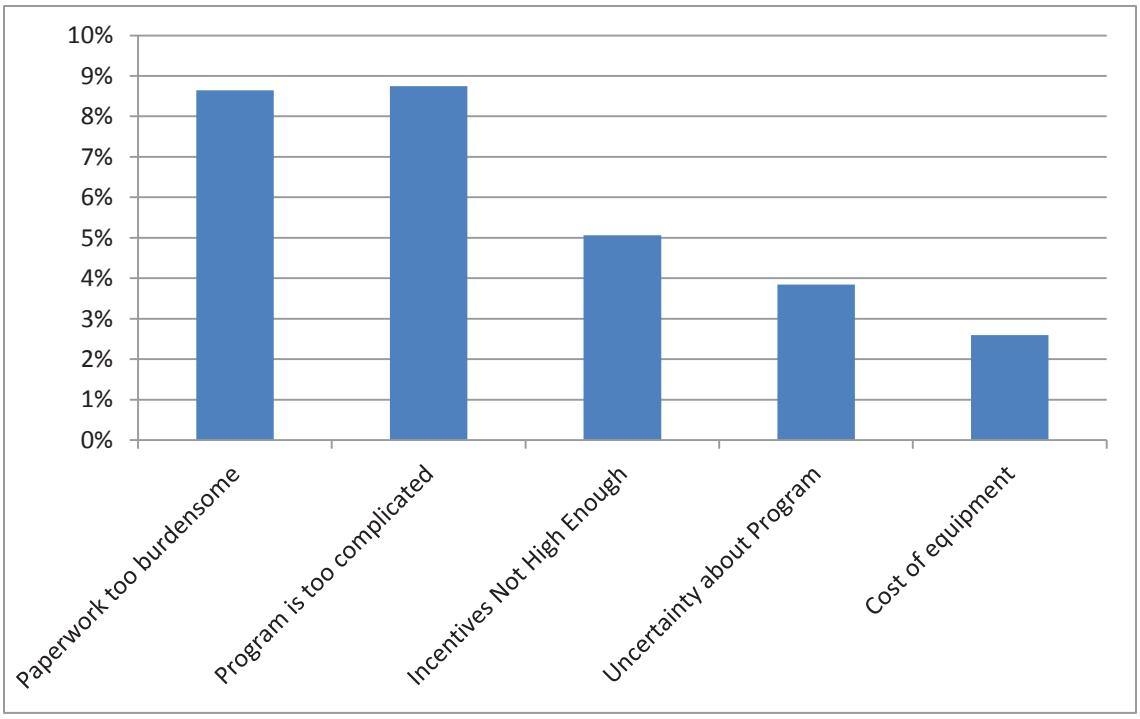
The survey respondents were asked what methods they thought Nicor Gas could employ to reach out to customers to encourage them to participate in the program. The most commonly cited method was bill inserts, with 35% of respondents mentioning it, followed by direct mailing, and email or internet advertising. All of the suggested methods are presented in Figure 5-1. Please note that some methods of survey participants mentioned multiple methods of communication.

Figure 5-1. Suggested Methods of Customer Outreach



When asked about any potential barriers that customers may face that would prevent customers from participating in the program in the future, most of the respondents could not cite any specific potential barriers. However, among those who did, the most commonly cited potential barriers were that the paperwork may be too burdensome, and that the program is too complicated. Also mentioned were that the incentives may not be high enough. Several respondents mentioned that there was some uncertainty about what high efficiency units are eligible for incentives through the program. This suggests that there is some room for improvement in both educating the participating trade allies to ensure that they can explain the program to potential participants, and that there may be an opportunity for Nicor Gas to provide additional literature to help customers understand which high efficiency measures are eligible for the program.

Figure 5-2. Potential Barriers to Participation

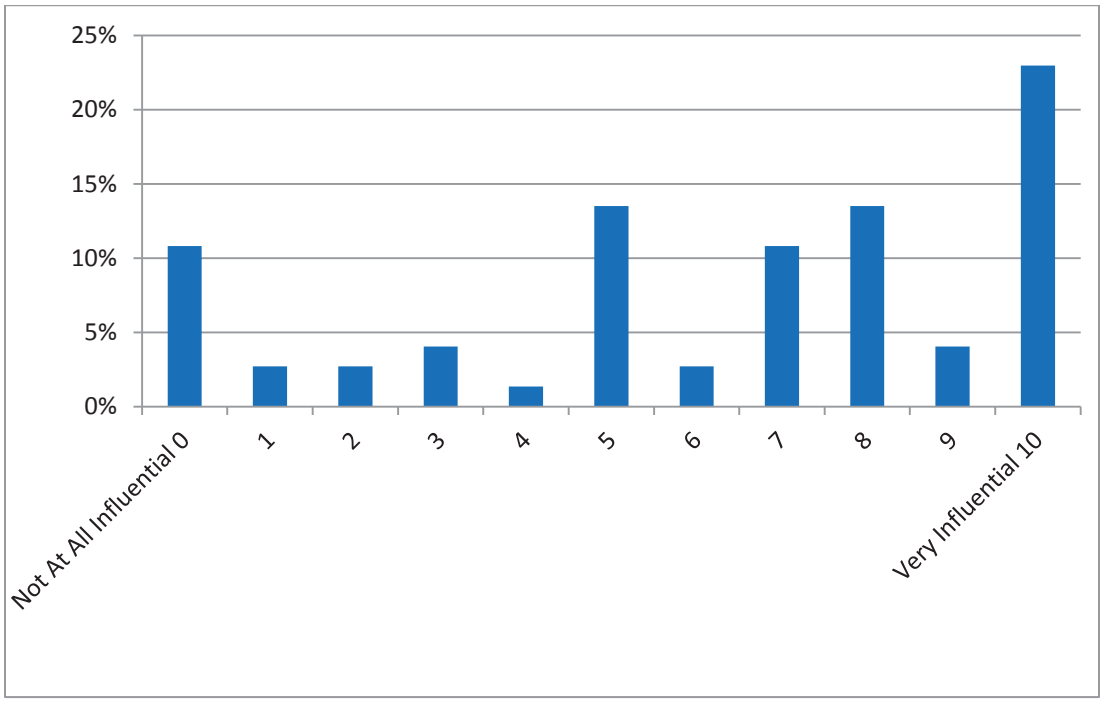


Program participants were also asked about their reasons for participating in the program. Survey respondents were asked if they strongly agreed, agreed, disagreed, or strongly disagreed that a potential reason to participate influenced their decision to participate in the program. The most highly agreed with reason for participation was to lower energy bills. Over half (53%) of respondents strongly agreed that lowering energy bills was the primary reason for them to participate in the program, and an additional 41% of respondents agreed that it was a reason for their participation.

Trade Ally Influence

The program participants were asked about how influential their trade ally was on their decision to participate in the program. When rated on a scale from zero to ten, where zero is rated "not at all influential" and ten is rated "very influential", the average score given was a 6.3. However, when the distribution of ranking in analyzed, it is revealed that a vast majority (68%) of participants rated the influence of the trade ally at a 5 or greater. Furthermore, nearly a quarter of participants ranked the influence of their trade ally at "highly influential", with a rating of ten. Slightly over one in ten participants reported that the trade ally had no influence on their decision to participate at all, and rated the influence of the trade ally at zero. This suggests that while there are a number of participants who decided to participate on their own, the trade allies are highly instrumental in spurring participation, and the adoption of higher efficiency measures in their customers. Figure 3-3 presents the distribution of the rating.

Figure 5-3. Influence of Trade Ally on Decision to Participate



Program Satisfaction

Table 5-9 presents the results of the participant survey on their satisfaction with the program sub-processes. As before, participants were asked to rate their level of satisfaction on a zero to ten scale, where zero meant "not all at satisfied" and ten meant "very satisfied". As can be seen, the areas that receive the highest levels of satisfaction were the quality of work completed by the contractor and the performance of the measure installed. This suggests that the contractors who are opting to participate in the program are of high quality, and perform high quality work, and that they are promoting and selling high quality equipment to their customers. The lowest rated portions of the program were the application process and the length of time before customers received their rebate. Nicor Gas should consider increasing the use of the "instant" rebate, which allows certain participating trade allies to provide discounts on to customers on their costs at the time of purchase. By increasing the number of trade allies who are able to offer this option to their customers, this level of satisfaction will increase. Both the Nicor Gas and the ComEd phone staff received high levels of satisfaction among those participants who had experience interacting with them.

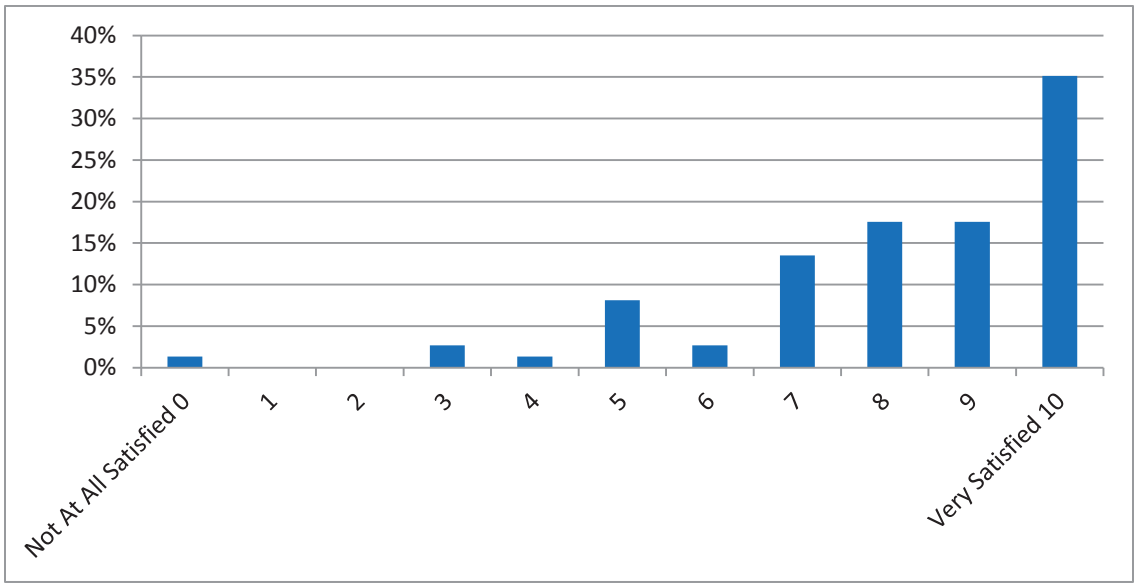
Table 5-9. Satisfaction with Program Sub-Process

	Mean Score	Median Score	Percent of Responses Greater than 7	Percent of Responses Less than 4	n
Program Information Received Before Participation	7.6	8	63%	8%	63
The Application Process	7.1	8	57%	12%	67
The Phone Staff at Nicor Gas	8.1	9	71%	6%	48
The Phone Staff at ComEd	7.9	10	75%	25%	8
The Program Website	7.4	8	64%	5%	39
The Rebate Deliver Speed	7.0	8	52%	14%	69
The Quality of Work by the Contractor	9.3	10	91%	0%	74
The Performance of the Installed Measure	9.3	10	91%	0%	74

Satisfaction with the ComEd Phone Staff was only asked of Complete System Replacement participants.

Program participants were asked about their overall satisfaction with the program, on a scale from zero to ten, where zero means "not at all satisfied" and ten means "very satisfied". The average overall satisfaction score was an 8.1. The vast majority (70%) of program participants rated their satisfaction with the program at greater than seven. Only one participant rated their overall satisfaction at a zero, and when asked what their reasons were, replied that they were uncertain of whether or not their rebate had been accepted until they contacted Nicor Gas for confirmation. When other low-ranking participants were asked the reasons for their level of satisfaction, the most commonly cited reasons were confusion about the application process, including which measure were eligible for incentives, and the perceived burdensome nature of the application process in general.

Figure 5-4. Overall Satisfaction with the Program Experience



When asked if there was anything that the program did particularly well, many of the participants expressed that they were generally pleased with the program, and several mentioned that they were happy to have received a rebate from the program, especially because furnaces and boilers tend to be "large ticket" items to purchase. When asked what could be done to improve the program, the most commonly cited suggestion was in simplify the application process, followed by increasing the rebate amount. Also suggested was providing program information in Spanish and expanding the measure offered.

Slightly less than half (47%) of surveys participants reported that they had recommended the Home EER program to people outside of their household. When asked how many people they had recommended the program to, the average response was five people outside of their household. The most commonly cited number of people they had recommended the program to was three. Two-thirds of respondents stated that they had recommended the program to three or fewer people, and 20% stated that they had recommended the program to more than five people. When those who had not already recommended the program to others outside their household were asked if they would recommend it, 90% of respondents replied in the affirmative. When asked why they would not recommend the program, the most cited reason was the perceived difficulties with participation.

5.4.2 Trade Ally Survey Results

Marketing and Participation

When asked how they their customers, approximately half of the trade allies explained the rebate to the customer at the time of purchase, and the others relied up printed materials

that they either received directly from Nicor Gas or printed from the Nicor Gas website. A couple of trade allies mentioned that many of their customers had heard of the program before they mentioned it, through Nicor Gas promotional efforts, such as radio advertisements and bill inserts.

