NAVIGANT

Energy Efficiency / Demand Response
ComEd Plan Year 4
Nicor Gas Plan Year 1
North Shore Gas Plan Year 1
Peoples Gas Plan Year 1
(6/1/2011-5/31/2012)

Evaluation Report:
Complete System Replacement Program

FINAL

Presented to
Commonwealth Edison Company

June 6, 2013

Prepared by:
Randy Gunn
Managing Director
Navigant Consulting
30 S. Wacker Drive, Suite 3100
Chicago, IL 60606

Phone 312.583.5700
Fax 312.583.5701

www.navigant.com

© 2013 Navigant Consulting, Inc.

NAVIGANT

Submitted to:
ComEd
Three Lincoln Centre
Oakbrook Terrace, IL 60181

Submitted by:
Navigant Consulting, Inc.
30 S. Wacker Drive, Suite 3100
Chicago, IL 60606
Phone 312.583.5700
Fax 312.583.5701

Contact:
Randy Gunn, Managing Director
312.938.4242
randy.gunn@navigant.com

Jeff Erickson, Director
608.497.2322
jeff.erickson@navigant.com

Julianne Meurice
312.583.5740
julianne.meurice@navigant.com

Prepared by:
Katherine Wolf, Senior Consultant
Navigant Consulting
360.828.4013
katherine.wolf@navigant.com

Laura Tabor, Senior Consultant
Navigant Consulting
303.728.2470
laura.tabor@navigant.com

Disclaimer: This report was prepared by Navigant Consulting, Inc. ("Navigant") for ComEd based upon information provided by ComEd and from other sources. Use of this report by any other party for whatever purpose should not, and does not, absolve such party from using due diligence in verifying the report's contents. Neither Navigant nor any of its subsidiaries or affiliates assumes any liability or duty of care to such parties, and hereby disclaims any such liability.

NAVIGANT

Table of Contents

E. Executive Summary 1
- E.1 Evaluation Objectives 1
- E.2 Evaluation Methods 1
- E.3 Key Impact Findings and Recommendations 2
- E.4 Key Process Findings and Recommendations 4

1. Introduction to the Program 6
- 1.1 Program Description 6
  - 1.1.1 Implementation Strategy 6
  - 1.1.2 Measures and Incentives 6
- 1.2 Evaluation Questions 8
  - 1.2.1 Impact Issues 8
  - 1.2.2 Process Issues 8

2. Evaluation Methods 9
- 2.1 Primary Data Collection 9
- 2.2 Additional Research 10
  - 2.2.1 Verification and Due Diligence 10
  - 2.2.2 Tracking Systems 10
- 2.3 Impact Evaluation Methods 10
  - 2.3.1 Verification, Due Diligence and Tracking System Review Methods 10
  - 2.3.2 Gross Impact Analysis Methods 11

3. Evaluation Results 17
- 3.1 Impact Evaluation Results 17
  - 3.1.1 Verification and Due Diligence Procedure Review 17
  - 3.1.2 Tracking System Review 17
  - 3.1.3 Gross Program Impact Parameter Estimates 19
  - 3.1.4 Gross Program Impact Results 23
  - 3.1.5 Net Program Impact Parameter Estimates 24
  - 3.1.6 Net Program Impact Results 26
- 3.2 Process Evaluation Results 26
- 3.3 Non-Participant Survey Results 28

4. Findings and Recommendations 30
- 4.1 Key Impact Findings and Recommendations 30
- 4.2 Key Process Findings and Recommendations 31

5. Appendix 33
- 5.1 Glossary 33
- 5.2 Detailed Process Results 38
- 5.3 Detailed NTG Calculations 42
- 5.4 Data Collection Instruments 43
  - 5.4.1 Participant Survey 43
  - 5.4.2 Trade Ally Survey 63

NAVIGANT

List of Figures and Tables

Figures:

Figure 2-1. Baseline Logic Using Tracking Data 12
Figure 2-2. Baseline Logic Using Survey Data 14
Figure 2-3. Percent Replace-on-Burnout As Function of Cutoff Age 15
Figure 3-1. Energy Efficient Measures Installed Since Program Participation 25
Figure 3-2. SEER of Non-CSR Air Conditioning Units 28
Figure 5-1. Trade Ally Recommendations for Improvements 39
Figure 5-2. Reasons for Not Replacing Air Conditioning Units 40
Figure 5-3. SEER of Non-CSR Air Conditioning Units 41
Figure 5-4. Reasons for Not Choosing an Efficiency Air Conditioning Unit 42

Tables:

Table E-1. EPY4 Research Findings Savings Estimates 2
Table E-2. Gross and Net Research Savings by Gas Company 3
Table 1-1. Roles of organizations in Residential Rebate program operations 7
Table 1-2. Rebate Amounts for Eligible Equipment 7
Table 2-1. Data Collection Activities 9
Table 2-2. Definition of Parameters 11
Table 2-3. Default Values for Input Parameters 16
Table 2-4. FLHcool By Climate Zone and Dwelling Type 16
Table 3-1. Counts of Records with Missing or Invalid Data 18
Table 3-2. Average Gross Impact Parameters: Overall 19
Table 3-3. Average Gross Impact Parameters: ROB Units Only 19
Table 3-4. Average Gross Impact Parameters: ER Units Only 20
Table 3-5. Ex Ante Per Unit Savings by Dwelling Type and Implementer 20
Table 3-6. Unit Savings By Dwelling Type: All Data 20
Table 3-7. Number of Early Retirement and ROB Units 21
Table 3-8. Nicor Gas Ex Post Unit Savings by Dwelling Type and Baseline Condition 21
Table 3-9. People's Gas and North Shore Gas Ex Post Unit Savings by Dwelling Type and Baseline Condition 22
Table 3-10. Ex Ante and Ex Post Average Unit Savings by Utility and Baseline Condition 22
Table 3-11. Unit Savings for Known vs. Unknown Baseline SEER (Early Retirement Only) 22
Table 3-12. Unit Savings for Known vs. Unknown Efficient SEER 23
Table 3-13. Gross kWh Savings Estimates for GPY1/EPY4 CSR Program 23
Table 3-14. Gross Utility Peak kW Estimates for GPY1/EPY4 CSR Program 24
Table 3-15. CSR Participant Free-Ridership Results 24
Table 3-16. Participant Net-to-Gross Ratio 26
Table 3-17. Net Research Findings kWh Savings Estimates 26

E. Executive Summary

E.1 Evaluation Objectives

This report summarizes Navigant's third-party evaluation of ComEd's Complete System Replacement (CSR) Rebate program. The evaluation covered the program year ending May 31, 2012.

Navigant's work incorporated both a:

- Process evaluation— examining effectiveness of supporting processes; and,
- Impact evaluation—estimating the program's energy savings impact in total therms and kWh.

A primary objective of the detailed evaluation was to supply ComEd managers with an independent assessment of gross and net therm and kWh savings. 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.

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 CSR program offers education and cash incentives to ComEd's, Nicor Gas', North Shore Gas', and Peoples Gas' residential customers to encourage customer purchases of higher efficiency equipment in conjunction with Nicor Gas' Home Energy Efficiency Rebate (HEER) Program and North Shore Gas and Peoples Gas' Residential Prescriptive Rebate (RPR) Program. To be eligible for program rebates, customers must be active residential customers of ComEd and also of Nicor Gas, North Shore Gas, or Peoples. The premises must also be used for residential purposes in existing buildings. Qualified air conditioning units must be purchased at the same time as the qualifying furnaces. Both rental and owner-occupied dwellings are eligible for rebates for natural gas furnaces 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 sixty-nine 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. The CSR participants were taken from a subset of Nicor Gas (HEER) Program and North Shore Gas and Peoples Gas (RPR) Program participants.

Another twenty-two phone surveys were completed with HVAC installers, contractors and sales firms who participated as trade allies in the Nicor Gas HEER program, and thirty who participated in the North Shore Gas and Peoples Gas RPR 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 verify 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 Research Findings gross and net estimates.

Table E-1. EPY4 Research Findings Savings Estimates

	kWh Savings	kW Savings
Ex Ante Gross[1]	1,067,555	n/a
Ex Ante Net	629,857	n/a
Research Findings Gross	638,176	850
Research Findings Net	376,524	502

Source: Program tracking data and evaluation analysis

The following Table E-2 presents the verified gross kWh, the program realization rate, the calculated net-to-gross rate, and the verified net kWh. The NTG rate below is statistically significant at the program level, using a 90% confidence interval and 10% overall relative precision.

[1] Navigant calculated total ex ante gross savings by summing the unit savings in each implementer's tracking data. Since it was the first year for the program, data flow to the ComEd Frontier database was not fully synchronized and ComEd agreed that the implementer databases for EPY4 would be more accurate. These savings estimates exceeded ComEd's original planning ex ante values.

Table E-2. Gross and Net Research Savings by Gas Company

Gas Utility	Gross Ex Ante kWh*	Gross Realization Rate*	Gross Research kWh	NTGR	Net Research kWh
Nicor Gas	920,723	60%	553,072	0.59	326,312
People's Gas and North Shore Gas	146,832	58%	85,105	0.59	50,212
Total	1,067,555	60%	638,176	0.59	376,524

Source: Program tracking data and evaluation analysis

Navigant offers the following impact findings and recommendations for the program. In general, improved data tracking will greatly streamline the program and help achieve greater savings in the future. On average, Navigant's calculated kWh savings per unit were lower than the ex ante estimates in the program tracking data, although the total savings exceeded ComEd's planning estimates of 578 gross MWh and 364 net MWh by 110% and 103%, respectively. Navigant was not able to review detailed savings calculations supporting the unit kWh savings values in the tracking data, making the exact reasons for the gross research findings realization rate of 60% unclear. The net-to-gross ratio of 59% includes only free-ridership because spillover could not be quantified.

