



**Energy Efficiency / Demand Response
ComEd Plan Year 4
Nicor Plan Year 1
(6/1/2011-5/31/2012)**

**Evaluation Report:
Residential New Construction
Program**

FINAL

**Presented to
Nicor Gas
Commonwealth Edison Company**

January 10, 2013

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E. Executive Summary

This document presents the findings of the evaluation of the joint Residential New Construction program offered by Nicor Gas and ComEd. This evaluation covers Nicor Gas Plan Year 1 (GPY1) and ComEd Plan Year 4 (EPY4) and focuses on program processes. The program launched in early 2012 and did not claim any savings in this plan year. For this reason, Navigant did not conduct a full impact evaluation.

E.1 Evaluation Objectives

The objectives of the GPY1/EPY4 Residential New Construction Program evaluation were to (1) identify ways in which the program can be improved and (2) determine process-related program strengths and weaknesses. The program launched in 2012 and no homes were completed in GPY1/EPY4. This eliminated the need for a full impact evaluation.

E.2 Evaluation Methods

Navigant primarily used in-depth interviews and follow-up conversations with program staff to gain an understanding of the program as developed in GPY1 and EPY4. In addition to these interviews, Navigant also reviewed program manuals and other documentation. Navigant used these sources to create a logic model for the program, describe program theory and conduct a preliminary review of planned verification and due diligence procedures. We also reviewed the data fields included in the program tracking system and the proposed approach for calculating savings.

E.3 Key Impact Findings and Recommendations

This year's impact evaluation was limited to the verification, due diligence and tracking system review (presented in the appendix) and a preliminary review of the program's approach to calculating savings. Navigant's key findings and recommendations from these tasks are presented here:

- **Finding.** The program's planned verification and due diligence practices will meet most aspects of national best practices if implemented as documented.
Recommendation. Navigant recommends formalizing protocols for "problem" builders and raters in addition to following the excellent procedures already documented.
- **Finding.** The program's tracking system, RSR's proprietary HouseRater system, also meets or exceeds most national best practices.
Recommendation. Navigant recommends improving the documentation for this system, which will track extensive data at the home level, as well as linking it to the utility customer information systems.

E.4 Key Process Findings and Recommendations

Navigant's key process findings and recommendations are presented here:

- **Finding.** Navigant's review showed that the program has begun to successfully recruit builders and raters to the program using a variety of outreach activities. It is clear that this outreach and the development of training materials are in line with program theory.
- **Finding.** The fact that the program has been designed to operate with IECC 2012 as the baseline energy code shows that program staff is well aware of the challenges that the adoption of this code in Illinois will present.
- **Finding.** The program currently does not have any "branding" for program homes beyond their program qualification.
Recommendation. Navigant recommends developing program branding as soon as possible to raise program awareness among homeowners. This branding may align with existing Nicor Gas and ComEd branding.
- **Finding.** The initial program documentation does not have any formal market transformation goals; although interviews with program staff showed that market transformation is an "unwritten" goal. For example, Nicor Gas is working with the State of Illinois and the other Illinois utilities to develop building code compliance and advocacy programs for the next energy efficiency plan cycle.
Recommendation. Navigant recommends establishing formal market transformation goals as soon as possible. The program should also track key performance indicators related to market transformation, namely market share and program homes' time to purchase.

1. Introduction to the Program

This section provides a description of the program as well as key questions addressed by the evaluation.

1.1 Program Description

The Residential New Construction Program is jointly offered by Nicor Gas and ComEd. Nicor Gas is the lead utility as the majority of the avoided costs will be from natural gas. Residential Science Resources (RSR) implements the program for both utilities and WECC administers the program for Nicor Gas. The program launched in early 2012 and did not claim any savings in the first plan year. RSR uses completed REM/Rate files for each home to calculate whole-house savings. In addition, ComEd incentivizes several ENERGY STAR electric appliances and claims savings from these installations.

The program will rely on networks of builders and HERS raters to garner participation and has already attracted several raters and builders to the program. The current program structure relies heavily on raters to recruit builders to the program, and the current incentives are as such weighted towards raters. The Residential New Construction Program pays incentives of \$500 per home to raters and \$300 per home to builders; builders receive additional incentives from ComEd for installing program-qualified ENERGY STAR electric appliances. To qualify for the program, homes must achieve savings of at least 10% over an equivalent code-compliant new home. The current residential energy code in Illinois is IECC 2009, though it is expected to change to IECC 2012 within the next year.

1.2 Evaluation Questions

The evaluation sought to answer the key researchable questions listed in this section.

1.2.1 Impact Questions

1. Is the program's planned approach to calculating savings reasonable?
2. Are the necessary data input fields set up to track future savings?

1.2.2 Process Questions

1. How successful has builder outreach been? Has the program begun to build a strong network of participating builders?
2. How successful has rater recruitment been? Are builders able to easily find raters to work with?
3. Where are the opportunities for program improvement?
4. How is the program preparing for the adoption of IECC 2012 as the new residential energy code in Illinois?
5. Are the KPIs tracked appropriately?

2. Evaluation Methods

2.1 Primary Data Collection

The evaluation relied heavily on interviews with the Nicor Gas and ComEd program administrators and key RSR staff. Table 2- shows all of the data sources used for this evaluation. Since there was no impact evaluation this year, the process evaluation was the primary focus of the data collection.

Table 2-. Primary Data Collection Summary

| Collection Method | Subject Data | Quantity | Gross Impact | Net Impact | Process |
|---------------------------|--|----------|--------------|------------|---------|
| In-Depth Interviews | Program administrators and implementation contractor staff | 3 | | | X |
| Tracking System Review | List of data fields tracked in HouseRater | All | X | | X |
| Program Literature Review | Program manuals | All | | | X |

2.2 Impact Evaluation Methods

Navigant did not conduct a full impact evaluation for this program year because the program did not claim any savings. To answer the two impact questions stated in Section 1.2.1, Navigant conducted reviews of the program verification and due diligence procedures, planned savings calculation approaches, and tracking system.