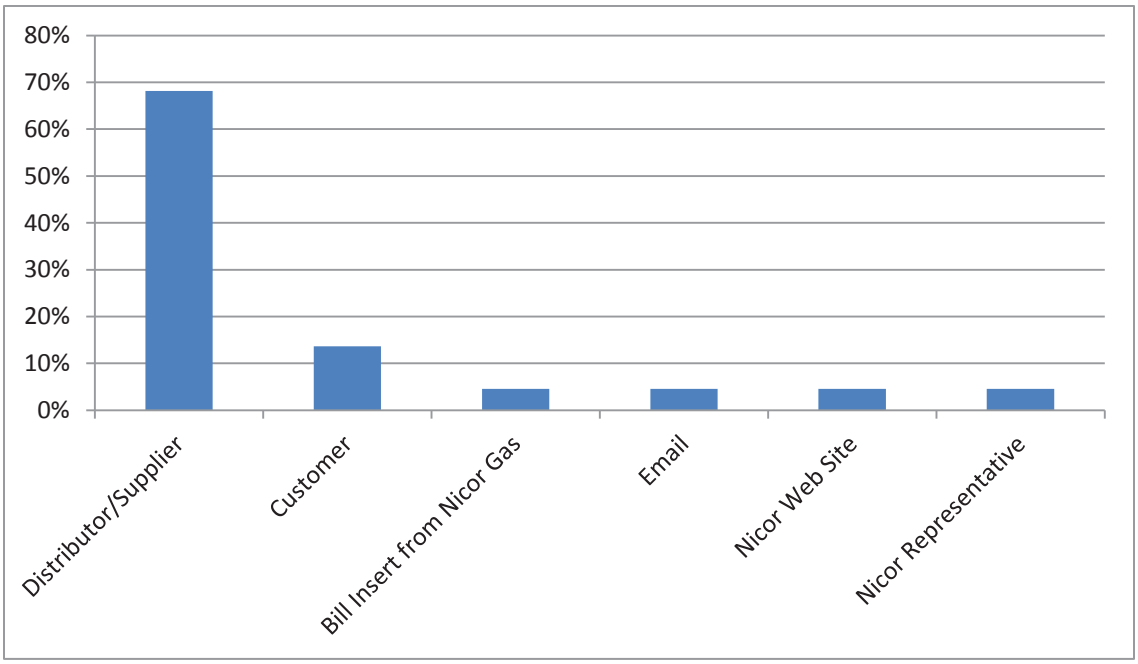
Slightly over three quarters (78%) of the trade allies surveyed actively market the program as a way to increase their level of customer service, and indicated that most of their customers were already aware that Nicor Gas offers rebate programs, but were unsure of the details of the program and the requirements for participation.

When asked how effectively Nicor Gas promoted the program to its residential customers, on a scale from zero to 10, where zero stands for "not promoted" and ten means "very well promoted", the average rating given was 6.6. However, 43% of respondents rated Nicor Gas' promotion efforts at greater than seven. When those who did not feel that the program was being adequately advertised were asked what Nicor Gas could do to better promote the program, the most common response was to increase advertising, such as television, radio, and newspaper advertising.

The trade allies surveyed were asked what the most significant barrier to participation their customers experienced was. The most commonly given answer, cited by six trade allies, was the additional cost associated with more efficient units. The next most common answer was a lack of awareness of the program and its associated incentives, which was mentioned by four trade allies. Also mentioned were a lack of awareness of the benefits of installing higher efficiency measures, and confusion with the application process.

When trade allies were asked how they themselves became aware of the program, over two-thirds (68%) mentioned that they first heard of the program through their equipment distributor or supplier, making that the most common response. Next most common response was that a customer first informed the trade ally about the program, with 14% of responses.

Figure 5-5. Method of Trade Ally Program Awareness



Program Satisfaction

The trade allies were asked both about their own levels of satisfaction with the Home EER program, and their customers' perceived levels of satisfaction with the program. Trade allies were asked to rate their own levels of satisfaction with the program on a scale from zero to ten, where zero is "not at all satisfied" and ten is "very satisfied". The average satisfaction score given was an eight, and 70% of trade allies reported having satisfaction levels of higher than 7. The distribution of trade ally satisfaction is presented in Figure 5-6. When those trade allies with satisfaction scores of less than 5 were asked what their reasons were, the all answered that the program application paperwork and process was too complicated, both for themselves and for their customers.

Figure 5-6. Overall Trade Ally Satisfaction with the Program Experience

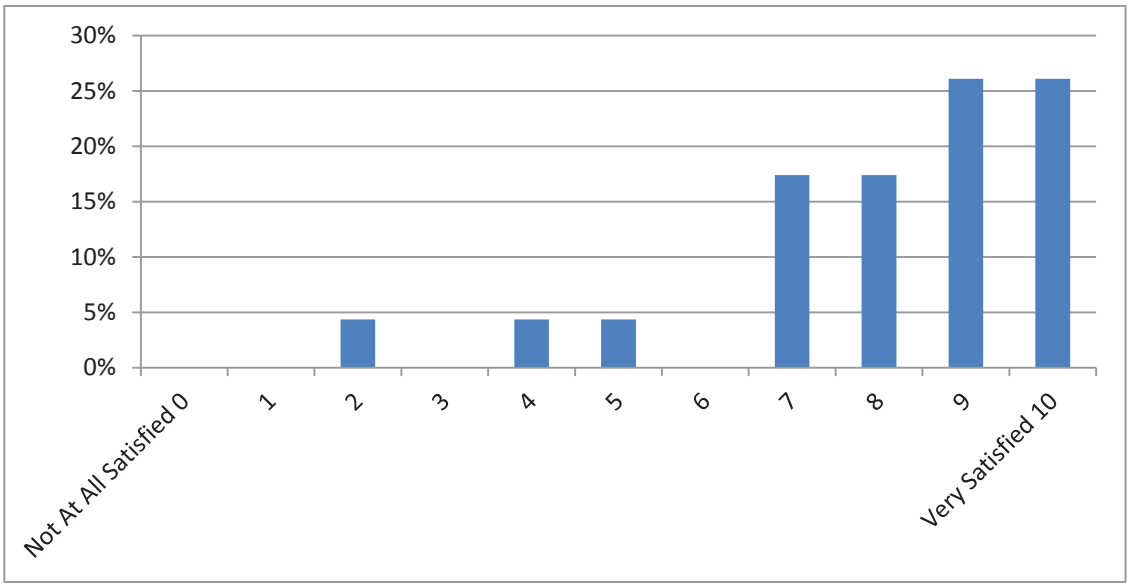


Table 5-10 presents the trade ally satisfaction with the program sub-processes. The trade allies were once again asked to rate their satisfaction on a zero to ten scale, where zero is "not at all satisfied" and ten is "very satisfied". As can be seen, the area with the lowest level of satisfaction was the application form and process. Many trade allies expressed that they felt both were too complicated.

Table 5-10. Trade Ally Satisfaction with Program Sub-Process

	Mean Score	Median Score	Percent of Responses Greater than 7	Percent of Responses Less than 4	n
Promotional Materials and Marketing Efforts by Nicor Gas	7.4	8	65%	10%	20
Application Form and Process	6.8	7	43%	9%	23
Brands and Models of Equipment Covered by Program	9.3	10	90%	0%	20
Technical and Customer Assistance Provided by Nicor Gas	7.8	9	71%	12%	17
Speed of Getting Rebate (Instant Rebate Participating Trade Allies)	7.7	8	60%	7%	15
Rebate and Incentive Levels	8.3	9	68%	0%	22

When the trade allies were asked about the levels of satisfaction that they perceive in their customers, on a scale from zero to ten, where zero is “not at all satisfied” and ten is “very satisfied”, the average perceived level of participant satisfaction was an eight, and 60% of trade allies reported that the level of satisfaction they perceiving in their customers was greater than seven. When asked what could be done to increase the participant satisfaction, the most commonly given answer was to simplify the application process, followed by increasing program awareness, and expanding the measures included in the program.

5.5 *Verification, Due Diligence and Tracking System Review*

To: **Scott Dimetrosky**

Copy: **Jim Jerozal, Dan Rourke, Jennifer Hinman, David Brightwell, Ted Weaver**

From: **Katherine Wolf and Julianne Meurice, Navigant**

Date: **July 20, 2012**

Re: Verification, Due Diligence and Tracking System Review of the Nicor Gas Home Energy Efficiency Rebate Program

Introduction

This document reports on Navigant's verification and due diligence review of quality assurance, program tracking, and eligibility verification procedures used in the Nicor Gas Home Energy Efficiency Rebate (HEER) program under Rider 30 during program year one (PY1). Navigant will provide a separate engineering review of the deemed savings used in calculating total program savings, as well as a process evaluation, in the final report. The Verification and Due Diligence recommendations reported below are based on findings from the in-depth interviews with the program staff and review of program documentation including process flow diagrams, summary statistics on process flow, and tracking system databases.

Overview of Findings

Overall, verification and quality assurance procedures for Nicor Gas' Residential Rebate program (PY1) present a reasonably detailed framework approaching nationally-recognized best practice standards.

Navigant has reviewed Nicor Gas' program tracking system and found that it gathers nearly all the critical data required to support future evaluations. Nicor Gas' PY1 activities meet most of the industry "best practices" as defined by the *National Energy Efficiency Best Practices Study,* a document judged acceptable by the California Public Utilities Commission in 2008 for EM&V review. Overall, the quality assurance and verification procedures in place for the Home Energy Efficiency Rebate Program provide a detailed quality control framework that meets many aspects of national best practices.[11] However, additional work is needed on aspects of tracking system management and for quality control and verification, as described below. In the future as the program changes to include measures installed in new construction, data has been be included as to the characterization of individual projects as either "replace on burnout" measure (one that's installed at the end of the old equipment's lifetime) or new construction measures. This has been accomplished by

[11] See normative details and scoring code in the Best Practices Self-Benchmarking Tool developed for the Energy Efficiency Best Practices Project: *http://www.eebestpractices.com/benchmarking.asp*

including a box on the application to be marked when the building is new construction. Measures that are included in the Complete System Replacement (CSR) joint Nicor Gas/ComEd effort could possibly be considered early replacement measures if the furnace still had remaining useful life but was replaced at the end of the AC unit's lifecycle. During PY1, information about the replaced equipment was only recorded for the AC portion of the CSR measures; however, for PY2 and PY3, this information will be included on the application for the furnaces as well. This will allow for better classification of the furnaces installed under the CSR and determine whether there is cause for collecting early replacement savings during PY2 and PY3.

Purpose of the Verification and Due Diligence Review

The purpose of the verification and due diligence review is to determine:

- Whether appropriate eligibility criteria have been properly adhered to and applications are appropriately completed and backed with supporting documentation;
- Whether savings were calculated correctly and project information entered in an accurate and timely manner in the tracking system;
- Whether key quality assurance and verification activities were adequately implemented; and
- Whether all the data needed for evaluation is included in the program tracking system.

Data Collection

To accomplish the stated objectives, the Navigant Evaluation, Measurement and Verification (EM&V) team initiated a data collection and telephone interview process. Navigant conducted in-depth interviews of key implementation staff members. In addition, the team requested and reviewed program documentation, such as program manuals, application forms, and a Microsoft Excel spreadsheet extracted from the program tracking system. Finally, the team requested and received copies of the application documents for five boiler applications, five water heater applications and twenty furnace applications.

In-depth Interviews with Program Stakeholders

The EM&V team then conducted in-depth telephone interviews separately with the program administrator and implementation staff. The telephone interviews included prepared question topics that would also serve the impact evaluation, such as program administration, program outreach and marketing, program delivery mechanism, customer satisfaction, and implementation challenges.

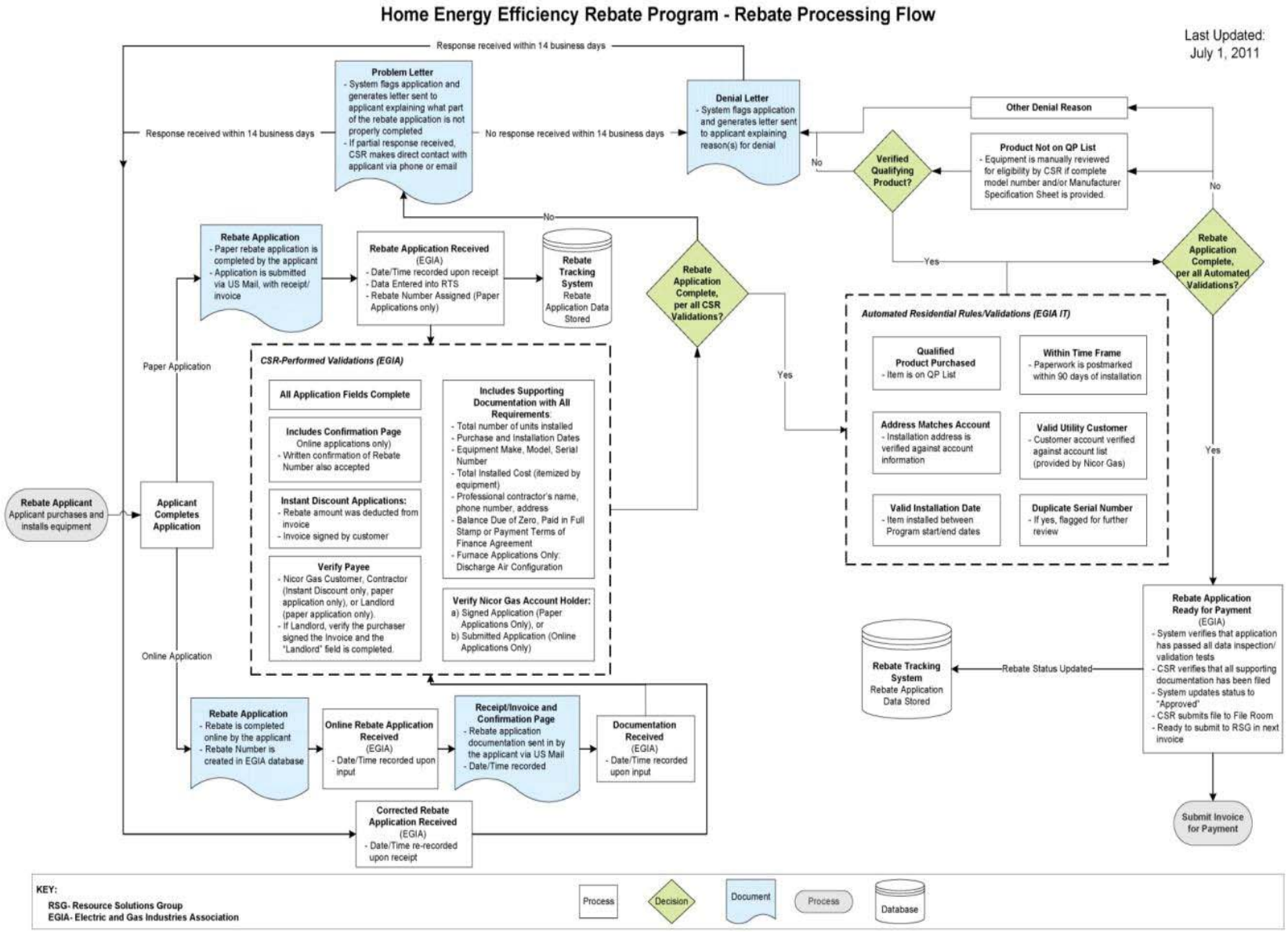
Review of Program Process Due Diligence

Navigant examined the operating procedures for gathering tracking system data used by the Wisconsin Energy Conservation Corporation (WECC), the program administrator, Resource Solutions Group (RSG), Inc., the program implementer, and Electric and Gas Industries Association (EGIA), the fulfillment and call center, to process Residential Rebate applications. The program administrator and the implementer have not changed from the pilot program under Rider 29; however, the site inspection subcontractor (Milhouse Engineering and Construction) was brought into the program new for PY1.