Finding: The two implementation contractors[2] have different unit kWh savings values assigned in their tracking data, and ComEd's database does not include any values for kWh savings.

- **Recommendation:** The program should establish a clear methodology for calculating unit kWh and kW savings and apply this methodology to all databases. This will increase the accuracy of ex ante savings estimates.

Finding: Data fields and validation are not consistent across the implementation contractors, and data does not flow consistently to the ComEd database.

- **Recommendation:** The program should standardize data tracking fields and an extract template for both implementers to use. In addition to standardizing which fields are included in what order, the content should have identical validation rules (e.g. operable or inoperable, or yes or no, but not both). This will improve data quality in the centralized ComEd database, which does not appear to be linked effectively to implementer systems.

Finding: While the program tracks replaced unit age and operability, it does not have a systematic way to identify unit baselines as early retirement or replace on burnout (ROB).

[2] Resource Solutions Group (RSG) implements the program for Nicor Gas and Franklin Energy implements the program for People's Gas and North Shore Gas.

- **Recommendation:** If the program would like to claim early retirement savings in the future, it should establish a clear methodology for determining which units can use an early retirement baseline. The logic provided in this report should serve as a good starting point.

Finding: Although the Nicor Gas tracking data contained capacity, seasonal energy efficiency ratio (SEER), age, and operability for nearly all units, the Peoples and North Shore tracking data lacked these fields and others for many units. The other data inconsistencies described also indicate that some data in the tracking system may be inaccurate.

- **Recommendation:** The program needs to improve the tracking of these key variables, and stands to gain from doing so. Tracking these variables more consistently will improve accuracy of savings estimates, and in the case of installed SEER could improve unit kWh savings by as much as 50 kWh if the installed unit efficiency exceeds the TRM default SEER of 14.5.

E.4 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 and with the incentives that the participants received. The primary reason that customers chose to participate in the program was to lower their energy bills. However, there is some perception that the application requirements are burdensome and complicated, and in North Shore Gas and Peoples Gas territory, the participants reported that they did not think they had been provided enough information about the program.

- **Recommendation:** Nicor Gas has taken steps to simplify and clarify the application, so Navigant will assess the success of the updated HEER/CSR application process in GPY2. Navigant also suggests that North Shore Gas and Peoples Gas work with trade allies to simplify the application procedure. Navigant also suggests that Nicor Gas expand the use of the "instant discount" feature, where trade allies can offer incentives directly to customers at the time of purchase, lowering the initial purchase price, and that North Shore Gas and Peoples Gas add an "instant discount" feature. The goal of the instant discount feature is to remove a sales impediment and assist trade allies in closing more deals.

Finding: The trade allies are the primary instruments of program promotion. The majority of participants in all service territories 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. There are opportunities for additional program promotion directly to customers and to provide more promotional literature to trade allies.

- **Recommendation:** ComEd, Nicor Gas, North Shore Gas, and Peoples Gas should work with trade allies to develop promotional literature that can be used by trade allies to promote the program to their customers, both at the time of purchase and before. Additional literature, especially that which contains information about equipment payback, will help trade allies to explain the benefits of higher efficiency measures to their customers.

Finding: If trade allies are to remain one of the primary methods of program promotion, then it is important to maintain their support and participation. This is especially true in North Shore Gas and Peoples Gas territory because these utilities are not currently promoting the program directly to customers and therefore are more dependent of the efforts of the trade allies.

- **Recommendation**: Given the trade allies important role in the CSR process, Navigant suggests that the utilities create an additional incentive or recognition for the trade allies who participate in the program; possibly creating a sales award program for top trade allies. This will help the program retain participating trade allies and will additionally help to increase "good will" toward the utilities and their programs.

Finding: Throughout the evaluation process, Navigant experienced some challenges with regards to trade ally participation in the evaluation surveys.

- **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 to speak with Navigant. One suggested approach is to require trade allies to participate in the program evaluation as a condition of program participation.

1. Introduction to the Program

1.1 Program Description

Under the Complete System Replacement (CSR) Program, in conjunction with Nicor Gas' Home Energy Efficiency Rebate (HEER) Program and North Shore Gas and Peoples Gas Residential Prescriptive Rebate (RPR) Program, cash incentives and education were offered to encourage upgrading of air conditioning systems for ComEd customers. The CSR program ran from January 1, 2012 through May 31, 2012. The CSR program was designed to conserve electricity, and lower participant monthly energy bills. Both rental and owner-occupied dwellings are eligible for rebates for air conditioning systems when purchased and installed at the same time as a HEER or RPR program qualified high-efficiency furnace. Customers must be active residential customers of ComEd, and Nicor Gas, North Shore Gas, or Peoples Gas, in order to receive rebates for high efficiency furnaces and air conditioning systems under the CSR program, and the premises must be used for residential purposes in existing buildings.

The CSR 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 and air conditioning systems – the rebate for the air conditioning system is contingent on the customer also purchasing a furnace; however, a furnace rebate can be obtained from the gas companies without purchasing an air conditioning unit. The dollar amount of the rebate depends on the size and fuel efficiency of the replacement measures.

1.1.1 Implementation Strategy

The field organization that delivered the CSR program to ComEd customers included long-established firms in the energy efficiency services sector. Administration of the HEER program, on behalf of Nicor Gas, 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 1-1). 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. Program implementation of the RPR program, on behalf of North Shore Gas and Peoples Gas is managed by Franklin Energy. Franklin Energy's assigned tasks specifically included promotion, sales assistance and rebate processing. This includes the majority of the trade ally outreach, and trade ally management. The trade ally firms participated in the program were instrumental in both promoting the program to their customers and installing the rebated measures.

More than 2,000 trade ally firms participated in the program, both promoting the program to their customers and installing the rebated measures.

1.1.2 Measures and Incentives

Two types of central air conditioning systems were eligible for rebates as part of the CSR program. Two tiers of high efficiency furnaces were eligible for rebates through the gas rebate programs from the gas

utilities. While the central air conditioning equipment rebates did not change depending on the program implementer, the furnace rebates did. Equipment types and rebate amounts for GPY4 are in Table 1-2 below.

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

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

Source: Program documents

Table 1-2. Rebate Amounts for Eligible Equipment

Equipment	Rebate Amount
Central Air Conditioning System SEER ≥ 14.5	$400
High Efficiency Furnace – Nicor HEER Program AFUE[3] ≥ 92%	$200
High Efficiency Furnace – North Shore Gas RPR Program AFUE ≥ 92%	$200
High Efficiency Furnace – Peoples Gas RPR Program AFUE ≥ 92%	$350
High Efficiency Furnace – Nicor HEER Program AFUE ≥ 95%	$250
High Efficiency Furnace – North Shore Gas RPR Program AFUE ≥ 95%	$250
High Efficiency Furnace – Peoples Gas RPR Program AFUE ≥ 95%	$400

Source: Nicor HEER Program Application, North Shore Gas and Peoples Gas RPR Program Application

[3] Annual Fuel Utilization Efficiency

1.2 *Evaluation Questions*

The objectives of the PY4 CSR program evaluation were to (1) quantify gross and 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 PY4 evaluation sought to answer the following researchable issues:

1.2.1 Impact Issues

1. What is the level of gross annual therm and kWh savings achieved by the program?
2. What were the realization rates? (Defined as Research Findings 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 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 Complete System Replacement Rebate program. The section 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 savings algorithms and program tracking information. The process evaluation included a review of the effectiveness of the program's administration and delivery.

Navigant's evaluation of ComEd's CSR program also included a survey of trade allies to obtain deeper information about how the program was working for the trade allies, the 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	32 Nicor Gas 18 North Shore Gas 19 Peoples Gas	X	X	X
Telephone Survey	Non-Participants	130			X
In-Depth Interviews	Program administrators and implementation contractor staff	4			X
Telephone Surveys	HVAC Contractors	22 HEER, 15 North Shore Gas RPR, 15 Peoples Gas RPR		X	X
Energy Savings Review	Energy savings estimates	All	X		

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

Navigant also completed twenty-three Nicor Gas HEER program and thirty North Shore Gas and Peoples Gas RPR program trade ally surveys.

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 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; and
- 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 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. 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*

This section describes the methods used in each piece of the impact evaluation.

2.3.1 Verification, Due Diligence and Tracking System Review Methods

In addition to providing Research Findings 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. Navigant reviewed the following tracking databases:

- Nicor Gas joint database extract, provided by Resource Solutions Group (RSG)
- People's Gas and North Shore Gas joint database extract, provided by Franklin Energy
- ComEd Frontier database extract, provided by ComEd

Navigant compared these databases to determine whether data from the implementation teams (RSG and Franklin) aligned with the final data compiled by ComEd in the Frontier system. Navigant also reviewed the contents of each database for missing and invalid data and ensure that all necessary data is being tracked.