These assessments relied on in-depth interviews with program and implementation staff and descriptions of program processes, such as those documented in the RSR Program manual. RSR also provided a list of data fields tracked by their proprietary system, HouseRater, a user guide to HouseRater, and documentation of RSR’s internal quality assurance procedures. To conduct the best practices benchmarking assessment, we consulted the Best Practices Self-Benchmarking Tool from the National Energy Efficiency Best Practices Study.¹

¹ “BP Self Benchmarking Tool_Final 110707_with Scoring Sheets.xls” from the National Energy Efficiency Best Practices Study. Pacific Gas and Electric Company, 2007.

3. Evaluation Results

3.1 Impact Evaluation Results

This section presents the impact evaluation results for the joint Residential New Construction Program. Since the program did not claim any gas or electric savings in this program year, Navigant limited the impact evaluation to a preliminary review of the program’s planned verification and due diligence procedures and tracking system. The following sections present key findings from this review; full results may be found in the appendix.

3.1.1 Verification and Due Diligence Procedure Review

Navigant reviewed RSR’s work towards establishing comprehensive procedures for verification and due diligence. If implemented as planned, these procedures will meet most aspects of national best practices. HERS providers will be required to conduct a file review for at least 10% of each rater’s homes as well as field verification of at least 1% of each rater’s homes. In addition, RSR will conduct independent quality assurance field inspections on a sample of program homes such that each rater will be inspected at least once up to 2% of their homes and a total of 20 program homes annually. The completion of these audits will be tracked as a key performance indicator (KPI) of RSR’s performance. The exact procedure for this process has not been finalized. RSR also adheres to a quality assurance manual internally for reviewing data entered into the tracking system, HouseRater, and utilizes data validation through an internal audit process for key data fields to aid manual quality control practices.

Navigant offers the following observations regarding RSR’s quality assurance and verification procedures for the Nicor Gas and ComEd joint Residential New Construction Program:

- RSR’s planned quality assurance and verification procedures meet most aspects of national best practices by utilizing RESNET-approved verification procedures and developing a sophisticated data tracking system. Navigant suggests formalizing procedures for corrective action when the Program encounters “problem” raters or builders. We will update this review once the Program has begun claiming savings and these procedures have been put into practice.
- The comprehensive HouseRater tracking system eliminates many potential areas of error, such as manual or duplicative data entry. This will benefit the Program and allow dedication of resources to ensuring that raters enter quality data, providing consistency and accuracy and avoiding a “garbage in, garbage out” scenario.
- Navigant did not rate the program on some best practice areas (listed below) due to the lack of program activity this year. We will provide feedback on the following areas in the Nicor Gas PY2 and ComEd PY5 evaluation cycles:
 - Timeliness of feedback to raters and builders
 - Recognition of different inspection needs of builders with varying levels of program experience (to date all builders are new to the program)

Navigant offers the following recommendations in relation to the quality assurance and verification procedures for the joint Residential New Construction Program:

- Navigant recommends continuing to follow well-defined quality assurance and verification procedures including the following:
 - Random sampling for field and paper inspections by both the HERS Providers and RSR staff
 - Review of data submitted to HouseRater
 - Formalizing protocols for “problem” raters or builders

3.1.2 Tracking System Review

Navigant reviewed RSR’s proprietary HouseRater software, which the program uses to collect and track extensive data on Program homes. The software requires builders and raters to upload REM/Rate files for each submitted home and pulls all data points from the file into the tracking system. The level of detail captured by this tracking system exceeds national best practices. This will be a significant asset to the program. RSR is working with both Nicor Gas and ComEd to establish a system for transferring selected data from HouseRater to the utilities’ program tracking databases. RSR has established which data will be transferred, but the method of transfer is being established and is not yet final.

Navigant offers the following observations regarding RSR’s HouseRater data tracking system for the Nicor Gas and ComEd joint Residential New Construction Program:

- RSR’s HouseRater system tracks extensive data, but this data is not yet linked to utility customer databases. Navigant recommends linking these databases to ease the identification of customers living in program homes. This will be very useful for future evaluations when Navigant will conduct homebuyer surveys and billing analyses.
- While RSR tracks many data points for each home, the system does not explicitly track any market transformation indicators. Fields such as “effective_sale_dt” and “date_purchased” could be combined with data on home completion to track time to purchase, an indicator of demand for efficient homes. Gathering data on home price and program home market saturation would also be useful. Tracking these indicators over the course of the program will be critical for estimating long-term market transformation effects of the program.
- RSR has developed a detailed user manual for builders and raters utilizing the HouseRater system. However, RSR could not provide a detailed data dictionary defining fields and data validation. More extensive documentation of the system will be necessary for future evaluations and will also reduce the learning curve for internal staff training to work with the system as the program grows.
- Although HouseRater does track some cost data for other utility programs that RSR implements, the Nicor Gas and ComEd Program does not currently track measure cost data. Navigant recommends that the program start to collect and track incremental measure cost data where possible. This can be done in a number of ways, including – as a starting point – tying secondary data on measure-level costs to measure-level tracking data. These estimates can then be refined through future evaluation builder surveys.