The detailed procedure is illustrated in by a flow diagram (Figure 5-7) detailing the following steps:

- Pre-Installation and Installation
- Application submission on-line or on paper
- Application review
- Incentive payment
- Post-inspection

Figure 5-7. HEER Rebate Processing Flow



The Home Energy Efficiency Rebate program relies on trade allies as the primary source of program promotion. Thus the pre-installation component of the program consists of participating trade allies making customers aware of the rebate price discounts available to them on eligible efficiency measures if they decide to purchase them. The rebate allows the trade allies to "up-sell efficiency."

It is the responsibility of the trade ally to determine whether the customers and measures they promote and install on behalf of the program are eligible for rebates according to the program's stipulations. Customers, or trade allies on behalf of customers, have ninety days after the installation of eligible measures to submit (by posted mail or email) a customer-signed application and accompanying verification material to the program implementer.

Upon receiving an application, RSG and EGIA follow the QA/QC and database registration procedures outlined in the program's operations manual. Initial QA/QC includes verifying the rebate application is complete with all the required eligibility information and documentation and that the installed equipment is included on the Qualified Product List. If documentation is missing, a follow-up communication is arranged with the customer or trade ally. The program administrator confirmed that based on previous EM&V suggestions, the method of communications has changed in order to expedite the application process (i.e., instead of sending a letter, the implementation team calls the participant), increasing the efficiency of the application process.

According to the operations manual, one of the Key Performance Indicators (KPI) for the application review process is that checks are to be issued within 14 days of receipt of a completed application. According to the administrative manager, overall the goal was met, but some applications submitted on-line did not meet the goal, and averaged 15 days between receipt of the application and the issuing of a check. This was counter balanced by the fact that the applications received by mail averaged 13 days between receipt of the application and the issuing of a check.

Post-Installation

Approximately 6% of sites are randomly selected for inspection for each measure type with a goal of completing inspections at 3% of sites (i.e., based on the initial verification of the CSR measures conducted in June, WECC found a 55% response/consent rate to the verification request; therefore, a 6% sample is needed to meet the 3% goal). WECC subcontracted with Milhouse Engineering and Construction in June to complete the on-site verifications. Inspections include measure installation verification, a visual safety inspection and, where necessary, a combustion safety inspection. Figure 5-8 presents the data collection form used in the site verification visits. 43 sites visits were complete but results of said inspections were not available at the time of this memo; all will be included in the final report. Navigant recommends tracking inspection findings in the tracking database and establishing procedures for dealing with inspections where problems are identified. This should include a procedure for talking to the contractor when a problem is found. Also, the

findings and resolutions of issues should be documented, and a formal documenting procedure should be developed.

Figure 5-8. Data Collection Form Used in Site Verification

nicor GAS
Energy Efficiency Program
USING ENERGY WISELY FOR A BETTER FUTURE™

Nicor Measure Verification Program

General Information

Owner Name:
Street Address:
City:
State:
ZIP:
Home # :
Work # :

Verified?	Air Conditioner Measure Information (if applicable)
	Measure:
	Quantity:
	Outdoor Unit Brand:
	Outdoor Unit Model # :
	Outdoor Unit Serial # :
	Indoor Unit Brand/Mfr:
	Indoor Unit Model # :
	Indoor Unit Serial # :
	Contractor Name:

Verified?	Measure Information
	Measure:
	Quantity:
	Mfr/Brand:
	Model # :
	Serial # :
	Contractor Name:

Equip't Inspection Information

Inspected By:
Date Inspected:
Equipment Type:
Model# and Serial # match incentive?
If #s do not match, record Model# present:
If #s do not match, record Serial# present:
Common Vent?
Direct Vent?
Flue Closed?

Residential or Commercial Space?

Has the hot water vent been upgraded if the furnace vent has been removed?
How is condensate disposed of?
If other, describe:

Furnaces & Boilers

Building Type:		*Other?*	
Year Built:		Building Floor Area:	sq. ft.
Daytime Temp:	ºF	Programmable Tstat:	
Use Setback?		*If yes, to what temp?*	ºF
		and from when to when?	to

Water Heaters

Number of People:			
Dishwasher?		How many bathrooms?	

How did you hear about the program?

Comments:

Sample

Customer Service

While there is an established procedure for handling customer complaints about the program and/or the rebate procedure, there does not appear to be an established protocol for handling customer complaints and disputes with the trade allies. Although according to the implementation staff there have not been any instances of customers attempting to file a formal complaint against one of the participating trade allies, Navigant suggests that a more formal procedure be established in the event that one may be needed. Even though the program does not become involved with issues regarding quality of work or customer service, having a formal procedure to follow in response to a complaint may help to maintain customer goodwill towards the program and Nicor Gas.

Tracking System Review Findings

Data collection processes were examined at the record level and records summary level. Navigant reviewed data collection plans, process flow statistics, related documentation, and field verification summary reports. We also reviewed the database developed by WECC and RSG and found tracking information for the following information on each incentive transaction:

- Customer data (i.e., name, address, telephone, e-mail)
- Installation data (i.e., address, date, contactor)
- Measure information (i.e., quantity, model, serial number, efficiency)
- Transaction data (i.e., invoice tracking number, measure cost, purchase date)
- Contractor info (i.e. firm name, phone number)

The evaluation team found that the program database structure is very robust and generally captures the requisite information necessary to accurately and completely track the program's actions. While there is no information on the age of the equipment being removed, because the program assumes "replace on burnout", where the new measure is installed at the end of the old equipment's lifetime, this information is not specifically needed for PY1. However, since this information is being collected for the CSR measures in PY2 for the purpose of exploring early replacement savings, it should be included for this measure moving forward. The program is opposed to considering this information required if implemented for all furnace and boiler units, as the ally network has resisted the burden of collecting this information, and the program would also be burdened with tracking down the old equipment's efficiency specifications. However, when the furnace standards are modified in 2013[12], it may become necessary to alter the program design to focus more on retrofitting furnace measures instead of replacing them on burnout, in which case it will be necessary to include the replaced system age and other data. The new baseline included in the TRM will likely be higher efficiency than the replaced unit, and if the program wants to

[12] Since the VDDTS memo was publishes, the furnace standards change has been postponed, and will not go into effect in 2013.

claim additional savings above the baseline the replaced unit information will be necessary. Navigant suggests that the program begin attempting to collect this information before the new standards take effect, while not rejecting applications that do not include it, to allow the trade allies time to become accustomed to including it. Also, since the program will be modified in PY2 to included measures that are installed in new construction, additional data fields are suggested, in order to differentiate the replacement measures from the new construction measures.

As part of the due diligence review, Navigant requested and reviewed twenty furnace applications, five boiler applications, and five water heater applications. During the review, several discrepancies between the information included on the application and in the tracking database became apparent. For many of the applications reviewed, there was contact information that was included on the application that was missing from the tracking system. Of the 30 sample applications that were reviewed, 23 had no customer contact phone numbers included in the tracking database, despite the fact that this information was included on the application form. Of the 13,035 applicants in the database, 11,222 have no customer contact phone numbers, and 10,103 have no applicant contact information (phone number or email address). Also missing from the tracking database, but included on the actual application form were: contractor phone numbers and email addresses, application contact email addresses, and in one case, the measure installed price. The installed measure information was entered accurately, with the measure make, model, serial numbers and installed efficiency being consistent with the application information.

The tracking system also contained some inconsistency in the contractor information fields, specifically the contractor name and contractor address. A contractor's name may be entered with several different variations, such as: the use of an ampersand or the use of the word "and", including or excluding "Inc.", and the inconsistent use of abbreviations.

The evaluation team did find that many of the measures had $1.00 listed as the measure install price. As that is not a reasonable measure price, it appears that $1.00 is being used as a place holder in instances of missing data. It is Navigant's suggestion that either a non-numeric placeholder be used, or that the field be left blank. This would ensure that calculations done using the data will not include the placeholder, and that, for example, average measure installed prices will not appear artificially low. Based on the tracking database that Navigant received at the time of this memo, there also appear to be a number of fields in the tracking spreadsheet that are not used by the program, and it is Navigant's suggestion that unused fields be eliminated to reduce the possibility of confusion about missing data. If it is not possible to remove the unnecessary fields, since the tracking system is designed to be used by other programs, Navigant suggests that the fields not needed for this specific program be designated as such, to alleviate confusion.

Benchmarking

To conduct the best practices benchmarking assessment, we compared the Home Energy Efficiency Rebate Program practices (shown in bullet form) with the "Cross-Program Best Practices" portion of the *Best Practice Self-Benchmarking Tool* from the *National Energy Efficiency Best Practice Study*[13], which are the numbered items in italic font below.

Reporting and Tracking

In order to evaluate the reporting and tracking procedures of Nicor Gas' Home Energy Efficiency Rebate Program, Navigant compared their methods to the best practices in the "Reporting and Tracking" section of the Self-Benchmarking Tool. Table 5-11 summarizes the scores as determined by the Self-Benchmarking Tool criteria in the "Reporting and Tracking" section.

Table 5-11. Quality Control and Verification Benchmarking Scores

ID	Best Practice	Score*
1	Build in rigorous quality control screens for data entry.	Needs some improvement
2	Carefully document the tracking system and provide manuals for all users.	Needs some improvement

*Scores are on a scale of 0-2 (two being best), based on the metric definitions contained in the tool.

1. *Build in rigorous quality control screens for data entry.*
   - Needs some improvement.
   - After the review of sample applications, it became apparent that for a majority of the participants reviewed, information was not being included despite being present on the application. This included, but was not limited to, customer and contractor phone numbers. Also, Navigant recommends that either characters or, preferably, blank fields be used in instances of missing values (e.g., rather than have measure cost of $1 show it as missing).

2. *Carefully document the tracking system and provide manuals for all users.*
   - Needs some improvement.
   - Flow diagrams and access to the tracking system were provided, but best practice calls for a manual to be prepared describing the tracking system which includes a data dictionary.

Quality Control and Verification

Table 5-12 summarizes the scores as determined by the benchmarking criteria, and the bulleted list below provides additional descriptions of the chosen rating.

[13] "Best Practices for Energy Efficiency Programs" benchmarking tool is available at: http://www.eebestpractices.com/benchmarking.asp

Table 5-12. Reporting and Tracking Benchmarking Scores

ID	Best Practice	Score*
1	Develop inspection and verification procedures during the program design phase.	Meets best practice
2	Provide quick and timely feedback to applicants.	Exceeds Best Practices
3	Build in statistical features to the sampling protocol to allow reduction in required inspections based on observed performance and demonstrated quality work	Meets best practice
* Scores are based on the metric definitions contained in the tool.		

1. *Develop inspection and verification procedures during the program design phase.*
   - Meets best practices.
   - Navigant recommends that inspection and verification results be included in the tracking database.

2. *Provide quick and timely feedback to applicants.*
   - Exceeds best practices.
   - Customers and trade allies can check the status of rebate applications through the Nicor Gas rebates web portal and through EGIA's call center. Nicor Gas' Contractor Circle's "instant discount" provides feedback to applicants through the immediate approval at time of purchase. This exceeds Best Practice standards, which call for feedback to customers on application status within five days of a query.

3. *Build in statistical features to the sampling protocol to allow reduction in required inspections based on observed performance and demonstrated quality work*
   - Meets best practices.
   - Sampling for site verification inspections is currently a random sample of measures installed, which was the sampling approach recommended by Navigant during the Rider 29 evaluation, in order to eliminate the possibility of conscious or unconscious bias in site selection for verification. Navigant also suggests as part of this review that, if there are irregularities or other cause for suspicion on applications associated with a particular trade ally, an inspection be scheduled. Navigant also suggests that a procedure be established for performing additional inspections on additional sites by the same contractor when irregularities are revealed during an inspection. These recommendations have not yet been implemented due to delays in obtaining a third party contractor to provide verification services.