2.3.2 Gross Impact Analysis Methods

Navigant calculated independent estimates of the savings for the single program measure, Central Air Conditioner replacement, based on the Illinois TRM (IL TRM). The TRM algorithm is as follows:

$$\Delta kWh = (FLHcool * BtuH * (1/SEERbase - 1/SEERee))/1000$$

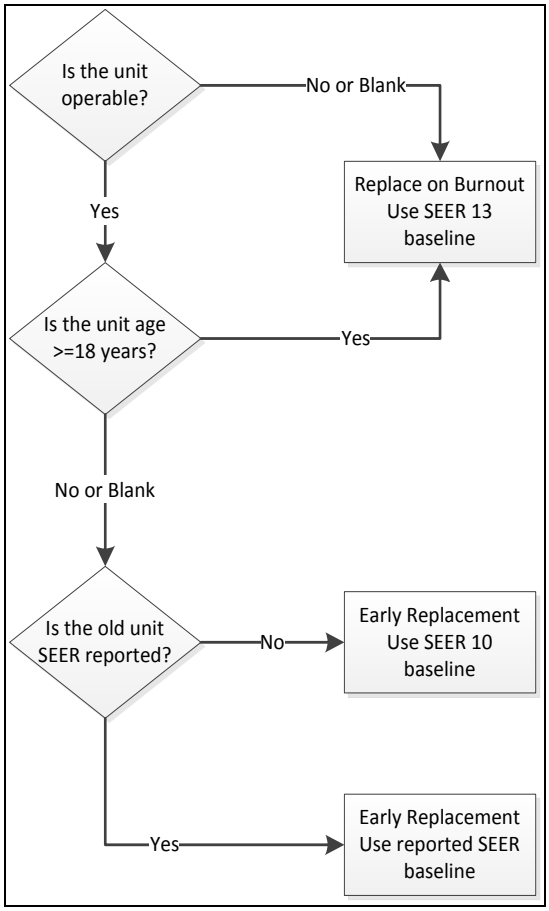
Table 2-2 defines each of the parameters in the algorithm. Navigant used tracking data where possible, but in cases where data was missing, the evaluation team defaulted to inputs prescribed by the TRM.

Table 2-2. Definition of Parameters

Parameter	Definition	Navigant Source
FLHcool	Cooling Full Load Hours	Illinois TRM
BtuH	Capacity of the installed unit (BtuH)	Tracking data; Default as specified in TRM
SEERbase	Baseline efficiency	Tracking data; Default as specified in TRM
SEERee	Installed efficiency	Tracking data; Default as specified in TRM

Due to the nature of this joint program, implementers tracked replaced unit age and operability to see if some air conditioners were replaced early, potentially spurred by a broken down furnace. While the program tracking data captured related data it did not have a flag to distinguish between replace on burnout or early replacement installations. As a result, Navigant performed its own assessment of ROB or early replacement. Navigant used the logic shown in Figure 2-1 to estimate whether each unit should have a replace-on-burnout (ROB) baseline or an early retirement (ER) baseline.

Figure 2-1. Baseline Logic Using Tracking Data



Source: Navigant analysis

To support the choice of an age threshold to define early retirement, Navigant compared the tracking data analysis to survey responses from 69 CSR participants to provide another estimate of what portion of units are ROB versus ER. Navigant used five survey questions to determine if the replacement was due to replace on burnout or early retirement (*this is described in more detail in the Appendix 5.4.1*):

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)

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)

FR1. At the time that you first heard about this program, had you already been thinking about purchasing a new air conditioner for this property?
1. (Yes)
2. (No)
888. (Don't know)
999. (Refused)

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?
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 [RECORD VERBATIM]
888. Don't Know
999. Refused

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

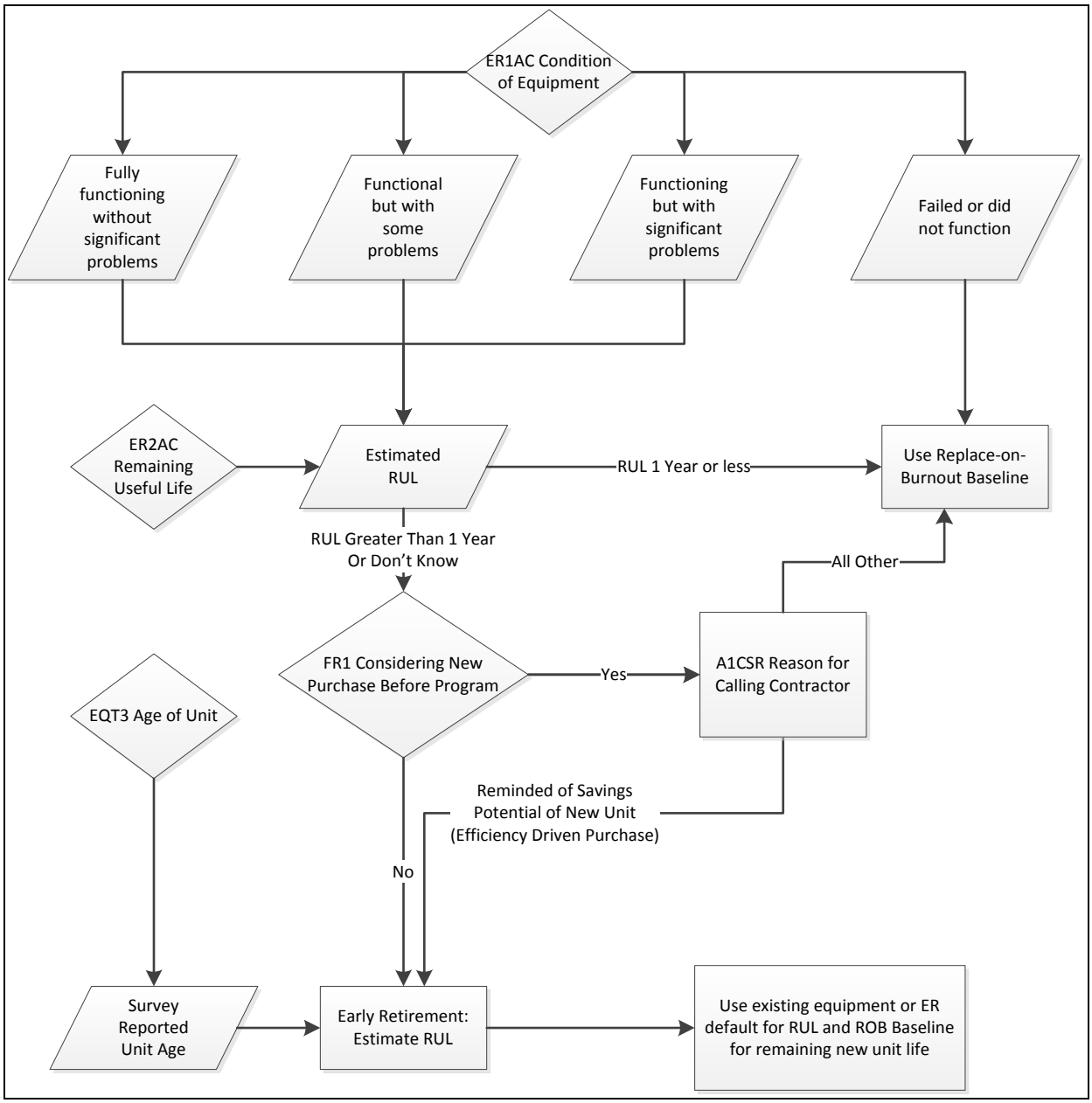
Figure 2-2 illustrates the following steps that Navigant used to determine the baseline:

1. If respondents indicated that their air conditioner had failed or did not function (ER1AC), Navigant assigned a replace-on-burnout baseline.
2. Respondents who indicated functional equipment in ER1AC but who indicated one year or less of remaining useful life (ER2AC) were also assumed replace-on-burnout.
3. For the remaining respondents, Navigant turned to question FR1. If participants had not been considering replacing their air conditioner at all before hearing about the program, Navigant assumed that the program initiated their decision to replace their air conditioner and assigned an early retirement baseline.[4]

[4] This question is also used in the free-ridership analysis to establish zero free-ridership for participants who were not considering replacing their equipment before hearing about the program.

4. If participants were considering replacing their equipment before they had heard about the program, Navigant assumed a replace-on-burnout baseline, with one exception: if participants indicated that they called their contractors initially with the intent of installing high-efficiency equipment (A1CSR). Navigant considers these participants early-retirement because their purchase decision was driven by a desire for greater efficiency and not the condition of their existing equipment.