- Navigant did not rate the program on all best practice areas due to the lack of program activity this year. We will provide feedback on the following area in the Nicor Gas PY2 and ComEd PY5 evaluation cycles:
 - Automation of routine reporting (reporting mechanisms not yet finalized)

Navigant offers the following recommendations in relation to the tracking system for the joint Residential New Construction Program:

- We recommend linking HouseRater to utility customer databases so that Nicor Gas and ComEd customers living in Program homes can be identified.
- Navigant recommends that the Program identify key market transformation metrics to track in HouseRater such as time to purchase and market saturation (percentage of new construction homes in service territory participating in program).
- Navigant recommends developing a detailed data dictionary with the following information:
 - For each table:
 - Summary of fields included
 - Purpose of table
 - For each field:
 - Definition of field
 - Field type, e.g. string, integer, number
 - Data validation rules, e.g. range restrictions
 - Method of entry, e.g. entered by builder/rater or pulled from REM/Rate file
- Navigant recommends that the Program start to collect and track home cost and price data.

3.1.3 Review of Savings Calculation Approach

In addition to the reviews above, Navigant also reviewed and discussed with program staff the planned approach to calculating program savings. RSR will use HouseRater to extract input and savings data from completed REM/Rate files. This is an appropriate approach for program implementation. Navigant does plan to evaluate the program using a more accurate hourly simulation software, but given the widespread use of REM/Rate in the rating community this would not be a practical change for the implementation team to make.

3.2 Process Evaluation Results

This section presents the results of the process evaluation as defined by the research questions in Section 1.2.2.

3.2.1 Builder and Rater Outreach and Recruitment

RSR has been putting effort into recruiting raters and builders to the program through several channels.

To recruit raters, the program has used the following outreach activities:

- Reaching out to and meeting one-on-one with individual raters and rating companies in service territory
- Presenting at Illinois Better Buildings conferences

- Working with Residential Energy Services Network (RESNET) to reach raters

In addition to training raters to recruit builders from their own networks, the program has used the following builder outreach activities:

- Hosting training seminars to engage and educate builders
- Leveraging national and local homebuilders' associations (HBAs) to reach builders
- Inviting builders to meet one-on-one to learn about the program

At the time of Navigant's interviews with program staff, RSR had recruited ten rating companies and six builders to the program. This progress shows that activities to date have been successful.

3.2.2 Preparation for Code Change to IECC 2012

Program staff is very aware of the challenges presented by the upcoming code change to IECC 2012. Staff cited the fact that many builders already struggle with IECC 2009. With this in mind, RSR is working to limit program design changes as much as possible to avoid disrupting participation. To this end, RSR designed the program in anticipation of the IECC 2012 code requirements. The program will market to builders by promoting its ability to help them build to or exceed code.

3.2.3 Tracking of Key Performance Indicators

The program theory and logic model review compiled several key performance indicators (KPIs) that will help gauge program success over upcoming years. Among the KPIs that Navigant identified, several will be measured through evaluation activities, namely builder, rater and homeowner surveys. However, Navigant will also rely on program tracking data and staff knowledge for the following KPIs:

- Number of raters contracting with program and active in the program
- Number of participating builders
- Number of training sessions held for raters and builders
- Amount of marketing material developed and distributed
- Number of homes rebated by the program
- Total rebates awarded by the program
- Purchase rate or days on market for program homes
- Therms, kWh, and kW saved by program homes

The majority of these KPIs are outlined in RSR's statement of work contract with the utilities. The HouseRater system will track home data as well as number of builders and raters active in the program. RSR also tracks program events such as training sessions through another table within HouseRater. The program should ensure that records are also kept of all marketing materials and their distribution.

The only indicator that the program does not have an existing function to track is the purchase rate or days on market for program homes. This data could be used in comparison to overall market data to gauge consumer interest in program homes.

3.2.4 Opportunities for Program Improvement

Overall, RSR has designed a well-planned program that will meet many national best practices. During the course of the logic model and program theory development, Navigant observed only two areas where program processes should be improved: lack of program branding and lack of formal market transformation goals.

3.2.4.1 Program Branding

The Nicor Gas and ComEd program is not working with ENERGY STAR or using another industry standard such as HERS ratings to qualify program homes. While this allows the program flexibility and transparency in accepting high efficiency homes, it will make it more difficult for builders to market program homes to customers as there will be little to no market recognition of the advantages of program homes. RSR confirmed that program branding will be developed once the program gets up and running and Navigant strongly recommends establishing a program brand as soon as possible to build awareness in homeowners.

3.2.4.2 Market Transformation

Residential new construction programs can be drivers of market transformation. Although all program staff noted that an “unofficial” goal of the Nicor Gas and ComEd program is transformation of the new construction market in the region, this is not formally stated in any program documentation. This program has the opportunity to track key indicators of market transformation from the beginning, which will be crucial in determining market effects savings in the future. Navigant recommends establishing formal market transformation goals and procedures to track metrics such as program market share and time to purchase for program homes as soon as possible.

4. Findings and Recommendations

4.1 Key Impact Findings and Recommendations

This year's impact evaluation was limited to the verification, due diligence and tracking system review (presented in the appendix) and a preliminary review of the program's approach to calculating savings. Navigant's key impact findings and recommendations from these tasks are presented here:

- **Finding.** The program's planned verification and due diligence practices will meet most aspects of national best practices if implemented as documented. However, the program does not currently have established protocols to deal with "problem" raters and builders.
Recommendation. The program should formalize protocols for "problem" builders and raters. Clearly outlining consequences for "problem" raters and builders will ensure that the negative effects of these participants can be mitigated efficiently. This process should also incorporate an educational aspect to maintain good relations with as many raters and builders as possible.
- **Finding.** The program's tracking system, RSR's proprietary HouseRater system, also meets or exceeds most national best practices. While the database tracks extensive data, RSR does not have any documentation to identify the fields and database structure, and the database is not linked to utility customer information systems.
Recommendation. RSR should improve the documentation for the HouseRater tracking system. RSR should also work with Nicor and ComEd to link HouseRater to utility customer information systems. Improved documentation will help new users become familiar with the system much more quickly, and will also facilitate evaluation. Linking to the customer information systems will enable the program to identify homeowners who have purchased program homes. This group can provide valuable information on program awareness and how well builders, raters, and real estate professionals are marketing the program.