Conclusions

The evaluation team found that the Home Energy Efficiency Rebate program had a strong foundation in its first year. WECC, RSG, and EGIA established sufficient verification and due diligence processes to insure project eligibility criteria were met. The operations manual

laid out both the program process and QA/QC plans. Navigant's in-depth interview with the administration and implementation program manager confirmed that key performance indicator goals established in the manual were being put into practice in the program and that quality assurance and verification procedures were being followed as well.

Clear QA/QC procedures are outlined in the operations manual. However, the operations manual did not outline procedures for dealing with situations where customers may have complaints against the trade allies. The team recommends establishing clear procedures for resolving these issues, including procedures for talking with contractors to resolve problems.

Though the program is functioning well from the perspective of due diligence and tracking system set up, the evaluation team found room for improvement in the tracking system database extract. Navigant recommends the removal of unnecessary data fields and ensuring that placeholder values are created in a way that will not cause miscalculations in the future, and also including the results of the on-site inspection in the tracking database. Navigant also suggests that steps should be taken to ensure that all of the information included on the participant application be included in the tracking database, especially customer contact information such as phone numbers. Navigant also noticed that some information was entered inconsistently throughout the tracking system, such as contractor names.

5.6 *Program Theory Logic Model Review*

Program Theory

Program theory is essentially a structured description of the various elements of a program's design: goals, motivating conditions/barriers, target audience, desired actions/behaviors, strategies/rationale, and messages/communications vehicles. The following subsections describe the Home Energy Efficiency Rebate (Home EER) program in these terms.

5.6.1 Program Goals

The main goal of the Home EER program is to achieve long-term therm savings by offering rebates on energy efficient space heating, water-heating, and other prescriptive cost-effective efficiency measures in homes that would not have done so in the absence of the program. The program also has a market transformation goal of increasing the demand for high-efficiency space and water heating equipment.

5.6.2 Motivating Conditions/Barriers

Many consumers do not fully understand the benefits of energy efficient space and water equipment. The Home EER program uses a variety of educational and marketing information to better inform Nicor Gas customers about these benefits.

5.6.3 Target Audience

The program targets the residential sector of the Nicor Gas' service territory. Single family dwellings and multi-family dwellings of three units or less are eligible for participation in the program. After program year 1 (PY1) the program expands to include new construction.

5.6.4 Desired Actions/Behaviors

The program aims to persuade Nicor Gas customers to purchase efficient space heating, water-heating and other prescriptive measures. The program largely relies on the trade allies to perform marketing directly to customers at the time of replacement. However, Nicor Gas also promotes the program directly to its customers via their Web site, mailings, email blasts, bill inserts, and possibly radio and print ads.

5.6.5 Strategies/Rationale

The program's main strategies are customer education, financial incentives, and marketing through trade allies. The implementation contractor recruited HVAC contractors to become trade allies and established a "Contractors Circle;" a group of trade allies that were able to offer time-of-sale markdowns to customers on qualifying equipment.

5.6.6 Messages/Communications Vehicles

The program takes a direct outreach approach to recruit trade allies into the program, and then uses a multi-channel approach to market the program's rebates to end-use customers. Participating trade allies hold much of the responsibility for marketing the program to customers (and receive training on how to do so). However, the program also promotes the program directly to customers through the Nicor Gas Web site, bill inserts, and mass communication.

Program Logic

Figure 5-7 presents the Home EER program logic model diagram showing the linkages between program activities, outputs, and outcomes, and identifying potential external influences. Note that for readability of the graphic, some closely related outputs and outcomes are condensed into single boxes; these outputs and outcomes are presented in more detail in the subsequent tables later in this section.

5.6.7 Resources

The ability of the Home EER program to accomplish the outputs and outcomes likely to result in the program reaching its goals depends in part on the level and quality/effectiveness of inputs (resources) that go into these efforts. There are also external influences that can help or hinder achieving anticipated outcomes. Key program inputs and potential external influences are shown in Table 5-13.

Table 5-13. Program Inputs and Potential External Influences

Program Inputs
• Nicor ratepayer funds • Nicor staff resources • Program administrator and implementer staff resources and experience • Utility knowledge of the target market
External Influences and Other Factors
• Current economic conditions • Gas prices • Weather conditions (e.g. a mild winter may lead fewer customers to replace their heating systems) • Cultural attitudes toward energy efficiency and conservation

5.6.8 Activities

The Home EER program seeks to influence residential customers and trade allies through the activities summarized in. These activities are organized into the following groups:

- Develop informational and marketing collateral
- Recruit and train trade allies
- Conduct marketing and outreach to Nicor Gas customers
- Provide incentives for efficient measures
- Institute QA/QC process and tracking system

Figure 5-9. Program Inputs and Potential External Influences

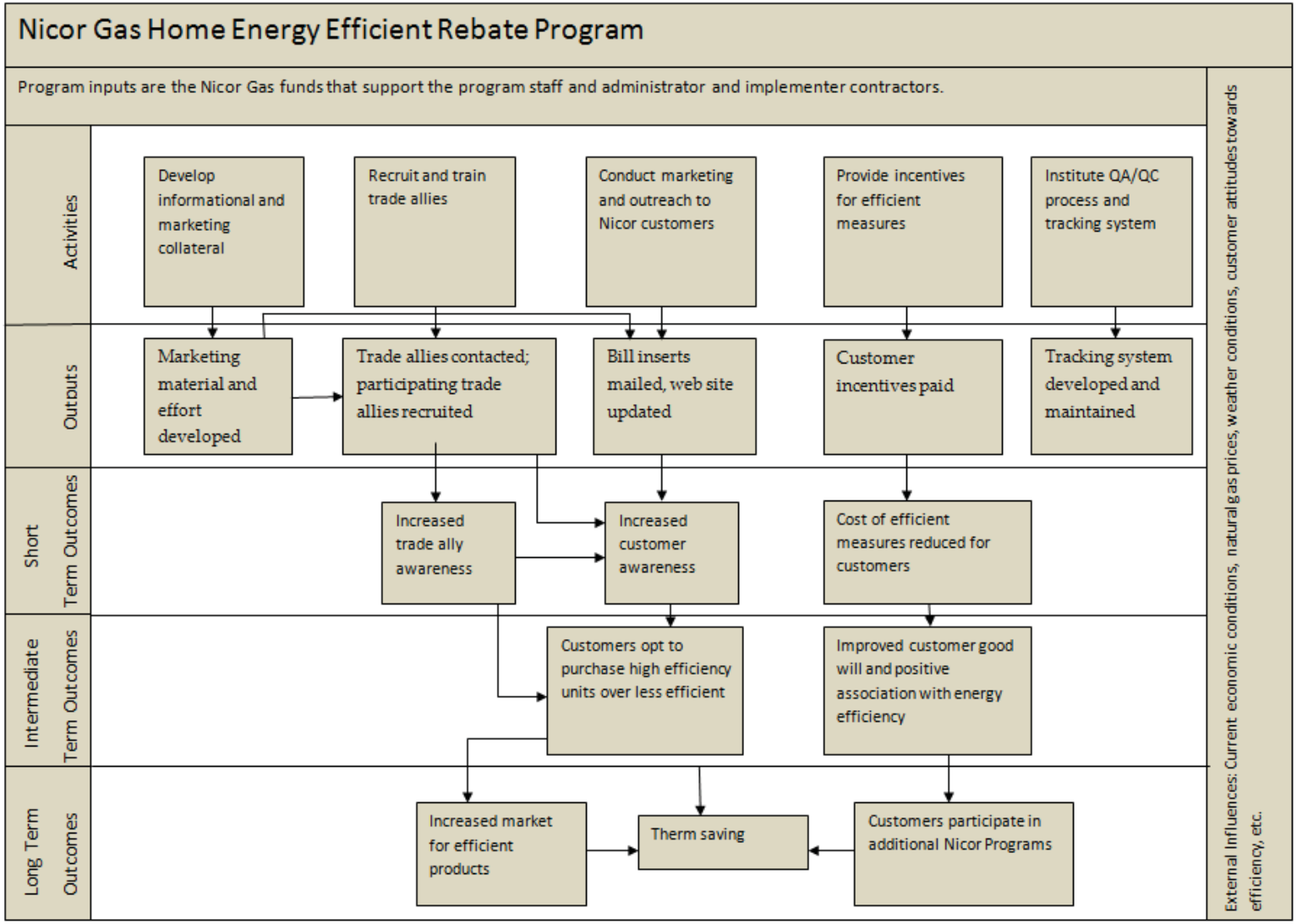


Table 5-14. Home Energy Efficiency Rebate Program Activities

Develop Informational and Marketing Collateral
• Update website with information on programs • Develop materials to market program to potential trade allies • Prepare marketing materials to provide to trade allies for their customers, such as brochures.
Recruit and train trade allies
• The Implementation contractor conducts direct outreach to HVAC contractors to recruit them into the program • Program provides participating trade allies with point-of-sale materials, and program FAQs • Program trains participating trade allies in promoting the program and the program application process, including the process for instant rebates/markdowns
Conduct Marketing and Outreach to Nicor Gas Customers
• The implementation contractor promotes the Home EER program and its participating trade allies on its Web site and in bill inserts • The implementation contractor possibly develops and airs television and radio ads promoting the Home EER program
Provide Incentives for Efficient Measures
• The implementation contractor reimburses trade allies that provide rebates to their customers at time of sale, Nicor Gas reimburses the implementation contractor • The implementation contractor reviews participating customer rebate applications and issues rebates upon approval, Nicor Gas reimburses the implementation contractor
Institute QA/QC Process and Tracking System
• The implementation contractor maintains program tracking system. • The program administrator implements QA/QC process

5.6.9 Outputs, Outcomes and Associated Program Progress Indicators

It is important to distinguish between outputs and outcomes. For the purposes of this logic document, outputs are defined as the immediate results from specific program activities. On a continuum, program activities will lead to immediate outputs that, if successful, will collectively work toward achievement of anticipated short, intermediate, and long-term program outcomes.

The following tables list outputs (Table 5-15) and outcomes (Table 5-16), taken directly from the logic model, and associated measurable progress indicators. For each indicator, a potential data source or data collection approach is presented. Note that Navigant's evaluation may not collect data related to *all* progress indicators because of the need to keep interviews and surveys to reasonable lengths. In some cases, the evaluation may rely on anecdotal evidence from in-depth interviews rather than an extensive primary data collection effort for a specific progress indicator.

Table 5-15. Program Outputs, Associated Indicators, and Potential Data Sources

Outputs	Program Progress Indicators	Data Sources and Potential Collection Approaches
Trade Ally Recruitment	Brochures and FAQs developed Number of trade ally outreach events/information sessions held Number of trade allies contacted directly Number of trade allies recruited to participate in the program	Interviews with program staff Program Operations Manual Program tracking data
Participating Trade Ally Point-of-Sale Marketing Collateral	Number of point-of-sale marketing materials distributed Content of point-of-sale marketing materials	Interviews with program staff Program tracking data Electronic copies of print materials
Bill Inserts	Number of bill inserts sent Content of bill inserts	Interviews with program staff Marketing/communications records Electronic copies of print materials
Web site, and e-mails	Content of Web site, emails	Nicor Gas Web site
Trade Ally Reimbursements	Number of Trade Ally reimbursements paid Dollar amount of Trade Ally reimbursements paid	Program tracking database
Customer Incentives	Number of customer incentives paid, by measure type Dollar amount of customer incentives paid, by measure type	Program tracking database

Table 5-16. Program Outcomes, Associated Indicators and Potential Data Sources

Outcomes	Program Progress Indicators	Data Sources and Potential Collection Approaches
Short-Term		
Increased trade ally awareness of program benefits	Increasing trade ally understanding of the benefits of efficient measures Increasing trade ally familiarity with strategies to market efficient products Increasing trade ally understanding of rebate application process	Participating trade ally interviews Non-participating trade ally interviews
Increased residential customer awareness of program incentives	Increasing customer awareness of Nicor Gas incentives for rebated measures	Participating trade ally interviews Participating customer survey Non-participant customer survey
Increased residential and small commercial customer awareness of the benefits of energy efficient measures	Increasing customer awareness of benefits of choosing efficient measures Increasing customer preference for efficient measures	Participating trade ally interviews Participating customer survey Non-participant customer survey
Trade allies are motivated to actively market efficient products to their customers	Increasing efforts by trade allies to market efficient measures to customers	Participating trade ally interviews Participating customer survey
Upfront cost of efficient products is reduced for customers	Average program incentive to customer Percent of total cost covered by program incentives	Participating trade ally interviews Participating customer survey Program tracking database
Intermediate-Term		
Residential customers opt to purchase efficient units over less efficient units	Number and percent of efficient units purchased, by product type Number of "spillover" purchases of energy-efficient products, not incented through program, by product type	Participating trade ally interviews Program tracking database Participating customer survey
Improved customer goodwill toward Nicor Gas and its programs	Customer satisfaction with incentive and experience Impact on customer attitude about Nicor Gas	Participating customer survey
Positive associations with energy efficiency	Customer attitudes toward energy efficiency	Participating customer survey
Longer-Term		
Gas savings	Verified therm savings	Program tracking database Engineering review of savings algorithms

Outcomes	Program Progress Indicators	Data Sources and Potential Collection Approaches
Customers participate in additional Nicor Gas programs	Number of participants who subsequently participate in additional Nicor Gas programs	Participating customer survey

5.7 *Data Collection Instruments*

5.7.1 Participant Survey

INTRODUCTION

INTRO1 Hello, my name is _____, and I'm calling on behalf of Nicor Gas to ask your help in evaluating the energy efficiency program that gave you a rebate on equipment you had installed in your home in <PARTIC_DATE>. Let me assure you that this is not a sales call.
May I speak with <**CUST NAME**>?