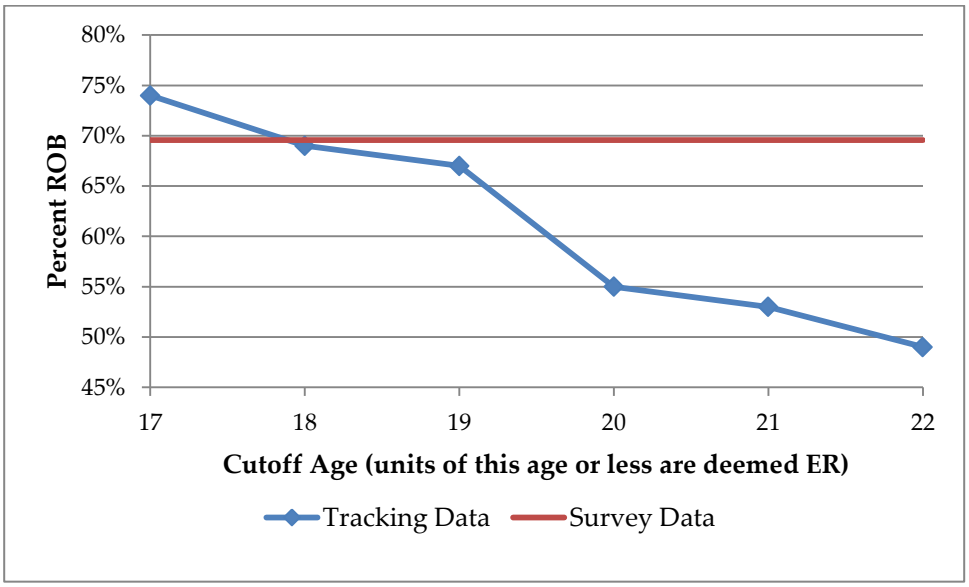
Figure 2-2. Baseline Logic Using Survey Data



Source: Navigant Analysis

Navigant compared the percent of units that appeared to be ROB at various cutoff ages based on tracking data to the percent ROB calculated from the survey data. This comparison, which only includes units where operability was reported, is shown in Figure 2-3. The survey data percentage of 70% was closest to the tracking data when we set the cutoff age to 18 years. This means that in order to be consistent with the survey data, we must assume all units greater than 18 years of age (19 years or older) are ROB. Note that as a result of estimated ages trending towards round numbers, there is a sharp drop in the tracking data percentage once 20 year old units are considered for early retirement.

Figure 2-3. Percent Replace-on-Burnout As Function of Cutoff Age



Source: Navigant analysis

Table 2-3 and Table 2-4 show the default inputs that Navigant used in the analysis when tracking data was not available.

Table 2-3. Default Values for Input Parameters

Parameter	Value	Source
Default FLH_{cool}	See Table 2-4	Illinois TRM
Default $SEER_{base}$ (ROB)	13.0	Illinois TRM
Default $SEER_{base}$ (ER)	10.0	Illinois TRM
ER Age Cutoff	18	Engineering judgment supported by survey data
Default $SEER_{ee}$	14.5	Illinois TRM
Default BtuH	33,600	Illinois TRM (for Single-Family)
Utility Coincidence Factor	91.5%	Illinois TRM
PJM Coincidence Factor	46.6%	Illinois TRM

Table 2-4. FLHcool By Climate Zone and Dwelling Type

Climate Zone	Single Family FLHcool	Multi Family FLHcool	Unknown Dwelling FLHcool
1	512	467	512
2	570	506	570
3	730	663	730
4	1035	940	1035
5	903	820	903

Source: Illinois TRM for SF and MF, Navigant analysis for unknown based on percentage of each in program data.

3. Evaluation Results

3.1 *Impact Evaluation Results*

3.1.1 Verification and Due Diligence Procedure Review

Navigant reviewed the verification and due diligence procedures for each of the implementers. For detailed discussions of these reviews, please see the Nicor Gas Home Energy Efficiency Program GPY1 Evaluation Report and North Shore Gas and Peoples Gas Residential Prescriptive Rebate Program GPY1 Evaluation Report.

3.1.2 Tracking System Review

Navigant also reviewed the data tracking systems used by the program and found that this is a key area where the program needs improvement. Navigant offers the following detailed findings and recommendations with regard to the tracking system.

Finding: Both implementers maintain databases and provide CSR extracts for ComEd. While the fields tracked by the two implementers are similar, they are not identical. Furthermore, the two databases do not use the same formatting or data entry conventions. These inconsistencies make it difficult to aggregate the data for all electric units. Some examples include:

- The Nicor Gas database has separate fields for "First Name" and "Last Name," and the North Shore Gas and Peoples Gas database has a single field for "Name" which includes first and last name.
- The Nicor Gas database uses the codes "O" or "B" to indicate whether a unit is "operable" or "broken" whereas the North Shore Gas and Peoples Gas database uses "Yes" or "No" to indicate operability.
- The two databases contain different per unit kWh savings values for rebated units.

- **Recommendation.** The program should standardize data tracking fields and an extract template for both implementers to use. In addition to standardizing fields, the content should have identical validation rules (e.g. operable or inoperable, or yes or no, *but not both*). This will improve data quality in the centralized ComEd database.

Finding: ComEd also maintains a database to contain data on all electric units. However, Navigant was not able to match all units in the implementer databases to units in the ComEd database, indicating that there is a disconnect in the data flow from the implementers to ComEd.

- **Recommendation.** ComEd should work with the implementation contractors to ensure that all data flows automatically to the ComEd database.

Finding: The evaluation found significant issues with the completeness and accuracy of the program tracking data. Navigant reviewed both implementers' databases for missing and invalid data in key fields.

Table 3-1 summarizes the number of records in each database missing entries for capacity, SEER, dwelling type, AHRI reference number, model number and serial number. Capacity, SEER and dwelling type are all inputs to impact calculations. AHRI number and model number should be used to validate the entries for capacity and SEER, and serial number should be used to ensure that the program does not issue any duplicate rebates. The Nicor Gas dataset was generally more complete, although it contained more "invalid" entries such as multiple AHRI numbers in the same field or model or serial numbers containing the text "NOTPROVIDED." The North Shore Gas and Peoples Gas dataset had fewer "invalid" entries but was missing data for key fields for the majority of records. Navigant also observed that in many cases the old unit AHRI reference number and new unit AHRI reference number were identical, which is not possible. These inconsistencies call into question the quality of the data recorded.

Table 3-1. Counts of Records with Missing or Invalid Data

Implementer		Capacity	SEER	Dwelling Type	AHRI	Model Number	Serial Number
Nicor Gas (1678 units)	Missing	4	3	15	3	0	0
	Invalid	6	4	0	7	2	4
North Shore Gas and Peoples Gas (377 units)	Missing	201	202	218	203	201	340
	Invalid	8	4	0	0	0	0

Source: Navigant analysis

- **Recommendation.** The program needs to improve the tracking of these key variables, and stands to gain from doing so. Tracking these variables more consistently will improve accuracy of savings estimates, and in the case of installed SEER could improve savings if the installed unit efficiency exceeds the TRM default SEER of 14.5.

Finding. There is no field in the data that indicates which program year a unit belongs to. Creating such a field would greatly simplify the process of extracting the correct projects for a given year. **Recommendation.** The tracking database should contain an indicator field which specifies where each unit's costs and savings should be attributed.

Finding: The implementation contractors and ComEd are not consistent in whether a unique rebate ID is assigned to a single participant or a single unit (some participants could have more than one unit installed).

- **Recommendation:** The program needs to reconcile whether a unique rebate ID is assigned to each participant or each unit. If rebate ID is only unique to the participant, the program needs to create another database field to serve as the unique identifier for each unit. Since the program is tracking detailed information on every unit, every unit must have a unique identifier.

3.1.3 Gross Program Impact Parameter Estimates

This section discusses the algorithms and input parameters used in the impact calculations for each measure. The program rebates central air conditioners sold in conjunction with high efficiency furnaces. For details on the gas savings through the programs, Nicor Gas Home Energy Efficiency Program GPY1 Evaluation Report and North Shore Gas and Peoples Gas Residential Prescriptive Rebate Program GPY1 Evaluation Report.

As stated in the impact methodology section, Navigant used the following algorithm from the Illinois TRM to estimate gross savings from central air conditioner replacements:

$$\Delta kWh = (FLHcool * BtuH * (1/SEERbase - 1/SEERee))/1000$$

Navigant was unable to obtain detailed calculations for ComEd's ex ante savings values, and thus could not compare each input parameter to ex ante values. Navigant's average values for each parameter are presented in Table 3-2 (all units in program, ROB and ER combined), Table 3-3 (ROB units only) and Table 3-4 (ER units only).

Table 3-2. Average Gross Impact Parameters: Overall

	Single-Family	Multi-Family	Unknown	Source
SEERbase	12.3	12.3	12.7	Average of Participants
SEERee	15.1	15.1	14.8	Average of Participants
FLHcool	555	503	569	Illinois TRM
BtuH	34,841	30,126	34,853	Average of Participants

Table 3-3. Average Gross Impact Parameters: ROB Units Only

	Single-Family	Multi-Family	Unknown	Source
SEERbase	13.0	13.0	13.0	Average of Participants
SEERee	15.1	15.1	14.8	Average of Participants
FLHcool	556	504	570	Illinois TRM
BtuH	34,376	28,988	34,602	Average of Participants

Table 3-4. Average Gross Impact Parameters: ER Units Only

	Single-Family	Multi-Family	Unknown	Source
SEERbase	10.0	9.8	10.2	Average of Participants
SEERee	15.2	15.2	15.0	Average of Participants
FLHcool	554	500	568	Illinois TRM
BtuH	36,527	35,388	36,708	Average of Participants

Table 3-5 shows the unit savings each implementer used in the tracking data by dwelling type. Although the Nicor Gas data tracked at a more specific level, the North Shore Gas and Peoples Gas data only tracked single-family versus multi-family. Neither implementer adjusted savings estimates based on operability or age of the existing unit, indicating that the program did not attempt to differentiate between ER and ROB units in the ex ante estimates. Table 3-5 shows the average kWh savings per unit by dwelling type for both the tracking data and Research Findings.