4.2 Key Process Findings and Recommendations

At this stage in the program's development, Navigant finds that program processes have been well planned and should lead to successful program implementation in upcoming years. Navigant's key process findings and recommendations are presented here:

- **Finding.** Navigant's review showed that the program has begun to successfully recruit builders and raters to the program using a variety of outreach activities. It is clear that this outreach and the development of training materials are in line with program theory.
- **Finding.** The fact that the program has been designed to operate with IECC 2012 as the baseline energy code shows that program staff is well aware of the challenges that the adoption of this code in Illinois will present.
- **Finding.** The program currently does not have any "branding" for program homes beyond their program qualification.
Recommendation. The program should develop a program "brand" as soon as possible to raise awareness among homeowners. This will help raise awareness among homeowners and the real

estate community, which in turn can create demand for program homes as well as increase the market value of the homes.

- **Finding.** The initial program documentation does not have any formal market transformation goals; although interviews with program staff showed that market transformation is an “unwritten” goal.

Recommendation. We recommend establishing formal market transformation goals as soon as possible. Identifying program market transformation goals will help the program formalize processes to track the key market transformation metrics identified in the program theory memorandum (Appendix 5.3). These metrics will be very valuable to the program once it has matured and seeks to quantify market effects. Starting to track these metrics early will enable the program to establish a solid baseline estimate that can be compared to future program years.

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, Retrocommissioning), 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, Retrocommissioning), 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, Nicor Gas 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, Nicor Gas 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, 2012².

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

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

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

² IL-TRM_Policy_Document_10-31-12_Final.docx

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

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

Savings Verification: An evaluation process that independently verifies program savings achieved through prescriptive measures. This process verifies that the TRM was applied correctly and consistently by the program being investigated, that the measure level inputs to the algorithm were correct, and that the quantity of measures claimed through the program are correct and in place and operating. The results of savings verification may be expressed as a program savings realization rate (verified 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 *Final Verification, Due Diligence and Tracking System Review*

To: Andy Kuc, WECC; Luke Bockewitz, ComEd; Scott Dimetrosky, Nicor Gas;
From: Laura Tabor, Julianne Meurice, Jeff Erickson, Randy Gunn; Navigant
Copy: Jim Jerozal, Nicor Gas, David Nichols, ComEd; Jennifer Hinman, David Brightwell, ICC
Date: September 14, 2012
Re: Verification, Due Diligence and Tracking System Review of Nicor Gas and ComEd’s Joint Residential New Construction Program (the “Program”)

This document provides the results from our due diligence review of the quality assurance, Program tracking, and savings verification procedures of the Nicor Gas and ComEd joint Residential New Construction Program. This Program recently completed Program Year 1 (GPY1) for Nicor Gas and Program Year 4 (EPY4) for ComEd. The Verification and Due Diligence recommendations are based on findings from the in-depth interviews with the Program staff and the implementation team (Residential Science Resources (RSR)), as well as review of Program manuals and available information on the data tracking system. The Program did not claim any savings in its initial year and thus we were not able to review any participant-level data. The primary areas of inquiry were to determine:

- Whether appropriate eligibility criteria will be properly adhered to and applications will be appropriately completed and backed with supporting documentation
- Whether the planned QA/QC activities are adequate and unbiased (e.g., are samples statistical, is there incorrect sampling that may skew results, etc.)
- Whether all required project information will be entered in an accurate and timely manner in the tracking system and savings will be calculated correctly.

This memo is based on information disclosed by RSR to Navigant that is confidential and only to be distributed to those working on the Program or those within Nicor Gas, ComEd, Navigant or other related parties (e.g., ICC) that have a need to know this memo’s contents.

Overview of Findings

This section presents the observations and recommendations Navigant reached after completing the review.

Verification and Due Diligence

RSR is working to establish comprehensive procedures for verification and due diligence. If implemented as planned, these procedures will meet most aspects of national best practices. HERS providers will be required to conduct a file review for at least 10% of each rater’s homes as well as field verification of at least 1% of each rater’s homes. In addition, RSR will conduct independent quality assurance field inspections on a sample of Program homes such that each rater will be inspected at least once up to 2% of their homes and a total of 20 Program homes annually. The

completion of these audits will be tracked as a key performance indicator (KPI) of RSR's performance. The exact procedure for this process has not been finalized. RSR also adheres to a quality assurance manual internally for reviewing data entered into the tracking system, HouseRater, and utilizes data validation through an internal audit process for key data fields to aid manual quality control practices.

Navigant offers the following observations regarding RSR's quality assurance and verification procedures for the Nicor Gas and ComEd joint Residential New Construction Program:

- RSR's planned quality assurance and verification procedures meet most aspects of national best practices by utilizing RESNET-approved verification procedures and developing a sophisticated data tracking system. Navigant suggests formalizing procedures for corrective action when the Program encounters "problem" raters or builders. We will update this review once the Program has begun claiming savings and these procedures have been put into practice.
- The comprehensive HouseRater tracking system eliminates many potential areas of error, such as manual or duplicative data entry. This will benefit the Program and allow dedication of resources to ensuring that raters enter quality data, providing consistency and accuracy and avoiding a "garbage in, garbage out" scenario.
- Navigant did not rate the Program on some best practice areas (listed below) due to the lack of Program activity this year. We will provide feedback on the following areas in the GPY2/EPY5 evaluation cycles:
 - Timeliness of feedback to raters and builders
 - Recognition of different inspection needs of builders with varying levels of Program experience (to date all builders are new to the Program)

Reporting and Tracking

RSR uses proprietary software called HouseRater to collect and track extensive data on Program homes. The software requires builders and raters to upload REM/Rate files for each submitted home and pulls all data points from the file into the tracking system. The level of detail captured by this tracking system exceeds national best practices. This will be a great asset to the Program. RSR is working with both Nicor Gas and ComEd to establish a system for transferring selected data from HouseRater to the utilities' Program tracking databases. RSR has established which data will be transferred, but the method of transfer is being established and is not yet final.