1. CONTINUE WITH CUSTOMER ONCE THEY ARE ON THE PHONE
2. CUSTOMER NOT AVAILABLE [SCHEDULE CALLBACK]
3. NOT A GOOD TIME TO CONDUCT SURVEY [SCHEDULE CALLBACK]

INTRO2 Nicor Gas has hired us to evaluate their energy efficiency programs, and we'd like to talk briefly with you because records in Nicor Gas' files show that you took part in their Home Energy Efficiency Rebate program this past year and installed a either a high efficiency furnace, boiler or water heater and redeemed a program rebate.

SCREENING QUESTIONS AND MEASURE IDENTIFICATION

SCR1 Do you live at <SERVICE_ADDRESS>?

1. YES [SKIPTO SCR2]
2. NO
3. NOT NOW, BUT I DID LIVE THERE

888. Don't Know [SKIP TO THANK8]
999. Refused [SKIP TO THANK8]

SCR2 The **Home Energy Efficiency Rebate** Program gives a cash rebate for Nicor Gas customers buying a high-efficiency furnace, boiler, or water heater. The check may have been paid directly to the equipment contractor, in which case you should have been seen a rebate reducing the cost of equipment on the contractor's bill. Do you remember the program?

1. YES [SKIPTO EQT1]
2. NO, I don't recall having any equipment installed in the past year (since May 2011) [SKIP TO SCR2A]
3. YES I had equipment installed but I don't recall hearing about a Nicor Gas rebate. [SKIPTO EQT1]

888. Don't Know
999. Refused

SCR2A Is there someone in the household at <SERVICE_ADDRESS> who might recall the program and could talk about your household's experience with the Home Energy Efficiency Rebate program?

1. YES [ASK TO SPEAK WITH PERSON WHO RECALLS PROGRAM & CONTINUE WITH THAT PERSON; take call-back info] [SKIPTO INTRO2]

2. NO, I'm sure your records are in error. [SKIPTO THANK8]
888. Don't Know
999. Refused

[QUALIFIED RESPONDENT – QAL STATEMENT]

The following questions refer to the Home Energy Efficiency Rebate Program, which may be referred to as "the Program" or the "HEER Program" throughout the survey.

EQT1 What type of equipment did you have installed under the Nicor Gas HEER program? [ACCEPT MULTIPLE]
1. Furnace
2. Boiler
3. Water Heater
4. Complete System Replacement (Furnace and Central Air Conditioning)
000. NONE OF THE ABOVE [SKIP TO THANK2]
888. Don't Know
999. Refused

EQT1B. Did you receive Nicor Gas rebates on more than one piece of gas-fueled equipment since May 2011? [example: customer could have received rebate for a boiler and a furnace, or for two furnaces for single building or for two boilers.]
1. YES
2. NO
888. Don't Know
999. Refused

[IF EQTIB = 1]
EQT1C. You indicated you received Nicor Gas rebates on more than one piece of gas-fueled equipment. Which was the most expensive piece of equipment covered by the Nicor Gas Rebate?
1. Furnace
2. Boiler
3. Water Heater
888. Don't Know
999. Refused

[Inform the customer that all questions in rest of survey should be answered only for the most expensive piece of equipment covered by a Nicor Gas rebate]

[IF EQT1C = Furnace or Boiler ask EQT2 – ER2]
EQT2. What was the approximate age of the <furnace or boiler> you replaced?
RECORD YEARS [IF UNCERTAIN, ASK OPTIONS BELOW]
1. Less than 10 years old (installed 2001 or later)
2. 11 to 20 years old (installed 1991-2000)
3. 21-30 years old (installed 1981-1990)
4. More than 30 years old (installed before 1981)
888. Don't Know
999. Refused

ER1. Which of the following statements best describes the performance and operating condition of the equipment you replaced through the program?

1. Existing equipment was fully functional and without significant problems.
2. Existing equipment was functional but with some problems.
3. Existing equipment was functioning, but with significant problems.
4. Existing equipment had failed or did not function.

000. Other [RECORD VERBATIM]
888. (Don't know)
999. (Refused)

[IF ER1 = 1, 2, 3]

ER2. How many more years do you think the replaced equipment would have lasted?
RECORD ESTIMATE USEFUL LIFE

888. (Don't know)
999. (Refused)

[IF EQT1C = Furnace ASK CSR1]

CSR1. When you replaced your furnace, did you consider replacing your air conditioning system at the same time?

1. Yes, and I replaced my air conditioning system.
2. Yes, and I considered replacing my air conditioning system, but did not replace it.
3. No, and I did not consider replacing my air conditioning system.

000. Other [RECORD VERBATIM]
888. (Don't know)
999. (Refused)

[IF CSR1 = 1]

CSR2. What were the factors that influenced your choice of air conditioning unit? [DO NOT READ – ACCEPT MULTIPLE]

1. It was energy efficient
2. My contractor recommended it
3. It was affordable
4. Ability to get a rebate

000. Other [RECORD VERBATIM]
888. (Don't know)
999. (Refused)

CSR2. Do you know what the SEER rating of your new air conditioning unit is?

1. Yes – RECORD SEER
2. No

888. (Don't know)
999. (Refused)

[IF CSR2 = 2]

CSR2a. Do you know if your new air conditioning unit is energy efficient?

1. Yes
2. No

888. (Don't know)
999. (Refused)

[IF CSR1 < 14.5 OR CSR2a = 2]

CSR2b. Were there any reasons why you did not choose a 14.5 SEER or greater/an energy efficient air conditioning system? [DO NOT READ, ACCEPT MULTIPLE]

1. Too expensive
2. Not aware of availability
3. No utility incentive for AC
000. Other [RECORD VERBATIM]
888. (Don't know)
999. (Refused)

[IF CSR1 = 2, 3]

CSR3. Did your furnace contractor discuss possibly replacing your air conditioning system with you when you replaced your furnace?

1. Yes, we did discuss it.
2. No, we did not discuss it.
000. Other [RECORD VERBATIM]
888. (Don't know)
999. (Refused)

[IF CSR1 = 2]

CSR4. What were the reasons that you did not replace your air conditioning unit? [DO NOT READ, ACCEPT MULTIPLE]

1. Too expensive
2. Air Conditioning System works fine
3. No utility incentive to replace AC
000. Other [RECORD VERBATIM]
888. (Don't know)
999. (Refused)

[IF EQT1 = Complete System Replacement, ask EQT3 - ER2FUR]

EQT3. What was the approximate age of the central air conditioning system that you replaced? RECORD YEARS [IF UNCERTAIN, ASK OPTIONS BELOW]

1. Less than 10 years old (installed 2001 or later)
2. 11 to 20 years old (installed 1991-2000)
3. 21-30 years old (installed 1981-1990)
4. More than 30 years old (installed before 1981)
888. Don't Know
999. Refused

ER1AC. Which of the following statements best describes the performance and operating condition of the air conditioning system you replaced through the program?

1. (Air conditioning system was fully functional and without significant problems)
2. (Air conditioning system was functional but with some problems)
3. (Air conditioning system was functioning, but with significant problems)
4. (Air conditioning system had failed or did not function.)
000. Other [RECORD VERBATIM]
888. (Don't know)
999. (Refused)

[IF ER1AC = 1, 2, 3]

ER2AC. How many more years do you think the air conditioning system would have lasted?

RECORD ESTIMATE USEFUL LIFE

888. (Don't know)

999. (Refused)

ER1FUR. Which of the following statements best describes the performance and operating condition of the furnace you replaced through the program?

1. (Furnace was fully functional and without significant problems)
2. (Furnace was functional but with some problems)
3. (Furnace was functioning, but with significant problems)
4. (Furnace had failed or did not function.)

000. Other [RECORD VERBATIM]

888. (Don't know)

999. (Refused)

[IF ER1FUR = 1, 2, 3]

ER2FUR. How many more years do you think the furnace would have lasted?

RECORD ESTIMATE USEFUL LIFE

888. (Don't know)

999. (Refused)

BM6. Are the measures you installed during the HEER Program *still* installed and operational?

1. Yes
2. No

888. Don't Know

999. Refused

[Ask BM6A through BM6D if BM6=2]

BM6A. What is no longer installed and/or operational? [DO NOT READ, accept multiple]

1. Boiler
2. Furnace
3. Water Heater
4. Central Air Conditioning

888. Don't Know

999. Refused

BM6B. Why is it no longer installed and/or operational?

OPEN ENDED – RECORD VERBATIM

888. Don't Know

999. Refused

BM6D. Did you replace it with equipment of the same efficiency, higher efficiency, or lower efficiency?

1. Same efficiency
2. Higher efficiency
3. Lower efficiency
4. Did not replace yet

000. Other: (verbatim)

888. Don't Know

999. Refused

FREE RIDERSHIP

[IF EQT1 = Complete System Replacement, ask FR1 – FRCC1 twice, once for air conditioning system and once for furnace, alternating between respondents.]

Sample Variables:

- <PRODUCT CATEGORY> = broad category such as "furnace", "boiler", etc.

FR1. At the time that you first heard about this program, had you already been thinking about purchasing new <PRODUCT CATEGORY> for this property?

1. (Yes) [CONTINUE TO FR2]
2. (No) [SKIP TO FR5]
888. (Don't know) [SKIP TO FR5]
999. (Refused) [SKIP TO FR5]

FR2. Had you already began researching or collecting information about <PRODUCT CATEGORY> to aid in your purchase decision?

1. (Yes) [CONTINUE TO FR3]
2. (No) [SKIP TO FR5]
888. (Don't know) [SKIP TO FR5]
999. (Refused) [SKIP TO FR5]

FR3. Had you already selected which <PRODUCT CATEGORY> you were planning to purchase?

1. (Yes) [CONTINUE TO FR4]
2. (No) [SKIP TO FR5]
888. (Don't know) [SKIP TO FR5]
999. (Refused) [SKIP TO FR5]

FR4. Was the <PRODUCT CATEGORY> that you planned to purchase lower efficiency, the same efficiency, or higher efficiency than the one you ended up installing through the program?

1. Lower efficiency [SKIP TO FR6]
2. The same efficiency [SKIP TO FR6]
3. Higher efficiency [SKIP TO FR6]
888. (Don't know) [CONTINUE TO FR5]
999. (Refused) [CONTINUE TO FR5]

FR5. Just to be sure I understand, did you have any specific plans to purchase and install <MEASURE> before learning about the program? I'm asking specifically about the high efficiency <Product Category> that you installed. [BE SURE THAT THE INTERVIEWEE UNDERSTANDS THAT WE ARE ASKING ABOUT THE HIGH EFFICIENCY MEASURE]

1. Yes [CONTINUE TO FR6]
2. No [SKIP TO A1CSR]
8. (Don't know) [SKIP TO A1CSR]
9. (Refused) [SKIP TO A1CSR]

FR6. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have installed <MEASURE> if you had not received an incentive from the program? I'm asking specifically about the high efficiency <Product Category> that you installed.

NUMERIC OPEN END from 0 to 10

888. (Don't know)

999. (Refused)

I'm going to read two statements about the <MEASURE> you installed. On a scale of 0 to 10, where 0 is strongly disagree and 10 is strongly agree, how much do you agree with each statement.

FR7. There may have been several reasons for the installation of the < MEASURE>, but the program was a critical factor in my decision to have the < MEASURE> installed. Remember, I'm asking specifically about the high efficiency <Product Category> that you installed.

NUMERIC OPEN END from 0 to 10
888. Don't know
999. Refused

IF ER1, ER1AC, or ER1FUR = 4 SKIP FR8;

FR8. I would have installed <MEASURE> within a year of when I did, if I had not received an incentive from the program.

NUMERIC OPEN END from 0 to 10
888. Don't know
999. Refused

Consistency Check & Resolution

[FRCC1 will be asked only for those respondents who have a clear inconsistency between responses (i.e., all but one of the questions are at one end of the spectrum for free ridership while one question is at the other spectrum.) The question responses that will be used to trigger FRCC1 are:

- FR6 (how likely is it that you would have installed the same item)
- FR7 (program was a critical factor in my decision to install item)
- FR 8(would have installed item within a year, without the program)

{IF FR6 = 0, 1, 2 AND FR7 = 0, 1, 2 AND FR8 = 8, 9, 10, ASK FRCC1. INCONSISTENCY1 = 'you would likely not have installed the <MEASURE> without the program but that differs from when you said the program was not a critical factor and you would install the [insert MEASURE] within a year'}

{IF FR6 = 8, 9, 10 AND FR7 = 8, 9, 10 AND FR8 = 0, 1, 2, ASK FRCC1. INCONSISTENCY1 = 'you would likely have installed the <MEASURE> without the program but that differs from your response that the program was a critical factor and you would not have installed the <MEASURE> within the year'}

{IF FR6 = 0, 1, 2 AND FR7 = 0, 1, 2 AND FR8 = 0, 1, 2, ASK FRCC1. INCONSISTENCY1 = 'the program was not a critical factor in your decision to install the <MEASURE> but that differs from your response that you would not have installed the <MEASURE> within the year'}

{IF FR6 = 8, 9, 10 AND FR7 = 8, 9, 10 AND FR8 = 8, 9, 10, ASK FRCC1. INCONSISTENCY1 = 'the program was a critical factor in your decision to install the <MEASURE> but that differs from your response that you would have installed <MEASURE> within the year without the program'}

{IF FR6 = 8,9,10 AND FR7 = 0,1,2 AND FR8 = 0,1,2, ASK FRCC1. INCONSISTENCY1= 'you would not have installed the <MEASURE> within the year but that differs from your response that the program was not a critical factor and you were likely to install the <MEASURE> without the program'}

{IF FR6 = 0,1,2 AND FR7 = 8,9,10 AND FR8 = 8,9,10, ASK FRCC1. INCONSISTENCY1='you would have installed the <MEASURE> within the year but that differs from your response that you were not likely to install the <MEASURE> and the program was a critical factor'}]

FRCC1. Let me make sure I understand you. Earlier, you said <INCONSISTENCY1>.
Please tell me in your own words what influence, if any, the program had on your decision install the <MEASURE> at the time you did?