Table 3-5. Ex Ante Per Unit Savings by Dwelling Type and Implementer

Dwelling Type	Nicor Gas Tracking Estimate	North Shore Gas and Peoples Gas Estimate
Single Family Detached	587	368
Single Family Attached	500	
Manufactured	154	
Multifamily	600	
Undefined	500	

Source: RSG and Franklin Energy data extracts

Table 3-6. Unit Savings By Dwelling Type: All Data

Dwelling Type	Units	Average Ex Ante kWh per Unit (same for ER and ROB)	Research Findings kWh per Unit, ROB	Research Findings kWh per Unit, ER	Research Findings Average kWh per Unit
Single-Family	1,798	536	200	696	321
Multi-Family	23	455	153	636	258
Unknown	233	403	183	671	237
Total	2,054	520	197	694	311

Source: Navigant analysis

Table 3-7 shows the number of early retirement and ROB units in the tracking data based on Navigant's analysis. Of the units with a known operability, Navigant classified 69% as replace-on-burnout using the steps in Figure 2-1 For units where the operability was not reported, Navigant assumed replace-on-burnout, bringing the total percent of ROB units in the database to 73%. This assumption only affected units in the People's Gas and North Shore Gas database, where 65% of the units did not have a reported operability.

Table 3-7. Number of Early Retirement and ROB Units

Condition	Nicor Gas		People's Gas and North Shore Gas		All	
	Count	Percent	Count	Percent	Count	Percent
Operable, ER	523	31%	42	11%	565	28%
Operable, ROB	644	38%	53	14%	697	34%
Inoperable (ROB)	510	30%	38	10%	548	27%
Unknown (ROB)	0	0%	244	65%	244	12%
All	1,677	100%	377	100%	2,054	100%

Source: Navigant analysis

Table 3-6 and Table 3-9 show the number of units in each utility by baseline type (ROB or ER), as well as the average unit savings for each category. The main factor driving the unit savings difference between the ROB and ER units is the different in baseline SEER.

Table 3-8. Nicor Gas Ex Post Unit Savings by Dwelling Type and Baseline Condition

Dwelling Type	ROB Units	ROB Unit kWh	ER Units	ER Unit kWh	Total Units	Average Unit kWh
Single-Family	1,229	204	426	694	1,655	330
Multi-Family	5	122	2	353	7	188
Unknown	11	208	4	682	15	335
Total	1,245	204	432	692	1,677	330

Source: Navigant analysis

Table 3-9. People's Gas and North Shore Gas Ex Post Unit Savings by Dwelling Type and Baseline Condition

Dwelling Type	ROB Units	ROB Unit kWh	ER Units	ER Unit kWh	Total Units	Average Unit kWh
Single-Family	1,360	200	438	696	1,798	321
Multi-Family	18	153	5	636	23	258
Unknown	207	183	26	671	233	237
Total	1,585	197	469	694	2,054	311

Source: Navigant analysis

Table 3-10. Ex Ante and Ex Post Average Unit Savings by Utility and Baseline Condition

Utility	ROB		ER		All	
	Ex Ante	Ex Post	Ex Ante	Ex Post	Ex Ante	Ex Post
Nicor Gas	549	204	549	692	549	330
People's Gas and North Shore Gas	389	173	389	707	389	226
Program	520	197	520	694	520	311

Source: Navigant analysis

Missing data in the old and new unit SEER fields also affected the final results. For early retirement units, Navigant used a default baseline of 10.0 when the actual value was not reported. For all units, when the tracking data did not contain a valid new unit SEER, Navigant assigned a default value of 14.5. The Illinois TRM specifies both these values. The TRM assumptions are reasonable as defaults, but since the TRM allows for custom inputs the programs should take advantage and track these inputs as much as it can. As shown in Table 3-11 and Table 3-12, the program stands to claim additional savings by consistently tracking new and old unit SEER.

Table 3-11. Unit Savings for Known vs. Unknown Baseline SEER (Early Retirement Only)

Baseline	kWh per Unit	Delta kWh per unit
Baseline SEER known	718	37
Baseline SEER unknown	681	

Source: Navigant analysis

Table 3-12. Unit Savings for Known vs. Unknown Efficient SEER

Baseline	New SEER Known	New SEER Unknown	Delta kWh per unit
ROB	204	152	53
Early Retirement*	694	626	68

**Also includes effects of baseline SEER*
Source: Navigant analysis

3.1.4 Gross Program Impact Results

Table 3-13 and Table 3-14 show the overall gross kWh savings for each gas utility implementer for the GPY1/EPY4 CSR program. Gross kWh estimates are compared to implementer tracking data estimates. Neither implementer estimated demand savings so only Research Findings values are shown. The gross realization rate was calculated as:

$$RR = \frac{Research\ Findings\ Gross\ kWh}{Gross\ Ex\ Ante\ kWh}$$

The gross Ex Ante kWh was calculated as the sum of the tracking database kWh. Additional detail on the calculation of gross Ex Post savings can be found in sections 2.3.2 and 3.1.3.

Table 3-13. Gross kWh Savings Estimates for GPY1/EPY4 CSR Program

Gas Utility	Gross Ex Ante kWh*	Gross Realization Rate*	Research Findings Gross kWh
Nicor Gas	920,723	60%	553,072
People's Gas and North Shore Gas	146,832	58%	85,105
Total	1,067,555	60%	638,176

**Based on implementer tracking data*
Source: Navigant analysis

Table 3-14. Gross Utility Peak kW Estimates for GPY1/EPY4 CSR Program

Gas Utility	Research Findings Gross Peak kW
Nicor Gas	740
People's Gas and North Shore Gas	110
Total	850

Source: Navigant analysis

3.1.5 Net Program Impact Parameter Estimates

3.1.5.1 Free Ridership

Free ridership 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 ComEd CSR program, free ridership questions were asked of each of the participating customers surveyed, as well as of the participating trade allies surveyed. The intent was to develop a combined NTGR using both information sources.

At the time Navigant planned the team's trade ally survey, the program data was not available and Navigant planned to survey 15 trade allies per gas utility. The team subsequently learned that the program participants relied on over 2,000 trade allies, and there was little concentration of program activity in a small number of trade allies. Consequently, the trade allies Navigant reached accounted for less than 5% of program savings, a level inadequate in Navigant's opinion to include in the NTGR estimation process.

As Navigant's trade ally research plans did not cover an adequate sample to represent program influence, Navigant's NTG estimate for GPY1 reflects only participant feedback. GPY2 research will be designed to cover adequate trade ally input. A detailed explanation of the methodology used to calculate free ridership and spillover may be found in Appendix 5.3.

Navigant's participant sample was designed to obtain appropriate precision and confidence at the program level. The participants were then stratified by gas utility to mirror each utilities' share of CSR program savings. Free-ridership was averaged across all respondents to calculate the Net-to-Gross ratio. The overall program FR rate is shown in Table 3-15.

Table 3-15. CSR Participant Free-Ridership Results

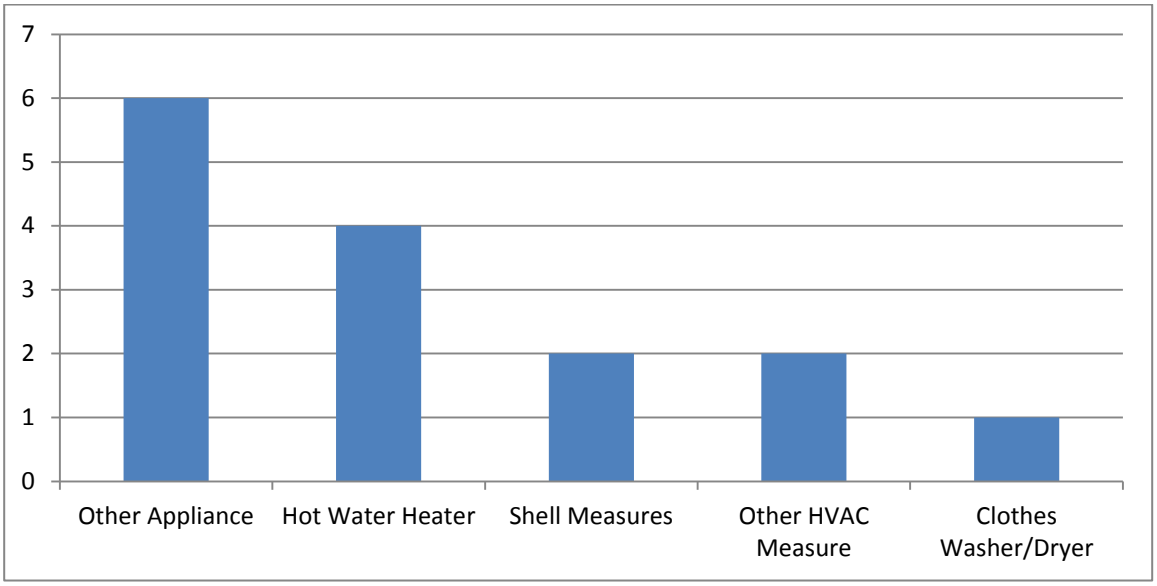
Free-ridership	Number of Participants Surveyed
0.41	**69**

Source: Navigant analysis

3.1.5.2 Spillover

To get an indication of whether spillover is happening, program participants were asked if they had purchased and installed any additional energy efficiency measures since their participation in the program. Fifteen of the respondents stated that they had installed additional energy efficiency measures, with energy efficient appliances being the most common, followed by hot water heaters. There does not appear to be any like measure spillover (installation of the same kind of measure included in the program), which is to be expected given the nature of the program. Figure 3-1 presents the distribution of additional energy efficiency measures installed. Only one respondent reported that they received a rebate for the additional energy efficient measure that they installed. These participants were also asked if their participation in the CSR program had any influence on their decision to install the additional energy efficiency measures. The majority reported that the program had no effect. Given the nature of the research and the modest response, no attempt was made to quantify participant spillover.