Navigant offers the following observations regarding RSR's HouseRater data tracking system for the Nicor Gas and ComEd joint Residential New Construction Program:

- RSR's HouseRater system tracks extensive data, but this data is not yet linked to utility customer databases. Navigant recommends linking these databases to ease the identification of customers living in Program homes. This will be very useful for future evaluations when Navigant will conduct homebuyer surveys.
- While RSR tracks many data points for each home, the system does not explicitly track any market transformation indicators. Fields such as "effective_sale_dt" and "date_purchased" could be combined with data on home completion to track time to purchase, an indicator of

- demand for efficient homes.³ Gathering data on home price would also be useful. Tracking these indicators over the course of the Program will be critical for estimating long-term market transformation effects of the Program.
- RSR has developed a detailed user manual for builders and raters utilizing the HouseRater system. However, RSR could not provide a detailed data dictionary defining fields and data validation. More extensive documentation of the system will be necessary for future evaluations and will also reduce the learning curve for internal staff training to work with the system as the Program grows.
 - Although HouseRater does track some cost data for other utility programs that RSR implements, the Nicor Gas and ComEd Program does not currently track cost data. Navigant recommends that the Program start to collect and track incremental cost data where possible.
 - Navigant did not rate the Program on all best practice areas due to the lack of Program activity this year. We will provide feedback on the following area in the Nicor Gas PY2 and ComEd PY5 evaluation cycles:
 - Automation of routine reporting: reporting mechanisms not yet finalized

Summary of Recommendations

Navigant offers the following recommendations in relation to the quality assurance and verification procedures as well as the tracking system for the joint Residential New Construction Program:

- Navigant recommends continuing to follow well-defined quality assurance and verification procedures including the following:
 - Random sampling for field and paper inspections by both the HERS Providers and RSR staff
 - Review of data submitted to HouseRater
 - Formalizing protocols for “problem” raters or builders
- We recommend linking HouseRater to utility customer databases so that Nicor Gas and ComEd customers living in Program homes can be identified
- Navigant recommends that the Program identify key market transformation metrics to track in HouseRater such as time to purchase and market saturation (percentage of new construction homes in service territory participating in program).
- Navigant recommends developing a detailed data dictionary with the following information:
 - For each table:
 - Summary of fields included
 - Purpose of table
 - For each field:
 - Definition of field
 - Field type, e.g. string, integer, number
 - Data validation rules, e.g. range restrictions
 - Method of entry, e.g. entered by builder/rater or pulled from REM/Rate file
- Navigant recommends that the Program start to collect and track home cost and price data

³ Note that time to purchase may need to be estimated via extrapolation from other data sources, including account transfer dates.

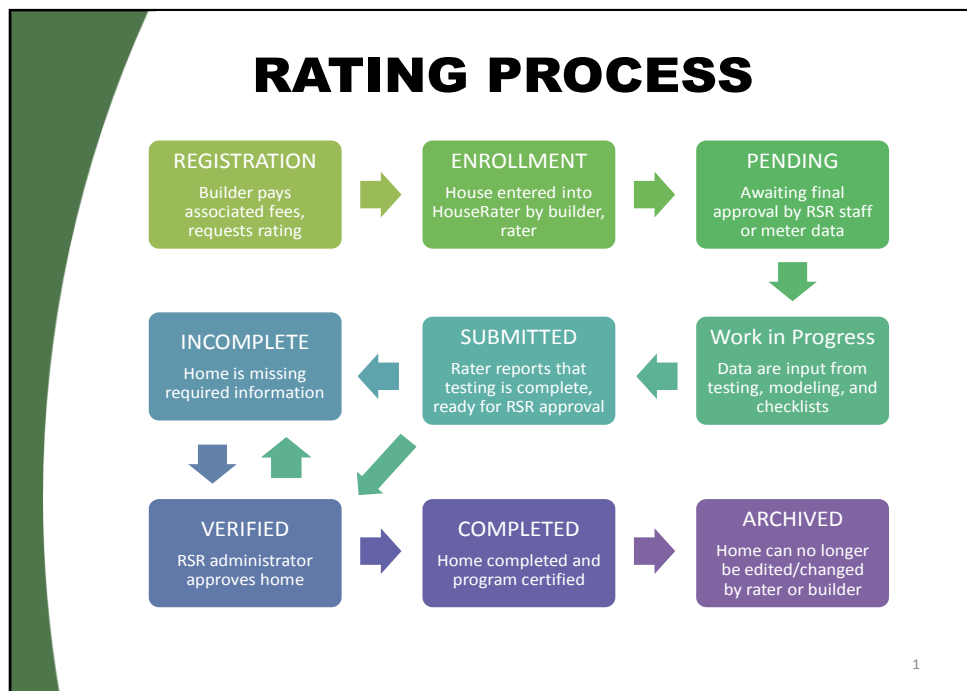
Data Collection

This assessment relied on in-depth interviews with Program and implementation staff and descriptions of Program processes, such as those documented in the RSR Program manual. RSR also provided a list of data fields tracked by HouseRater, a user guide to HouseRater, and documentation of RSR’s internal quality assurance procedures. To conduct the best practices benchmarking assessment, we consulted the Best Practices Self-Benchmarking Tool from the National Energy Efficiency Best Practices Study.⁴

The results of these tasks are presented below. This is followed by the results of the benchmarking assessment.