OPEN-END, RECORD VERBATIM RESPONSE, CLARIFY AS NECESSARY
888. Don't know
999. Refused

CSR PARTICIPATION DECISION

[IF EQT1 = Complete System Replacement, ask A1CSR - A3A_FUR]

A1CSR. Thinking back to when you first decided to contact an equipment installation contractor, which of the following statements best describes the reason you decided to call a contractor? [Record all mentioned, but *ask* which was the single MOST important reason and record separately]

1. When the furnace broke down
2. When the air conditioning system broke down
3. Something else broke down, not directly related to the CSR equipment purchases made with this contractor.
4. When you learned there were rebates or discounts available for a limited time
5. When you were reminded that you could reduce your monthly utility bills by upgrading to more efficient technology

000. Other: (verbatim)
888. Don't Know
999. Refused

A2CSR. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how much influence would you say that the contractor played in your to participate in the CSR?

NUMERIC OPEN END from 0 to 10
888. (Don't know)
999. (Refused)

PARTICIPATION DECISION

[IF EQT1C = Furnace or Boiler ask A1 – A3]

A1. Thinking back to when you first decided to contact an equipment installation contractor, which of the following statements best describes the reason you decided to call a contractor? [Record all mentioned, but *ask* which was the single MOST important reason and record separately]

1. When the equipment you had broke down or gave signs that it was near end of useful life
2. Something else broke down, not directly related to the most-expensive purchase made with this contractor.
3. When you learned there were rebates or discounts available for a limited time
4. When you were reminded that you could reduce your monthly utility bills by upgrading to more efficient technology

000. Other: (verbatim)
888. Don't Know
999. Refused

A2. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how much influence would you say that the contractor played in your decision about which specific type of technology or model to install?

NUMERIC OPEN END from 0 to 10
888. (Don't know)
999. (Refused)

[ASK ALL]
A4. Do you remember how you heard about the HEER Program offered by Nicor Gas
[DO NOT READ, ACCEPT MULTIPLE]

1. A Nicor Gas bill insert
2. Radio, TV, magazine or newspaper ad
3. Heating contractor
4. Word of mouth
5. The Nicor Gas web site
6. A special event like a home show
7. Brochure
8. Internet
9. Customer called Nicor Gas to ask about reducing energy bill
10. Utility representative – other
11. Through a homeowner's association or other organization
12. Through another utility program
13. Were there any other ways you heard about the program? **[SPECIFY]**
888. Don't Know
999. Refused

[ASK IF A4=12]
P1a. Through which utility program?
OPEN ENDED – RECORD VERBATIM
888. Don't Know
999. Refused

[SKIP IF A4=1]
P1b. Do you recall receiving information about the program through the mail?
1. Yes
2. No
888. Don't Know
999. Refused

[ASK IF P1b=1 OR P1=1, ELSE SKIP TO P2b]
P2. Thinking about the materials you received through the mail, how useful were the materials in providing you information about the program? Would you say they were…

1. Very useful
2. Somewhat useful
4. Not very useful
5. Not at all useful
888. Don't Know
999. Refused

[ASK IF P2 = 3, 4]

P2a. What would have made the materials more useful to you? [MULTIPLE RESPONSE]

1. More detailed information
2. Where to get additional information
000. Other: (verbatim)
888. Don't Know
999. Refused

P2b. How would you suggest Nicor Gas try to reach out to their customers to get them to participate in this program? [DO NOT READ. ALLOW MULTIPLE RESPONSES]

1. With program representatives
2. With phone calls
3. Flyers/ads/mailings
4. Bill inserts
5. Homeowners association
6. Through building supply and appliance stores
7. Email
8. Social media
000. Other, specify
888. Don't know
999. Refused

A5. I'm going to read you a list of reasons we've heard why people participate in programs like this one, why people choose to purchase high efficiency units over lower efficiency ones. Please tell me if you STRONGLY AGREE, AGREE, DISAGREE OR STRONGLY DISAGREE with each reason as it applies to your decision to participate in the **Home Energy Efficiency Rebate** Program.

[ROTATE A5A – A5H]
[For A5A – A5H, RE-READ SCALE FOR AT LEAST EVERY THREE ITEMS]

Do you strongly agree, agree, disagree or strongly disagree that you participated in the **HEER** Program in order to…?

1. Strongly agree
2. Agree
3. Disagree
4. Strongly Disagree
888. Don't know
999. Refused

A5A. Protect the environment
A5C. Have more confidence that I'd get a reliable, quality unit
A5D. Have more confidence that I'd cut energy bills
A5E. Get a rebate on energy-efficient equipment
A5F. Increase household comfort
A5H. Increase the resale value of my home
A5I. Lower my energy bills

A6. Are there any other reasons that influenced your decision to participate in the HEER Program?

1. YES

2. NO [SKIPTO SO1]
888. Don't know
999. Refused

A6A. [ASK IF A6 = 1] What were the other reasons for participating in Nicor Gas' rebate program?

OPEN-END, RECORD VERBATIM RESPONSE, CLARIFY AS NECESSARY
888. Don't know
999. Refused

SPILLOVER

SO1. Have you purchased and installed any additional energy efficiency measures since participating in the program?

1. Yes
2. No
888. Don't know
999. Refused

[ASK IF SO1 = 1, ELSE SKIP TO PGMSAT]

SO2. What have you installed?

OPEN ENDED – RECORD VERBATIM
888. Don't know
999. Refused

SO3. How many/much additional <insert MEASURE from E7> have you installed?

OPEN ENDED – RECORD VERBATIM
888. Don't know
999. Refused

SO1. Did you receive a utility rebate for these additional <insert MEASURE from E7> that you installed?

1. Yes
2. No
888. Don't know
999. Refused

SO4. How influential was the program in encouraging you to install the additional [insert MEASURE from SO2]? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

NUMERIC OPEN END from 0 to 10
888. Don't know
999. Refused

SO5. You gave the program a score of <NUMERIC FROM SO4>. Can you please explain how the program influenced your decision to install the additional [insert MEASURE from SO2]?

RECORD VERBATIM
888. Don't know
999. Refused

BEHAVIORAL CHANGES

E4B. Have you adjusted the thermostat for space heating to a hotter or cooler temperature?

1. Yes, raised the thermostat to a higher temperature setting
2. Yes, lowered the thermostat to a lower temperature setting
3. No, kept the temperature setting the same as before

000. OTHER - RECORD
888. Don't know
999. Refused

E4C. [FOR COMPLETE SYSTEM REPLACEMENT REBATES] Have you adjusted the thermostat for space cooling to a hotter or cooler temperature?

1. Yes, raised the thermostat to a higher temperature setting
2. Yes, lowered the thermostat to a lower temperature setting
3. No, kept the temperature setting the same as before

000. OTHER - RECORD
888. Don't know
999. Refused

OVERALL PROGRAM SATISFACTION

PGMSAT. We'd like you to describe your overall experience with Nicor Gas' rebate program, using a number scale from 0 to 10. Please choose a number between 0-and-10, where zero means not at all satisfied and 10 means very satisfied. Thinking of your overall experience, how do you feel about the HEER program?

NUMERIC OPEN END from 0 to 10
888. Don't know
999. Refused

[ASK IF PGMSAT is 5 or less]

PGMSAT2. Your rating suggests that you were not fully satisfied. If that is so, could you tell me what kept you from full satisfaction?

OPEN-END, RECORD VERBATIM RESPONSE, CLARIFY AS NECESSARY
888. Don't know
999. Refused

SATISFACTION WITH SUB-PROCESSES

S1. I'd like to ask you about a variety of items that may have affected your experience in the program for better or worse.
As I read the list, please rate each on a scale of 0 to 10, where 0 is not at all satisfied and 10 is very satisfied. For parts of the program that do not apply to you, just say so.

[DO NOT ROTATE – PROCESSES S1A-S1J]
[RE-READ SCALE FOR AT LEAST EVERY THREE ITEMS]

NUMERIC OPEN END from 0 to 10
777. Not Applicable
888. Don't know
999. Refused

Please rate your satisfaction with…

S1A. The Nicor Gas rebate information you received before signing up for the program.

S1B. The application process
S1C. The phone staff at Nicor Gas
S1Ca. [FOR COMPLETE SYSTEM REPLACEMENT REBATES] The phone staff at ComEd
S1D. The program website
S1E. The speed in getting the rebate to you
S1F. The quality of work by the **contractor** who installed the new equipment
S1G. The performance of the [MEASURE]

S3a. Is there anything about the program that you think was done particularly well?
OPEN-END, RECORD VERBATIM RESPONSE, CLARIFY AS NECESSARY
888. Don't know
999. Refused

S3b. What do you see as the drawbacks to participating in the program?
[DO NOT READ LIST - MULTIPLE RESPONSES, UP TO 3]
1. Paperwork too burdensome
2. Incentives not high enough/not worth the effort
3. Program is too complicated
4. Cost of equipment
5. No drawbacks
000. Other, specify
888. Don't know
999. Refused

S3c. Is there anything about the program that you think could be improved?
OPEN-END, RECORD VERBATIM RESPONSE, CLARIFY AS NECESSARY
888. Don't know
999. Refused

BUZZ FACTOR

G1. Have you recommended the program to people outside your household?
1. Yes
2. No, I have not recommended the program
888. Don't know
999. Refused

[ASK IF G1=A]
G1A How many people have you recommended the program to outside your household?
NUMERIC OPEN END
888. Don't know
999. Refused

[ASK IF G1 = 2, 888]
G2. Would you recommend the program to other people?
1. Yes
2. No
888. Don't know
999. Refused

[ASK IF G2 =B OR C]

G3. Why not?
OPEN-END, RECORD VERBATIM RESPONSE, CLARIFY AS NECESSARY
888. Don't know
999. Refused

THERMOSTATS

TSTAT0. Thank you for taking the time to answer questions about your participation in the HEER program. I understand that your time is valuable, but if you able, would you be willing to answer a few additional questions about thermostat usage in your home? The additional questions will take about 5 minutes.

1. Yes [ASK TSTAT1 – TSTAT13]
2. No [SKIP TO Q1]

TSTAT1. Does your home use one or more thermostats to control heating and/or cooling?

1. Yes
2. No [SKIP TO Q1]
888. Don't know [SKIP TO Q1]
999. Refused [SKIP TO Q1]

TSTAT2. How many programmable thermostats are in your home? [IF NECESSARY] One that lets you program a schedule and set the temperature up or down at different times of the day and/or different days of the week.

RECORD NUMBER
888. Don't know
999. Refused

TSTAT3. How many manual thermostats are in your home? [IF NECESSARY] One that you have to manually adjust and that has only one setting for the internal temperature you want.

RECORD NUMBER
888. Don't know
999. Refused

TSTAT4. [IF TSTAT2 +TSTAT3 >1 ask "Do any of your thermostats", if TSTAT2 + TSTAT3 =1, ask "Does your thermostat"] control when your air conditioning turns on and off in your home?

1. Yes
2. No
888. Don't know
999. Refused

[IF TSTAT2 + TSTAT3 >1]

Please think about the thermostat that controls [IF TSTAT4=1 say "air conditioning in"] the largest amount of living space in your home to answer the following questions about the thermostats.

[IF ANSWER TO TSTAT2 AND TSTAT3 ARE BOTH >0].

TSTAT5. Is this thermostat manual or programmable?

1. Manual
2. Programmable
888. Don't know
999. Refused

TSTAT5a. Does this thermostat also control your heating system?