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



Source: Participant survey

3.1.5.3 Final Net to Gross Ratio

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

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

or,

$$0.59 = 1 - 0.41 + 0$$

Table 3-16 presents the NTGR for ComEd. The following results are statistically significant at the program level, using a 90% confidence interval, and 10% overall relative precision.

Table 3-16. Participant Net-to-Gross Ratio

Average NTGR
0.59

Source: Navigant analysis

3.1.6 Net Program Impact Results

Table 3-17 shows the Research Findings net kWh savings for the CSR program.

Table 3-17. Net Research Findings kWh Savings Estimates

Measure	Research Findings Gross Energy Savings (kWh)	NTGR	Research Findings Net Energy Savings (kWh)
Program Total	638,176	0.59	376,524

Source: Navigant Analysis

3.2 *Process Evaluation Results*

This section discusses the process results obtained from the program participant and trade ally interviews. CSR specific trade ally survey results can be found in Appendix 5.2.

- The majority of customers in all gas service territories were first made aware of the program through their contractors. However, HEER participants were also made aware of the program through Nicor Gas bill inserts (14%) and the internet, including the Nicor Gas website. The North Shore and Peoples Gas implementation contractor did not directly promote the RPR program to end users, but instead relied upon trade allies to promote the program and its incentives directly to their customers, mostly at the point of sale. This suggests that in North Shore Gas and Peoples Gas territory there are additional opportunities to promote the program directly to customers, through methods such as bill inserts and direct mailings. Increasing customer awareness can also increase the number of participating trade allies, as customers make their contractors aware of the program.

- When asked about potential barriers to participation, the main barrier cited by both the participants and the trade allies was the perceived burdensome nature of the applications process, followed by the program itself being too complicated. Several trade allies also expressed that they are providing large amounts of assistance to program participants to ensure that their applications are processed correctly, because they feel that the program and application process are too complicated for their customers. Navigant suggests that steps be taken to simplify the

application process, and that additional application support be provided to customers, to help alleviate the additional work done by trade allies.

- 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 ComEd offers rebates on new air conditioning units, 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 would be beneficial to provide additional promotional materials to trade allies, including payback calculation charts.

- The role of the trade ally in the CSR 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 the utilities and implementation firms consider implementing either a form of recognition for the participating trade allies. Recognition of 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.

- A very large majority (91%) of HEER and RPR program trade allies reported that they were aware of the CSR component of the programs, and over half reported that they had participated in the program. All of the trade allies who participated in the CSR program had sold both the heating and the air conditioning units. Slightly over half of the trade allies interviewed stated that the combined rebate had a positive effect on their ability to market and sell energy efficient measures to customers, and many reported that the additional rebate encouraged customers to replace both their heating and cooling systems at the same time, and to spend more on the high efficiency systems than they would have otherwise.

- The trade allies reported that many of their customers are replacing their air conditioning units at the same time as their furnaces outside of the CSR program; and that the typical SEER of the new units was a 13. This suggests that there is additional room for the CSR program to expand and increase the adoption of higher efficiency units.

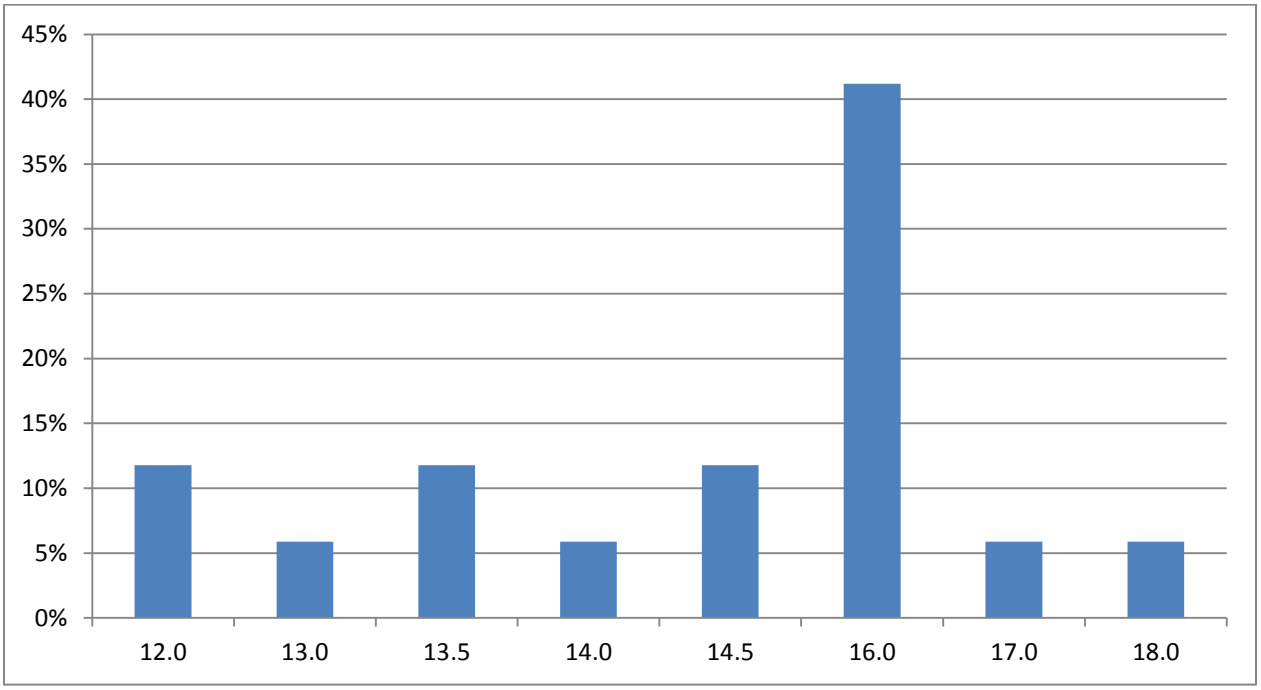
- The program design and processes have been found to be quite successful in helping to achieve the program's goals. Both the trade allies and the customers report high levels of satisfaction with the program. Overall, the customers reported that their experiences with the program were very positive. The area with lower levels of satisfaction was the speed at which customers received their rebates. To increase customer satisfaction in this area, North Shore Gas and Peoples Gas should consider adopting the use of an "instant discount" feature, where trade allies can offer incentives directly to customers at the time of purchase, lowering the initial purchase price, and Nicor Gas should consider expanding the use of their "instant discount".

3.3 *Non-Participant Survey Results*

This section discusses the process results obtained from the HEER and RPR furnace participants who did not participate in the CSR program, that is participants who purchased and received rebates for efficient furnaces, but did not also purchase and receive a rebate for a CSR qualified air conditioning unit. Navigant completed surveys with 130 non-participant respondents. Navigant did not ask non-CSR participants about their knowledge of the CSR program or rebates for air conditioning units.
When asked if they considered replacing their air conditioning units when they replaced their furnaces, most participants (42%) said they had not considered replacing their units. However, 40% of non-CSR participants reported that they did replace their air conditioning units. A small portion of participants (15%) considered replacing their air conditioning units, but decided against replacing them.

The non-CSR participants who reported that they did replace their air conditioning unit at the same time that they replaced their furnace were then asked if they knew the SEER rating of their new air conditioning units. Approximately 35% of respondents (n=17)_were able to report the SEER of their new air conditioning unit. Figure 3-2 presents the percentage of air conditioning units purchased outside of the CSR program by SEER.

Figure 3-2. SEER of Non-CSR Air Conditioning Units



Source: Participant survey

When those respondents who purchased an air conditioning unit with a SEER of less than 14.5 were asked why they did not purchase an energy efficient unit (i.e. 14.5 SEER or greater), nearly all said the energy efficient unit was too expensive, and only one respondent said they weren't aware of the availability of energy efficiency units.

The HEER and RPR program participants who replaced their furnaces but did not also replace their air conditioning units were asked if their furnace contractors discussed with them the possibility of replacing their air conditioning units at the same time as their furnaces. The majority of contractors (55%) did discuss also replacing the air conditioning units. When asked why they did not replace their air conditioning units at the same time as their furnaces, 60% stated that it was too expensive for them to do so.

The results of the non-CSR participant survey suggest that there are air conditioning units being installed at the same time as furnaces outside of the program, including high efficiency air conditioning units; however, replacing an air conditioning unit represents an additional significant cost, there is opportunity for the CSR program to increase the early replacement of air conditioning units and the adoption of high efficiency air conditioning units by continuing to provide rebates.