Review of Program Operating Procedures and Tracking System

Figure 5-. Major steps in home rating process



We examined the operating procedures and tracking system used by RSR to process applications for the joint Residential New Construction Program. The Program operating plan provides a flow diagram of the following steps that are to be followed in the home rating process⁵:

Before the home is enrolled, the builder and rater work together to ensure that the home will qualify. The rater will provide feedback on design documents and also conduct inspections throughout the construction phase. Especially in the early stages of the program, RSR will encourage builders to

⁴ “BP Self Benchmarking Tool_Final 110707_with Scoring Sheets.xls” from the National Energy Efficiency Best Practices Study. Pacific Gas and Electric Company, 2007.

⁵ Source: “Residential New Construction Program Operating Plan 2012 working document.doc”, provided by WECC April 2012.

work with a HERS rater during the design stages so that the rater can offer suggestions for improved efficiency. The home will not be submitted until the rater's final inspection results have been uploaded to HouseRater in the form of the final REM/Rate file.

Below is our assessment of the registration, enrollment, submittal, review process, and data tracking system.

Registration

All builders must register with the Program and attend an introductory training session. Builders must be licensed and bonded and are encouraged to register as ENERGY STAR partners. HERS raters must be Residential Energy Services Network (RESNET) authorized and use energy modeling software approved by RESNET.⁶ HERS raters also need to be in good standing with their HERS Provider in order to join the Program network. Raters sign a contract with RSR to participate in the Program.

The registration procedures and requirements, along with the associated training sessions, assure that qualified raters will be working for the Program and providing builders with sufficient assistance.

Up-front builder training provides participants with the knowledge base necessary to understand Program requirements.

Enrollment

Builders or raters use the HouseRater software to enroll a home. Each home is assigned a unique identifier when entered into the tracking system. Data entered for enrollment includes the following⁷:

- Builder Name
- Home Address
- Date enrolled
- Rating company name

After enrollment, RSR will review home data to ensure that the home is within the Nicor and ComEd service territories to verify that it qualifies for the Program.

The enrollment step allows the Program to track each home from the early stages of participation through completion, and gives RSR the opportunity to verify important qualification information early on.

⁶ Nicor/ComEd Residential New Construction Program SOW. "Nicor ComEd RNCP SOW Rev1 Final AK.doc", provided by WECC July 2012.

⁷Ibid.

Submittal

Once the rater has completed all required inspections and finalized a REM/Rate file for the home, he or she will submit the final home data for RSR's review. Once this step is complete, all REM/Rate data from the home is housed in the tracking system and available for RSR's review. HouseRater will not permit submittal until all required reports, photographs, and data have been uploaded.

HouseRater's ability to force complete data entry will limit incomplete home submittals and will save time in the subsequent review process.

Verification and Certification

After submittal, RSR reviews the data uploaded for the home using internal quality assurance procedures. An RSR administrator will review the photographs, reports, and data to ensure that all materials have been properly uploaded and correspond to the correct home. If RSR finds any missing material, the reviewer is required to request additional information from the rater. Once all necessary material is collected, RSR verifies home compliance or rejects the home. If RSR verifies compliance, the home becomes Program certified.

If a home is selected for QA inspection, the HERS Provider will review the home files or physically inspect the home in this period as well.

Administrative review of individual home files should provide sufficient review for home payments.

Archival

Once a home has been certified and paid, it is archived and the rater and builder cannot make further adjustments.

This process ensures that home data is preserved accurately and can be utilized effectively by evaluators as well as for Program planning purposes.

Tracking System

As described in the sections above, HouseRater is an integral part of the participation process in addition to being the Program tracking system. This best practice system minimizes duplicative data entry and avoids associated data transfer errors. Navigant has not been able to review individual home data because no homes have been claimed to date. We will update this review in the Nicor Gas PY2 and ComEd PY5 evaluations with findings from a sample of home submittals.

HouseRater's ability to read REM/Rate files enables the Program to track home data at a very detailed level. This will be very useful for future evaluations provided data is accurate and can be provided to evaluators. RSR should be prepared to provide full home data to evaluators, beyond the level of detail provided to Nicor Gas and ComEd. Future evaluations will likely require at least read-only access to the system.

As discussed in previous sections, one aspect of the tracking system still in development is the process of transferring data to the two utility clients. Navigant recommends enabling direct data transfer to each utility's databases if possible. Additionally, the utility customer information systems should be linked to Program data to ensure that customers living in Program homes can be identified. This will be critical in future evaluations when homebuyer surveys are conducted.

To date the Nicor Gas and ComEd Program does not track any total or incremental cost data. HouseRater does have the capability to track cost data and collects some for other utility programs. It can be difficult to accurately track incremental costs for new construction. However, the Program has the advantage of working with builders closely to help them weigh the benefits and costs of building Program homes, and builders could be an excellent source of incremental cost estimates. One approach is to collect cost data on individual building components. Since HouseRater already tracks home components at a great level of detail, this could be done with few changes to the system. At minimum the program should track total home cost.

Because the Program has not yet defined its market transformation goals, HouseRater does not currently track any related data. We suggest tracking time to purchase and selling price at the home level. The Program should also monitor market data to track the market share of Program homes on a regular basis.

HouseRater captures extensive detail on program homes and will be a great resource for the program especially with the addition of cost and market transformation data tracking. Greater documentation of tracking data fields is needed.

Benchmarking

To conduct the best practices benchmarking assessments, we compared RSR’s practices with the Best Practices Self-Benchmarking Tool⁸ from the *National Energy Efficiency Best Practices Study* (numbered items in *italic font*). The benchmarking categories used were Quality Control and Verification and Reporting and Tracking.