1. Yes

2. No
888. Don't know
999. Refused

[IF 0 < TSTAT2 < 98 and TSTAT5 does not =1]
TSTAT6. Do you program your thermostat for regular temperature setting changes, do you manually adjust it on occasion, or do you leave it at the same setting always? [PROBE TO FIND THE RESPONSE MOST ACCURATE, CHOOSE ONLY ONE]
Program for regular temperature setting changes [SKIP TO TSTAT7]
Only manually adjust on occasion
Leave at same setting [SKIP TO TSTAT10]
888. Don't know [SKIP TO Q1]
999. Refused [SKIP TO Q1]

[IF TSTAT6 = 2]
TSTAT6a. Which of the following best describes how you manually adjust your programmable thermostat? Do you…
Override setting when it is too hot or too cold
Use override instead of programming regular setting changes
888. Don't know [SKIP TO Q1]
999. Refused [SKIP TO Q1]

[IF TSTAT6=1]
TSTAT7. Please describe how you program your thermostat. [PROBE TO DETERMINE WHICH RESPONSE BELOW IS MOST ACCURATE, CHOOSE ONLY ONE]
Adjusted during night and daytime work hours both summer and winter
Adjust for night only both summer and winter
Adjust for night and daytime work hours, winter only
Adjust for night and daytime work hours, summer only
Adjust for night only, winter only
Adjust for night only, summer only
Adjust for vacations only
Set at one temperature for summer and one temperature for winter
000. Other, specify
888. Don't know [SKIP TO TSTAT11]
999. Refused [SKIP TO TSTAT11]

[IF TSTAT3>0 and TSTAT5 does not =2]
TSTAT8. Do you manually adjust your thermostat regularly, on occasion, or do you leave it at the same setting always? [PROBE TO FIND THE RESPONSE MOST ACCURATE, CHOOSE ONLY ONE]
Adjust for regular temperature setting changes
Only manually adjust on occasion [SKIP TO TSTAT10]
Leave at same setting [SKIP TO TSTAT10]
888. Don't know [SKIP TO TSTAT11]
999. Refused [SKIP TO TSTAT11]

[IF TSTAT8 = 1]
TSTAT9. Please describe how you regularly adjust your thermostat. [PROBE TO DETERMINE WHICH RESPONSE BELOW IS MOST ACCURATE, CHOOSE ONLY ONE]
Adjusted for night and daytime work hours both summer and winter

Adjust for night only both summer and winter
Adjust for night and daytime work hours, winter only
Adjust for night and daytime work hours, summer only
Adjust for night only, winter only
Adjust for night only, summer only
Adjust for vacations only
Set at one temperature for summer and one temperature for winter
000. Other, specify
888. Don't know [SKIP TO TSTAT11]
999. Refused [SKIP TO TSTAT11]

TSTAT10. Approximately how long have you been operating your thermostat this way? Would it be…
Less than 3 months
3 to less than 6 months
6 months to less than 9 months
9 months to a year
More than a year
888. Don't know
999. Refused

TSTAT11. What temperature setting is your thermostat typically set for at night in the winter, would it be…
Less than 62
63 to 66°F
66-69°F
70-74°F
75-79°F
80°F or higher
888. Don't know
999. Refused

[ASK IF TSAT4 = YES]
TSTAT12. What temperature setting is your thermostat typically set for at 4 p.m. in the summer, would it be…
Less than 62
63 to 66°F
66-69°F
70-74°F
75-79°F
80°F or higher
888. Don't know
999. Refused

TSTAT13. Approximately what percentage of your home's living space has the temperature controlled with this thermostat? Would it be…
Less than 10%
11-20%
21-30%
31-40%

41-50%
51-60%
61-70%
71-80%
81-90%
More than 90%
888. Don't know
999. Refused

DEMOGRAPHICS

Q1. I have just a few questions left to ask for classification purposes. "First, do you own or rent the home at <SERVICE_ADDRESS>?"
Own
Rent
000. Other, specify
888. Don't know
999. Refused

Q2. What type of home do you live in? Is it a… [READ LIST]
Single Family detached,
Single Family attached (duplex, town home, etc.)
Multifamily Apartment or Condominium
000. Other, specify
888. Don't know
999. Refused

Q3. How many people currently live full-time in that home, at least six months of the year, including you?
ENTER NUMBER OF PEOPLE
888. Don't know
999. Refused

Q4. Roughly how many square feet of heated space does the home have?
[IF NECESSARY] Please use your best estimate.
ENTER NUMBER OF SQUARE FEET
888. Don't know
999. Refused

[IF Q4 = 888]
Q4a. How many bedrooms does your house have?
RECORD NUMBER
888. Don't know
999. Refused

Q7. Do you have any additional heating equipment in your home?
Electric space heater
Woodstove or fireplace
Propane fireplace
000. Other, specify
888. Don't know

999. Refused

Q8. It's helpful if we can analyze comments by age group. Would you please tell me which of the following categories includes your age? Is it… [READ LIST]
Under 25
25-34,
35-44,
45-54,
55-64, or
65 or older?
888. Don't know
999. Refused

Q9. We're collecting information from hundreds of customers, and it's helpful to know the income boundaries for sets of respondents. This information will not be retained after analysis. I'm going to read a variety of broad income ranges. Would be please stop me when I state the range of income relevant to your household before taxes? Please stop me when I state the range of income that is the correct range. Was your household income last year…
Up to $30,000 per year,
$30,000 to under $50,000,
$50,000 to under 75,000,
$75,000 to under $100,000,
$100,000 to under $150,000,
$150,000 to under $200,000, or
More than $200,000?
888. Don't know
999. Refused

Q10. GENDER (DO NOT ASK)
1 Male
2 Female
3 Unsure

THANK. Thank you for taking time to help with our survey and the helpful information you provided. Have a great day/evening!
[DISPOS = 40]

THKPRXY. Thank you for taking time to help with our survey. However, for this survey we are only interviewing those who, themselves, participated in Nicor Gas Home Energy Efficiency Rebate Program. Have a great day/evening!
[DISPOS = 24]

THANK2. Thank you for taking time to help with our survey. However, for this survey we are only interviewing those who have participated in Nicor Gas Home Energy Efficiency Rebate program
[DISPOS = 25]

THANK8. We cannot continue without that information. Thank you for your time. Have a great day/evening!
[DISPOS = 24]

Trade Ally Survey

SCREENER/INTRODUCTION

INTRO1 Hello, my name is_____ , and I'm calling on behalf of Nicor Gas to ask your organization's feedback on their Home Energy Efficiency Rebate program, specifically how well it has worked for you and how it can be improved. This is not a sales call. May I speak to <CONTACT NAME>?
[IF <CONTACT NAME> IS NULL] May I speak to your residential sales, service or installation manager?
[If not available, request their name and a good time to call back.]

I work for The Blackstone Group, a Research firm hired by Nicor Gas to collect equipment installers' comments. Is this a good time for you to talk? [IF NOT A GOOD TIME for respondent, ask to set appointment for time convenient to the respondent]

The following questions refer to the Home Energy Efficiency Rebate Program, which may be referred to as "the Program" throughout the survey.
[IF OK, go to PD1]

PARTICIPATION DECISION BY TRADE ALLY

PD1. The Home Energy Efficiency Rebate program was launched in June 2010. How did you first learn about the program? [DO NOT READ]
(Trade association) IF YES, RECORD WHICH
(Customer first made me aware)
(Friend in the furnace/boiler/water heater industry)
(Radio)
(TV)
(Other news media)
(Bill insert from Nicor Gas)
(Direct mailing to me from Nicor Gas)
(Nicor Representative)
(RSG Representative)
(Other Utility)
000. Other (verbatim)
Don't Know
Refused

PD3. About how many jobs did you have for the Program between June 2011 and May 2012?
RECORD # [PROBE FOR ESTIMATE IF NECESSARY]
[IF PD3 < 25]
PD3a. Has anything kept you from installing more high-efficiency [FURNACES, BOILERS, OR WATER HEATERS] through the program?
RECORD VERBATIM RESPONSE – CLARIFY AS NECESSARY
888. Don't Know
999. Refused

TRADE ALLY SATISFACTION WITH PROGRAM

Next, I'm going to discuss your satisfaction--as an equipment service and sales professional--with Nicor Gas' Home Energy Efficiency Rebate program.

TASAT1. From your perspective as a gas appliance installer/vendor, overall how satisfied have you been with the Program? Using a number scale from 0 to 10, where zero means "not at all satisfied" and 10 means "very satisfied."
ENTER RATING 0 - 10

888. Don't Know
999. Refused

[ASK IF TASAT1 is 5 or less OTHERWISE SKIP TO TASAT2]
TASAT1b. Your rating suggests that you were not fully satisfied. If that is so, could you tell me what kept you from full satisfaction?
RECORD VERBATIM RESPONSE - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

TASAT2. I'd like to get a sense of your satisfaction with the components of the Program. Using a number scale from 0 to 10, where zero means "Not at all Satisfied" and 10 means "Very Satisfied," how would you rate the following parts of the rebate program? If the item doesn't apply to you, just say so.
FOR A – F ENTER RATING 0 – 10 [IF rating = 5 or less, PROBE WHY, RECORD VERBATIM]
888. Don't Know
999. Refused

A. The promotional materials and marketing efforts by Nicor Gas
B. The application forms and process
C. The brands and models of equipment covered by the program
D. The technical and customer assistance provided by Nicor Gas
E. The speed of getting the rebate to you if you participated in the instant discount process offered by the program
F. The rebate and incentive levels

PERCEIVED CUSTOMER SATISFACTION WITH PROGRAM
TACSAT. Based on your interaction with customers, how satisfied are **they** with the **Home Energy Efficiency Rebate Program**? Giving your best guess, how might customers rate the program on a 0-10 scale where 0 ="Not at all Satisfied" and 10 ="Very Satisfied"?
ENTER RATING 0 - 10
888. Don't Know
999. Refused

[IF TACSAT=5 OR LESS ASK OTHERWISE SKIP TO TACSATC]
TACSATB. Why do you say that?
RECORD VERBATIM RESPONSE - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

TACSATC. If there were one thing Nicor Gas could change about the Program--other than the incentive levels—that might improve customer satisfaction, what would that be?
RECORD VERBATIM RESPONSE - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

TRADE ALLY PROMOTION OF PROGRAM
TAMKTG. Next, I'd like to ask you how you may have marketed the Program to your customers and the awareness of the Program you've seen among customers.
What are the main methods that you used to market the programs to customers?
RECORD VERBATIM RESPONSE - CLARIFY AS NECESSARY

888. Don't Know
999. Refused

TAMKTG 2. Which marketing method(s) have you found to be been most effective?
RECORD VERBATIM RESPONSE - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

NGMKTG. In your opinion, how effectively did Nicor Gas promote the Program to residential customers? On a 0 - 10 scale where 0 ="Not Promoted" and 10 ="Very Well Promoted" based on your gut feeling, how well did Nicor Gas do in promotion to the customer?
ENTER RATING 0 - 10
888. Don't Know
999. Refused

[ASK IF NGMKTG = 5 OR LESS OTHERWISE SKIP TO PROB1]
NGMKTGB. How might Nicor Gas have better promoted the Program to end-users?
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

NGMKTGZ. What was the most significant barrier to participation for customers?
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

PERCEPTION OF NICOR GAS SUPPORT OF TRADE ALLIES

PROB1. Have you had any problems explaining and implementing the Program for your customers?
(Yes)
(No)
888. Don't Know
999. Refused

[ASK IF PROB1= A.YES, OTHERWISE SKIP TO PROB2]
PROB1A. Could you suggest ways that Nicor Gas could have better helped you explain and/or implement the Programs for your customers?
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

PROB2. Have you had any difficulties following Nicor Gas rules for vendors in promoting the Programs?
(Yes)
(No)
888. Don't Know
999. Refused

[ASK IF PROB2 =A. YES]

PROB2A. Would you describe the nature of the problems you had and whether they were ever resolved to your satisfaction?

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

[ASK IF PROB2 =A. YES]

PROB2B. Could you suggest any improvements for future Nicor Gas programs?

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

FACTORS AFFECTING SALES VOLUME

NTG. Has the Nicor Gas Program increased the number of customers **"asking about"** higher efficiency gas-fueled equipment?

(Yes, I think it definitely has increased inquiries)

(Yes, possibly, but it's difficult to tell)

(No, I don't think the program has had much effect yet)

000. Other: (verbatim)

888. Don't Know

999. Refused

NTG2. Has the Nicor Gas Program increased the likelihood that you would recommend higher efficiency gas-fueled equipment?

(Yes, I think it definitely has increased the likelihood)

(Yes, possibly, but it's difficult to say)

(No, I don't think the program has had much effect yet)

000. Other: (verbatim)

888. Don't Know

999. Refused

NTG3. Has the Nicor Gas Program increased the share of higher efficiency gas-fueled equipment that you usually keep in stock?

(Yes, I think it definitely has increased inquiries)

(Yes, possibly, but it's difficult to say)

(No, I don't think the program has had much effect yet)

000. Other: (verbatim)

888. Don't Know

999. Refused

NTGB. Has the low price of gas significantly slowed high efficiency sales in Chicago land?

(Yes)

(No)

000. Other: (verbatim)

888. Don't Know

999. Refused

NTGC. What is your sense of the size of the Do-It-Yourself Market (meaning potential participants installing equipment themselves rather than calling a contractor) in Chicago land?

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

NTGDa. In your opinion, how have the sales of high efficiency <MEASURE CATEGORY> changed since Nicor introduced the program (in 2010)?

(Yes, they have increased)

(Yes, they have decreased)

(No, they stayed the same)

000. Other: (verbatim)

888. Don't Know

999. Refused

NTGD. In your opinion, what were the major factors affecting sales of energy efficient equipment in the last year? [DO NOT READ, RECORD MULTIPLE, PROBE FOR MOST IMPORTANT]

(The economy)

(Natural Gas Prices)

(Nicor Rebate)

(Federal Tax Incentive)

000. Other: (verbatim) 888. Don't Know

999. Refused

WATER HEATER SALES QUESTIONS

WH1. Do you currently sell water heating measure to your customers?

(Yes)

(No)

888. Don't Know

999. Refused

[ASK IF WH1 = 1.YES, OTHERWISE SKIP TO BL1]

WH2. The program rebated storage water heaters with an energy factor greater or equal to 0.67. Have you sold any water heaters that you consider high efficiency that do not qualify for the program?

(Yes)

(No)

888. Don't Know

999. Refused

[ASK IF WH2 = 1, ELSE SKIP TO WH3]

WH2a. What types of high efficiency water heaters that do not qualify for the program have you sold to your customers?

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

WH2b. Approximately what percentage of the water heaters that you sold in the past 12 months do you consider high efficiency?

RECORD %

888. Don't Know

999. Refused

WH3. Have you experienced any difficulties selling high efficiency water heaters to customers?

(Yes)

(No)

888. Don't Know

999. Refused

WH2A. Would you describe the nature of the difficulties you experienced?

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

WH3. Has the Nicor Gas HEER rebate had any effect on your ability to sell higher efficiency water heaters?

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

WH4. Do you have any suggestions to help Nicor Gas increase the share of high efficiency water heaters installed?

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

Naturally Occurring Baseline and Free Ridership

I'm going to ask you some questions about your sales of energy-efficient equipment *prior* to your involvement with the Home Energy Efficiency Rebate Program.

BL1. Prior to your involvement with the Home Energy Efficiency Rebate Program, did you offer your customers a high efficiency option for <MEASURE CATEGORY>?