4. Findings and Recommendations

4.1 *Key Impact Findings and Recommendations*

Navigant offers the following impact findings and recommendations for the program. In general, improved data tracking will greatly streamline the program and help achieve greater savings in the future. On average, Navigant's calculated kWh savings per unit were lower than the ex ante estimates. Navigant was not able to review detailed savings calculations supporting the unit kWh savings values in the tracking data, making the exact reasons for the gross research findings realization rate of 60% unclear. The net-to-gross ratio of 59% includes only free-ridership because spillover could not be quantified.

Finding: The two implementation contractors[5] have different unit kWh savings values assigned in their tracking data, and ComEd's database does not include any values for kWh savings.

- **Recommendation:** The program should establish a clear methodology for calculating unit kWh and kW savings and apply this methodology to all databases. This will increase the accuracy of ex ante savings estimates.

Finding: Data fields and validation are not consistent across the implementation contractors, and data does not flow consistently to the ComEd database.

- **Recommendation:** The program should standardize data tracking fields and an extract template for both implementers to use. In addition to standardizing which fields are included in what order, the content should have identical validation rules (e.g. operable or inoperable, or yes or no, but not both). This will improve data quality in the centralized ComEd database, which does not appear to be linked effectively to implementer systems.

Finding: While the program tracks replaced unit age and operability, it does not have a systematic way to identify unit baselines as early retirement or replace on burnout (ROB).

- **Recommendation:** If the program would like to claim early retirement savings in the future, it should establish a clear methodology for determining which units can use an early retirement baseline. The logic provided in this report should serve as a good starting point.

Finding: Although the Nicor Gas tracking data contained capacity, seasonal energy efficiency ratio (SEER), age, and operability for nearly all units, the Peoples and North Shore tracking data lacked these fields and others for many units. The other data inconsistencies described also indicate that some data in the tracking system may be inaccurate.

[5] Resource Solutions Group (RSG) implements the program for Nicor Gas and Franklin Energy implements the program for People's Gas and North Shore Gas.

- **Recommendation:** The program needs to improve the tracking of these key variables, and stands to gain from doing so. Tracking these variables more consistently will improve accuracy of savings estimates, and in the case of installed SEER could improve unit kWh savings by as much as 50 kWh if the installed unit efficiency exceeds the TRM default SEER of 14.5.

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 and with the incentives that the participants received. The primary reason that customers chose to participate in the program was to lower their energy bills. However, there is still some perception that the application requirements are burdensome and complicated, and in North Shore Gas and Peoples Gas territory, the participants reported that they did not think they had been provided enough information about the program.

- **Recommendation:** Nicor Gas has taken steps to simplify and clarify the application, so Navigant will assess the success of the updated HEER application process in GPY2. Navigant also suggests that North Shore Gas and Peoples Gas work with trade allies to simplify the application procedure. Navigant also suggests that Nicor Gas expanding the use of the "instant discount" feature, where trade allies can offer incentives directly to customers at the time of purchase, lowering the initial purchase price, and that North Shore and Peoples Gas add an "instant discount" feature. The goal of the instant discount feature is to remove a sales impediment and assist trade allies in closing more deals.

Finding: The trade allies are the primary instruments of program promotion. The majority of participants in all service territories 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. There are opportunities for additional program promotion directly to customers and to provide more promotional literature to trade allies; and

- **Recommendation:** ComEd, Nicor Gas, North Shore Gas, and Peoples Gas should work with trade allies to develop promotional literature that can be used by trade allies to promote the program to their customers, both at the time of purchase and before. Additional literature, especially that which contains information about equipment payback, will help trade allies to explain the benefits of higher efficiency measures to their customers.

Finding: Trade allies play an important role in both program promotion and in providing application assistance to their customers. If trade allies are to remain one of the primary methods of program promotion, then it is important to maintain their support and participation. This is especially true in North Shore Gas and Peoples Gas territory.

- **Recommendation**: Given the important role that the trade allies play, Navigant suggests that the utilities create an additional incentive or recognition for the trade allies who participate in the

program. This will help the program retain participating trade allies and will additionally help to increase "good will" toward the utilities and their programs.

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	Ex post 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 ex post 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 ex post 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	Ex post net
3	Net Savings	Research Findings net savings	Research	Research findings gross savings times NTGR	Ex post net
4	Net Savings	Evaluation Net Savings	Non-Deemed	Evaluation-Adjusted gross savings times NTGR	Ex post 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[6].

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)**

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

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 (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 ex post 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 Process Results

Participant Process Results

Please see Nicor Gas report and Peoples Gas and North Shore Gas report for detailed program process results.

Trade Ally Detailed Results

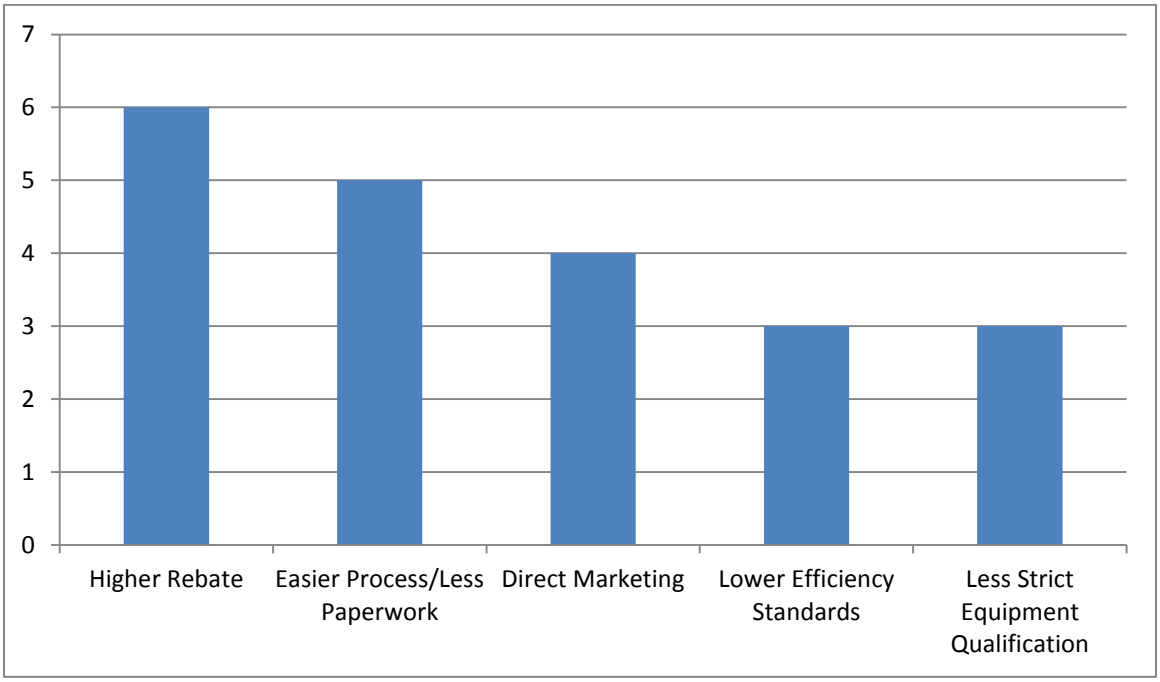
Please see the Nicor Gas Home Energy Efficiency Program GPY1 Evaluation Report and North Shore Gas and Peoples Gas Residential Prescriptive Rebate Program GPY1 Evaluation Report for additional trade ally survey process results. The following trade ally survey results pertain specifically to the CSR program and air conditioning unit replacements.

The HEER and RPR program trade allies were asked if they were aware of the Complete System Replacement component of the programs. A large majority of the respondents (91%) were aware of the component, and over half of the trade allies had (69%) participated in the CSR program. Of those who participated in the Complete System Replacement component of the program, all sold both heating and cooling equipment.

The Trade Allies were asked if the Complete System Replacement component of the program had any effect on the ability to market and sell energy efficient measures to customers. Over half (52%) the respondents said the component did have an effect. Of the mentioned effects, many respondents said it encouraged customers to replace both the heating and cooling systems at the same time due to the larger rebate. Respondents also said the rebates encouraged people to spend more on the higher efficiency systems.

When asked if they had any suggestions for improving the Complete System Replacement component of the program, many respondents suggested higher rebates. Some respondents mentioned the amount of paperwork made the rebate process longer and that it was difficult to obtain an AHRI number. Other suggestions included lowering the SEER rating and direct marketing to customers with their gas bill.