Quality Control and Verification Benchmarking

Table 5- summarizes the scores as determined by the Self-Benchmarking Tool criteria in the “Quality Control and Verification” section. The bulleted list below provides additional descriptions of the chosen rating.

*See the Best Practices Self-Benchmarking Tool developed for the Energy Efficiency Best Practices Project: <http://www.eebestpractices.com/benchmarking.asp>.

Table 5-. Quality Control and Verification Benchmarking Scores

| ID | Best Practice | Score* |
|----|---|------------------------|
| 1 | Treat inspection visits as partnership-building & learning events rather than just regulatory enforcement activities. | Meets best practice. |
| 2 | Require builder or builder’s representative to be on-site during inspection. | Needs some improvement |
| 3 | Plan to rely on third-party inspectors for quality control over the long-term. | Meets best practice |
| 4 | Encourage home inspectors to organize their own professional organization. | Needs some improvement |
| 5 | Provide timely feedback to builders, home inspectors, and other parties. | Not rated |
| 6 | Ensure that inspectors have plenty of hands-on construction experience. | Needs some improvement |
| 7 | Establish a streamlined inspection scheduling process. | Meets best practice |
| 8 | Recognize the different inspection needs of experienced builders and builders who are new to the Program. | Not rated |
| 9 | Host pre-construction meetings with the builder, key subcontractors, and suppliers to review project specifications and Program requirements. | Meets best practices |

*Scores are based on the metric definitions contained in the tool.

1. *Treat inspection visits as partnership-building & learning events rather than just regulatory enforcement activities.*
 - *Meets best practice.* Program documentation encourages participating raters and builders to work together throughout construction and inspection process and relies on raters to help educate builders.
2. *Require builder or builder’s representative to be on-site during inspection.*
 - *Needs some improvement.* The Program does not require builders to be on-site during home inspections, but does encourage raters to provide useful feedback to builders based on inspection results. This is standard practice but could be improved.
3. *Plan to rely on third-party inspectors for quality control over the long-term.*
 - *Meets best practice.* RSR relies on HERS providers for one level of quality control, and also requires additional inspection by RSR representatives. Quality assurance designees must be independent and cannot have played any role in the design or rating of the homes that they review.

4. *Encourage home inspectors to organize their own professional organization.*
 - *Needs some improvement.* The Program aims to provide significant support to raters and play an indirect role in developing the rater community by increasing available business and opportunities for raters to advance their skills.
5. *Provide timely feedback to builders, home inspectors, and other parties.*
 - *Not rated.* The Program has not been active long enough to assess this point.
6. *Ensure that inspectors have plenty of hands-on construction experience.*
 - *Needs some improvement.* Raters must be certified HERS raters in good standing with their provider, but the Program does not specifically require extensive construction experience.
7. *Establish a streamlined inspection scheduling process.*
 - *Meets best practice.* This area is pending further review once homes have been completed within the Program. Builders and raters can communicate via HouseRater, which includes tools for scheduling inspections. HouseRater also provides forms for inspections, which can be filled out and submitted back into the system.
8. *Recognize the different inspection needs of experienced builders and builders who are new to the Program.*
 - *Not rated.* Program is new and all builders are new to the Program. No formal procedure in place to date.
9. *Host pre-construction meetings with the builder, key subcontractors, and suppliers to review project specifications and Program requirements.*
 - *Meets best practice.* Raters and builders are strongly encouraged to meet in the early stages of home design in order for builders to get maximum feedback and support from raters. The Program in turn ensures that raters have adequate experience and training to provide this support.

Reporting and Tracking Benchmarking

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

Table 5-. Reporting and Tracking Benchmarking Scores

| ID | Best Practice | Score* |
|----|--|--------------------------------------|
| 1 | Define and identify the key information needed to track and report early in the Program development process | <i>Meets best practice</i> |
| 2 | Minimize duplicative data entry; link databases to exchange information dynamically | <i>Meets best practice</i> |
| 3 | Track market transformation Program qualitative benefits and measures related to spillover effects, along with direct savings impacts. | <i>Needs significant improvement</i> |
| 4 | Develop accurate algorithms and assumptions on which to base estimates of savings. | <i>Needs some improvement</i> |
| 5 | Design databases to be scalable to accommodate changes in Program scope. | <i>Meets best practice</i> |
| 6 | Use the Internet to facilitate data entry and reporting. | <i>Meets best practice</i> |
| 7 | Automate routine functions such as monthly reports. | <i>Not rated</i> |
| 8 | Build in rigorous quality control screens for data entry. | <i>Meets best practice</i> |
| 9 | Document the tracking system carefully. | <i>Needs some improvement</i> |

*Scores are based on the metric definitions contained in the tool.

1. *Define and identify the key information needed to track and report early in the Program development process*
 - *Meets best practice.* HouseRater tracks extensive home data and the Program administrator has been proactive in seeking feedback from evaluators on potential for additional data needs. RSR is working with Nicor Gas and ComEd to determine which data will be transferred to the utilities for reporting purposes well ahead of the first home completions.
2. *Minimize duplicative data entry; link databases to exchange information dynamically*
 - *Meets best practice.* The digital storage provided by HouseRater facilitates easy data transfer. Furthermore, HouseRater’s ability to read data from REM/Rate files removes the need for manual data entry from REM/Rate into the tracking system.
3. *Track market transformation Program qualitative benefits and measures related to spillover effects, along with direct savings impacts.*
 - *Needs significant improvement.* This area is pending future Program development. Market transformation goals have not been formally identified to date and thus indirect and qualitative Program impacts are not currently tracked. However, it seems that HouseRater could be easily updated to begin tracking additional Program effects. Home-level data should include time to purchase and selling price, and if possible incremental cost. The Program should also monitor market data to track Program market share on a regular basis.
4. *Develop accurate algorithms and assumptions on which to base estimates of savings.*
 - *Meets Best Practice.* The Program uses REM/Rate to calculate savings for homes. REM/Rate is widely viewed as an acceptable savings estimation tool for program

implementation. However, Navigant will evaluate the program using an hourly simulation software as REM/Rate primarily a tool for generating HERS indexes and is not the most accurate software for generating energy savings estimates, especially electric-peak demand reductions.