(Yes)

(No) – SKIP TO BL4

888. Don't Know – SKIP TO BL4

999. Refused – SKIP TO BL4

[IF BL1= "Yes"]

BL2. Prior to your involvement with the Program, how often did you *recommend* the high efficiency option to your customers? Would you say that you recommended it always, often, sometimes, rarely, or never? [If necessary, remind interviewee that you're discussing the pre-program time frame]

Always recommended the high efficiency option

Often

Sometimes

Rarely

Never/Only when customers specifically requested high efficiency options

000. Other: (verbatim)

888. Don't Know
999. Refused

[IF BL1= "Yes"]
BL3. About what percent of the time did customers actually *purchase* the high efficiency option for <MEASURE CATEGORY>, prior to your involvement with the Program?
RECORD PERCENTAGE
888. Don't Know
999. Refused

BL4. Now that you are participating in the Program, have you changed what <MEASURE CATEGORY> products you offer to customers?
(Yes)
(No) – SKIP TO BL8
888. Don't Know – SKIP TO BL8
999. Refused – SKIP TO BL8

[IF BL1=No and BL4=No, ask BL4a, else skip to BL8]
BL4a. Earlier you indicated that you did not offer high efficiency <MEASURE CATEGORY> prior to participation in the program, but then you said that you did not change your offerings since participating. Can you explain in your own words when you began offering high efficiency <MEASURE CATEGORY>?
[RECORD VERBATIM]
888. Don't Know
999. Refused

[IF BL4= "Yes"]
BL5. Please describe the changes that you've made to your product offerings.
[RECORD VERBATIM]
888. Don't Know
999. Refused

BL6. On a scale of 0 to 10, with 10 being the most influential, how much influence did the program have on your decision to change your <MEASURE CATEGORY> offerings?
ENTER RATING 0 - 10
888. Don't Know
999. Refused

BL7. Do you still offer standard efficiency <MEASURE CATEGORY> or do you only stock/offer high efficiency options now?
(Both standard efficiency and high efficiency options)
(High efficiency options only) SKIP TO BL11
000. Other: (verbatim) SKIP TO BL11
888. (Don't Know) SKIP TO BL11
999. (Refused) SKIP TO BL11

[IF BL7=1]
BL8. How often do you recommend that customers purchase the high efficiency options? Would you say that you recommend them always, often, sometimes, rarely, or never?
Always recommended the high efficiency option

Often
Sometimes
Rarely
Never/Only when customers specifically requested high efficiency options
000. Other: (verbatim)
888. Don't Know
999. Refused

[IF BL7=1]
BL9. About what percent of your customers actually *purchase* the high efficiency option for <MEASURE CATEGORY>? Please think about all sales of <MEASURE CATEGORY>, *including but not limited to* the participants in the Program.
RECORD PERCENTAGE
888. Don't Know
999. Refused

[IF BL7=1]
B10. Of those customers who purchase the high efficiency option for <MEASURE CATEGORY>, about what percent of them are *not* participants in the HEER Program? [If necessary, add "You said that approximately [RESPONSE TO B9] of all your customers select the high efficiency option; about how many of those customers are *not* participating in the program?"]
RECORD PERCENTAGE
888. Don't Know
999. Refused

BL11a. Using a 0 to 10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the program had not been available, what is the likelihood that you would have been *recommending* the same high efficiency <MEASURE CATEGORY> products, as provided through the program?
ENTER RATING 0 - 10
888. Don't Know
999. Refused

BL11b. Using a 0 to 10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the program had not been available, what is the likelihood that you would have sold the same volume of high efficiency <MEASURE CATEGORY> products, as provided through the program?
ENTER RATING 0 - 10
888. Don't Know
999. Refused

BL12. On a scale of 0 to 10, with 10 being the most influential, how much influence do you think *your recommendation* has on your customers' decision to select higher levels of efficiency when purchasing <MEASURE CATEGORY>?
ENTER RATING 0 - 10
888. Don't Know
999. Refused

BL13. On a scale of 0 to 10, with 10 being the most influential, how much influence do you think *utility program incentives and educational materials* have on your customers' decision to select higher levels of efficiency when purchasing <MEASURE CATEGORY>?
ENTER RATING 0 - 10

888. Don't Know
999. Refused

[Only ask of people with multiple measure categories; IF <MEASURE CATEGORY 2> is blank, skip to Program Spillover section]

BL14. The questions I just asked focused on your sales of <MEASURE CATEGORY>, but our records indicate that you have also sold other types of gas-fueled equipment that qualify for the Program. Has the program had a similar influence on sales of energy-efficient <MEASURE CATEGORY 2>? Please describe any substantial differences in the program's influence on these sales of <MEASURE CATEGORY 2>.

1. [OPEN ENDED - RECORD VERBATIM]
2. No substantive differences

888. Don't Know
999. Refused

[SKIP BL15 if BL14=2, 888, or 999]

BL15. Using that same 0 to 10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the program had not been available, what is the likelihood that you would have been recommending and selling the same <MEASURE CATEGORY 2> products, as provided through the program?

ENTER RATING 0 - 10
888. Don't Know
999. Refused

PROGRAM SPILLOVER

D1. Did your experience with the Home Energy Efficiency Rebate Program in any way influence you to recommend additional energy efficiency measures to customers which did not receive a program rebate?

(Yes)
(No)
000. Other: (verbatim)
888. Don't Know
999. Refused

[If D1 = "Yes" ask D2 – D6]

D2. What efficiency measures were recommended?
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

D2a. How many of the recommended measures were installed?
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

D3. Please briefly <u>describe how</u> the Program has influenced your decisions to recommend additional high-efficiency measures which did not receive program rebates.
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

D4. On a scale of 0 to 10, with 10 being the most influential, how much influence did the program have on your decision to recommend additional, non-rebated high-efficiency measures?

ENTER RATING 0 - 10

888. Don't Know

999. Refused

NON-PARTICIPANT SPILLOVER

E1. Do you believe that other HVAC Contractors that are not participating in the Program are increasing their sales of energy efficient measures because of the influence of the Program? In other words, are they selling more energy efficient products than they would have if the Program did not exist?

(Yes)

(No)

000. Other: (verbatim)

888. Don't Know

999. Refused

[If E1 = "yes"]

E2. Please briefly describe how the Program is influencing the market for energy efficiency measures in Chicago land.

[Probe for availability, types of equipment, timing, quantity, and efficiency]

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know

999. Refused

COMPLETE SYSTEM REPLACEMENT

[IF <CSR PART> = 0]

CSR1. Are you aware of the Complete System Replacement component of the Home Energy Efficiency Rebate Program?

(Yes)

(No)

000. Other: (verbatim)

888. Don't Know

999. Refused

[If CSR1 = "yes" ASK CSR2-CSR5, else skip to CSR6]

CSR2. Have you participated in the Complete System Replacement component of the Home Energy Efficiency Rebate Program? [Clarify if necessary] Have you sold heating and/or cooling equipment to customers as part of a heating and cooling package rebated by Nicor Gas and ComEd?

(Yes)

(No)

000. Other: (verbatim)

888. Don't Know

999. Refused

[IF <CSR PART> = 1 READ AND ASK CSR3 ON] The following questions are about your experience with the Complete System Replacement component of the Home Energy Efficiency Rebate Program.

[If CSR3 = "yes", ASK CSR3, else skip to CSR4]
CSR3. Did you sell the heating equipment, or both the heating and cooling equipment?
(Heating equipment only)
(Both cooling and heating equipment)
888. Don't Know
999. Refused

[If CSR3 = 1, ASK CSR3a, else skip to CSR4]
CSR3a. What is your relationship to the contractor who sold the cooling equipment?
RECORD VERBATIM
888. Don't know
999. Refused

CSR4. Has the Complete System Replacement component of the Program had any effect on your ability to market and sell energy efficient measures to your customers?
(Yes) [IF YES] How So? [RECORD VERBATIM]
(No)
000. Other: (verbatim)
888. Don't Know
999. Refused

CSR5. Do you have any suggestions for improving the Complete System Replacement component of the Program?
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

[If CSR1 = "No" ASK CSR6 on]

CSR6. Have you had any customers who are replacing their furnace also inquire about replacing their air conditioning system?
(Yes)
(No) [SKIP TO IEELP1]
000. Other: (verbatim)
888. Don't Know
999. Refused

CSR7. Did you suggest to any customers who are replacing their furnace that they also replace their air conditioning system?
(Yes)
(No) [SKIP TO IEELP1]
000. Other: (verbatim)
888. Don't Know
999. Refused

[If CSR6 or CSR7 = 1 ASK CSR8]
CSR8. Did any of these customers go ahead and replace their air conditioning system?
(Yes, they all did)
(Yes, some of them did)
(No, none of them did) [SKIP TO CSR10]

000. Other: (verbatim)
888. Don't Know
999. Refused

[If CSR8 = 1, 2]
CSR9. Did any of these customers replace their air conditioning system with an air conditioning unit with a SEER of 14.5 or greater?
(Yes, they all did)
(Yes, some of them did)
(No, none of them did)
000. Other: (verbatim)
888. Don't Know
999. Refused

[IF CSR9 = 2 or 3 ASK CSR9a and CSR9b]
CSR9a. What was the typical SEER of the replacement units that your customers installed?
RECORD SEER
888. Don't know
999. Refused

CSR9b. In your opinion, what were the reasons that your customers did not choose an air conditioning system of SEER 14.5 or greater? [DO NOT READ, ACCEPT MULTIPLE]
1. Too Expensive
2. No Utility Incentive for AC
000. OTHER [SPECIFY]
888. DON'T KNOW
999. REFUSED

[IF CSR8 = 2, 3]
CSR10. What do you think were the reasons that your customers chose not to replace their air conditioning system at the same time as their furnace? [DO NOT READ, ACCEPT MULTIPLE]
Too Expensive
No Utility Incentive for AC
3. Thought Air Conditioning System Worked Fine
000. OTHER [SPECIFY]
888. DON'T KNOW
999. REFUSED

ILLINOIS ENERGY EFFICIENCY LOAN PROGRAM
IEELP1. Are you aware of the Illinois Energy Efficiency Loam Program?
(Yes)
(No)
000. Other: (verbatim)
888. Don't Know
999. Refused

[If IEELP1 = "yes" ASK IEELP 2 and IEELP 3, else skip to Q1]
IEELP2. Has the Illinois Energy Efficiency Loan Program had any effect on your ability to market and sell energy efficient measures to your customers?
(Yes) [IF YES] How So? [RECORD VERBATIM]

(No)
000. Other: (verbatim)
888. Don't Know
999. Refused

IEELP3. Do you have any suggestions for improving the Illinois Energy Efficiency Loan Program?
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

SIZE AND FOCUS OF TRADE ALLY BUSINESS

Q1. Are you a one-person business, or do you have employees, partners or subcontractors?
[NOTE TO INTERVIEWER: Don't confuse a "one-person business" with the term "sole proprietorship." A sole proprietorship can have one or more employees.]
(Yes, one person business)
(No, it's a partnership with __ working partners) [RECORD NUMBER OF PARTNERS]
(No)
000. Other: (verbatim)
888. Don't Know
999. Refused

[If Q1 = 3 ask Q1a, else ask Q2a]
Q1a. Do you have employees and subcontractors working for you?
RECORD NUMBER FOR A-D
888. Don't Know
999. Refused

Full-time employees
Part-time employees
Subcontractors

Q2a. Approximately how many furnaces do you sell in a year?
ENTER QUANTITY
777. Don't sell furnaces
888. Don't Know
999. Refused

Q2b. Approximately how many boiler do you sell in a year?
ENTER QUANTITY
777. Don't sell boiler
888. Don't Know
999. Refused

[ASK IF WH1 = 1]
Q2a. Approximately how many water heaters do you sell in a year?
ENTER QUANTITY
888. Don't Know
999. Refused

Q4. On average, what is the condition of the appliances that you replace with program equipment? Are they usually…
In excellent condition
In good condition
In fair condition
In poor condition
Broken/inoperable
000. Other: (verbatim)
888. Don't Know
999. Refused

Q5. Approximately what percentage of the time are you able to sell new equipment prior to the failure of existing equipment?
RECORD PERCENTAGE
000. Other: (verbatim)
888. Don't Know
999. Refused

[ASK IF Q5 > 0]
Q5a. When you are able to sell new equipment prior to the equipment, approximately what percentage of the time is it part of a bundled package?
RECORD PERCENTAGE
000. Other: (verbatim)
888. Don't Know
999. Refused

Q6. We would like to know what your experience is in terms of residential customers being aware of multiple efficiency programs from multiple organizations. On a scale of 0-to-10 where 10 is "many aware of" and 0 is "none aware of", how would you rate customer awareness?
ENTER RATING 0 - 10
888. Don't Know
999. Refused

Q7. Are you familiar with what an AHRI certificate is?
(Yes)
(No)
888. Don't Know
999. Refused

[IF Q7=YES]
Q7a. Do you know where to find one?
(Yes)
(No)
888. Don't Know
999. Refused

Q8. Are you aware of the phone number on the program rebate application for the Nicor Gas support line for filling out applications?
(Yes)
(No)

888. Don't Know
999. Refused

[ASK IF Q8=YES]
Q8A. Have you used it?
(Yes)
(No)
888. Don't Know
999. Refused

[IF Q8A = 1]
Q8B. Was it helpful?
(Yes)
(No)
888. Don't Know
999. Refused

We have one final question for you.

Q9. Do you have any additional suggestions as to how Nicor Gas can improve its Home Energy Efficiency Rebate program? (Record verbatim.)
RECORD VERBATIM - CLARIFY AS NECESSARY
888. Don't Know
999. Refused

Thank you for your time.

5.6 Residential New Construction