Figure 5-1. Trade Ally Recommendations for Improvements



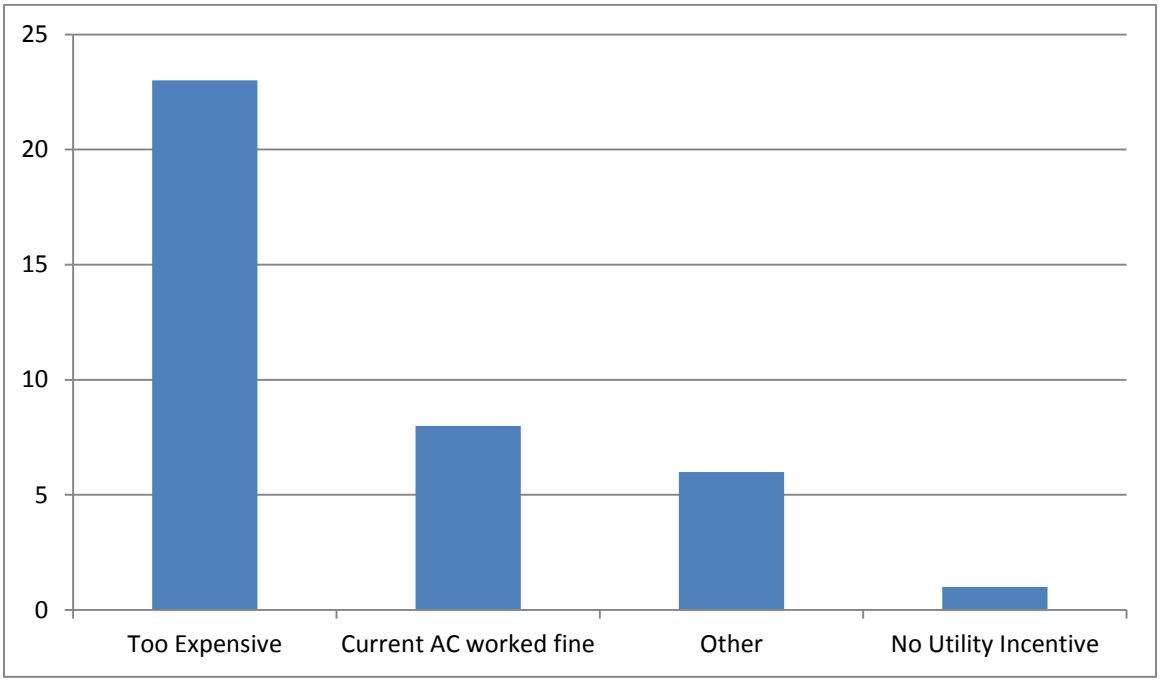
Source: Trade ally survey

Of the Trade Allies who were not aware of the Complete System Replacement component, all but one said customers replacing their furnace had also inquired about replacing their air conditioning system. The Trade Allies were asked if they suggested to customers replacing their furnace to also replace their air conditioning system. The vast majority (97%) of respondents said they did suggest it.

Of those trade allies, most (85%) reported that some of their customers did opt to replace their air conditioning units. Two of the respondents said all of their customers replaced their air conditioning systems and two respondents said none of them did.

When asked why they thought that their customers chose not to replace their air conditioning system and furnace at the same time, most trade allies (77%) said it was too expensive followed by their customers thinking that their current air conditioning system worked fine.

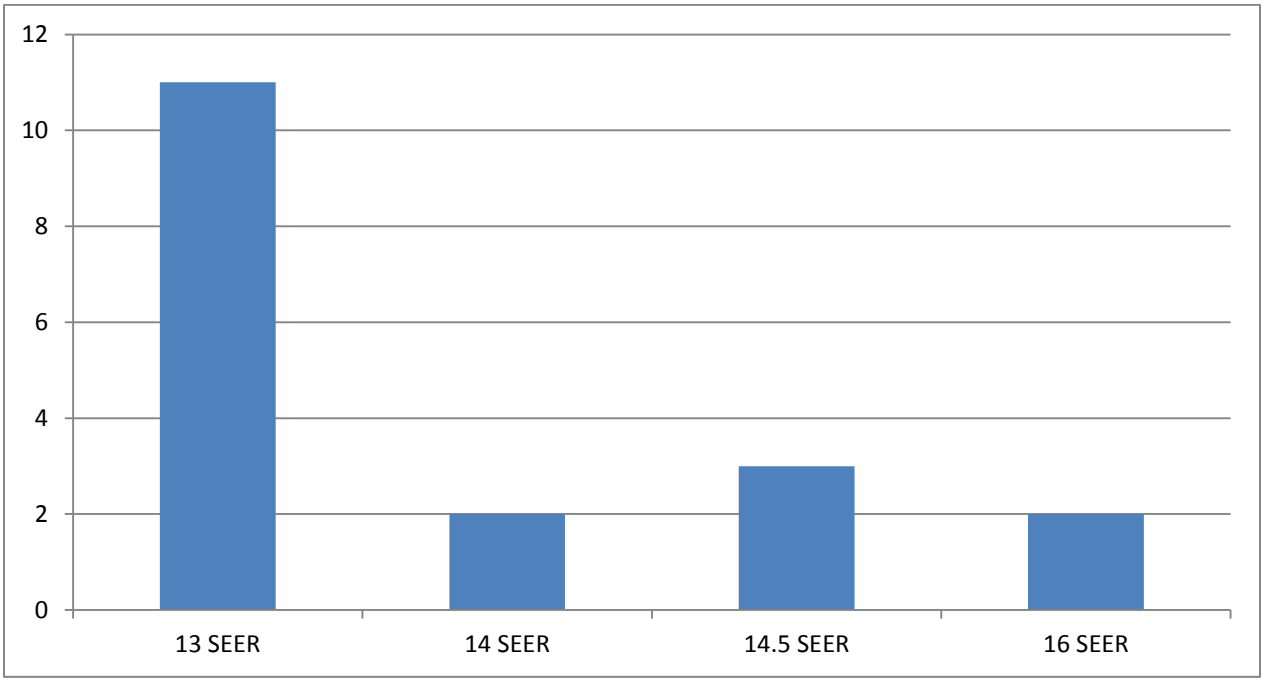
Figure 5-2. Reasons for Not Replacing Air Conditioning Units



Source: Trade ally survey

The Trade Allies who said their customers did replace their air conditioning systems were asked if those customers replaced their systems with an air conditioning unit with a SEER of 14.5 or greater. Over half of respondents (57%) said some of their customers replaced their systems with units with a 14.5 SEER or greater, thirty percent said all of their customers did, and a few respondents said none of their customers did. When the Trade Allies were asked what the typical SEER of the replacement units was that their customers installed, most said that is was a 13 SEER. A little over a third mentioned a SEER between 14.5 and 16.

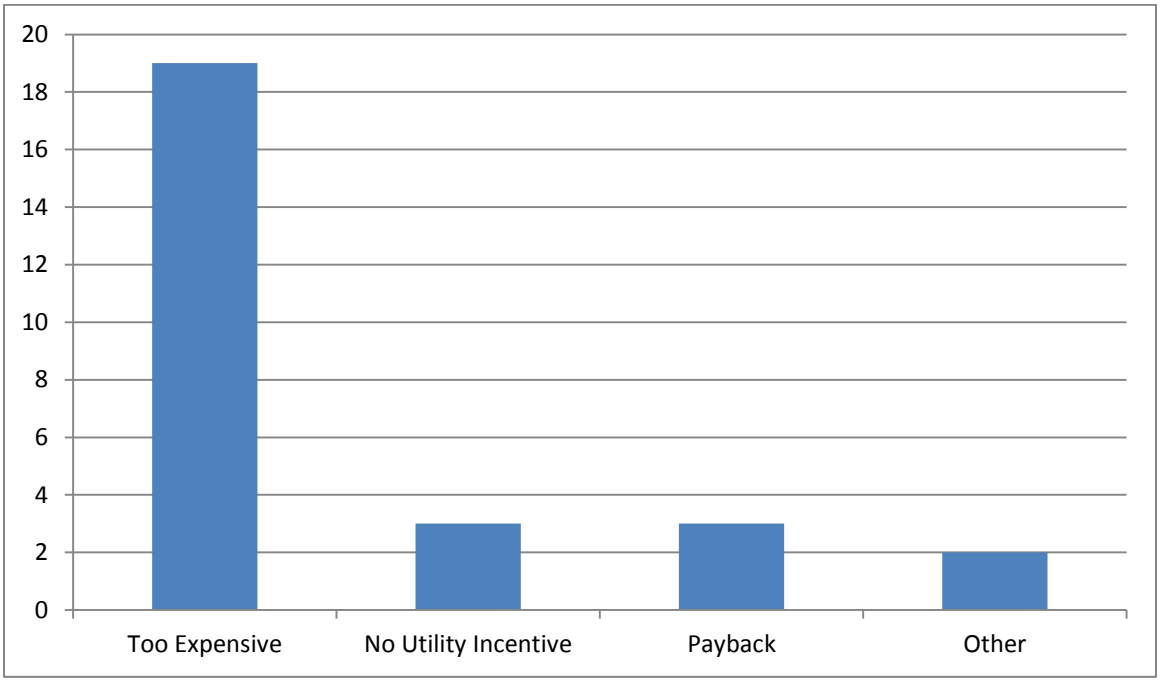
Figure 5-3. SEER of Non-CSR Air Conditioning Units



Source: Trade ally survey

When asked why their customers did not choose an air conditioning system with a SEER of 14.5 or greater the majority of trade allies (70%) said those air conditioning systems were too expensive. Only three respondents said there was no utility incentive for air conditioning at the time of purchase. Other reasons included low payback and low use of air conditioning due to cooler weather.

Figure 5-4. Reasons for Not Choosing an Efficiency Air Conditioning Unit



Source: Trade ally survey

5.3 *Detailed NTG Calculations*

Participant Free Ridership

To calculate free ridership, participants were asked a series of questions about their decision process as part of the participant survey. They 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,

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

5.4 *Data Collection Instruments*

5.4.1 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 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]

5. Less than 10 years old (installed 2001 or later)
6. 11 to 20 years old (installed 1991-2000)
7. 21-30 years old (installed 1981-1990)
8. 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]

5.4.2 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)
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
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.