5. *Design databases to be scalable to accommodate changes in Program scope.*
 - *Meets best practice.* RSR confirmed that adding fields to HouseRater would be straightforward. Additionally, the system is designed to accommodate a large volume of data easily.
6. *Use the Internet to facilitate data entry and reporting.*
 - *Meets best practice.* This area is pending final coordination of data transfer to utilities. HouseRater facilitates data entry as discussed above in (2). RSR will be able to extract data easily from the system to provide reports to Nicor Gas and ComEd, but the exact method of data transfer has not been determined.
7. *Automate routine functions such as monthly reports.*
 - *Not rated.* See (6), above.
8. *Build in rigorous quality control screens for data entry.*
 - *Meets best practice.* RSR utilizes data validation for some fields in HouseRater and uses manual review to screen additional data. Another example is that HouseRater will not allow homes to be submitted until all necessary data, reports, and photographs have been submitted. RSR also gives additional attention to homes claiming higher savings which is important for accuracy.
9. *Document the tracking system carefully.*
 - *Needs some improvement.* RSR has developed a manual for builders and raters, but there is no data dictionary which defines field names or database mapping processes.

5.3 Program Theory Logic Model Review

This document presents the review of the program theory and logic. Navigant has not received any comments on this draft to date.

5.3.1 Program Theory

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

5.3.1.1 Program Goals

The main goal of the Nicor Gas Residential New Construction program is to achieve therm savings through the construction of high-efficiency new homes. Program qualified homes must be at least 10% more efficient than required by current Illinois residential energy code.

5.3.1.2 Motivating Conditions/Barriers

This program is currently challenged by the depressed market for new construction, as well as the challenges builders already face in trying to meet current energy codes. Although the current code is IECC 2009, Illinois is expected to adopt IECC 2012 by January 2013. The program is making an effort

to keep other participation requirements as consistent as possible with the changing performance targets.

5.3.1.3 Target Audience

The target audience for this program is residential builders in the Nicor Gas and ComEd service territory. The program also targets RESNET certified HERS raters, who will play a large role in recruiting builders to participate in the program.

5.3.1.4 Desired Actions/Behaviors

The program encourages builders to commit to building homes with efficiency levels at least ten percent above code requirements.

5.3.1.5 Strategies/Rationale

Initially, the program will rely heavily on HERS raters to recruit and support builders. The program will offer incentives to both raters and builders. The current incentive levels prioritize raters, but the program expects to shift the bulk of the incentives to builders as it develops. Raters will continue to play an integral role in the program through this transition. The logic outlined in this report focuses on the current program structure.

The program actively recruits HERS raters to participate in the program. The program is doing some active outreach to builders through national and local homebuilders' associations, but will depend on HERS raters' ability to leverage their existing connections with the building community. The program trains both raters and builders on the technical requirements for qualified homes. Raters will be largely responsible for supporting builders through the design and construction of each home.

5.3.1.6 Messages/Communications Vehicles

The Residential New Construction program currently engages in mostly direct marketing to raters and builders. Residential Science Resources (RSR), the implementation contractor, sends representatives to key events such as the Illinois Better Buildings Conference to actively recruit both raters and builders. RSR also hosts training seminars and invites raters and builders to meet in person.

The program also utilizes the umbrella marketing provided by Wisconsin Energy Conservation Corporation (WECC), the Nicor Gas program administrator. WECC generates umbrella marketing materials for all Nicor Gas programs. In addition to these materials, RSR is developing brochures for builders, raters, and prospective homebuyers.

5.3.2 Program Logic Model

This section presents how the Residential New Construction program activities logically lead to desired program outcomes. Figure 5- presents the Nicor Gas and ComEd Joint Residential New Construction Program model diagram showing the linkages between activities, outputs and outcomes, and identifying potential external influences. The diagram presents the key features of the program. The logic diagram presented here is at a slightly higher level than the tables in the report, aggregating some of the outcomes in order to provide an easier-to-read logic model.

The remainder of this chapter presents the resources, activities, outputs, outcomes and associated measurement indicators associated with the Residential New Construction Program.

5.3.2.7 Resources

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

5.3.2.8 Activities

The purpose of the Residential New Construction program is to educate and assist eligible target builders with making their new homes energy efficient. Target builders in the Nicor Gas and ComEd service territories are eligible for the program. The program will reach builders through activities designed to over the longer term generate energy savings (see Table 5-). These activities are as follows:

- Recruit raters to join the program
- Train HERS raters on overall program and program requirements
- Develop informational and marketing collateral, including program branding
 - For raters to give to builders
 - For builders
- Meet with raters and builders one-on-one
- Provide rebates for both raters and builders
- Host recruiting events for builders, leverage homebuilders' associations
- Educate builders about program standards and branding

Table 5-. Program Inputs and Potential External Influences

| Program Inputs |
|--|
| <ul style="list-style-type: none"> • Nicor Gas and ComEd ratepayer funds • Nicor Gas and ComEd staff resources • WECC staff resources and experiences • RSR staff resources and experience • Utility and implementer knowledge of the target market |
| External Influences and Other Factors |
| <ul style="list-style-type: none"> • Economic environment • Energy prices • Federal standards • Perceived need for conservation • Funding available to target builders and raters |

Figure 5-. Program Logic Model

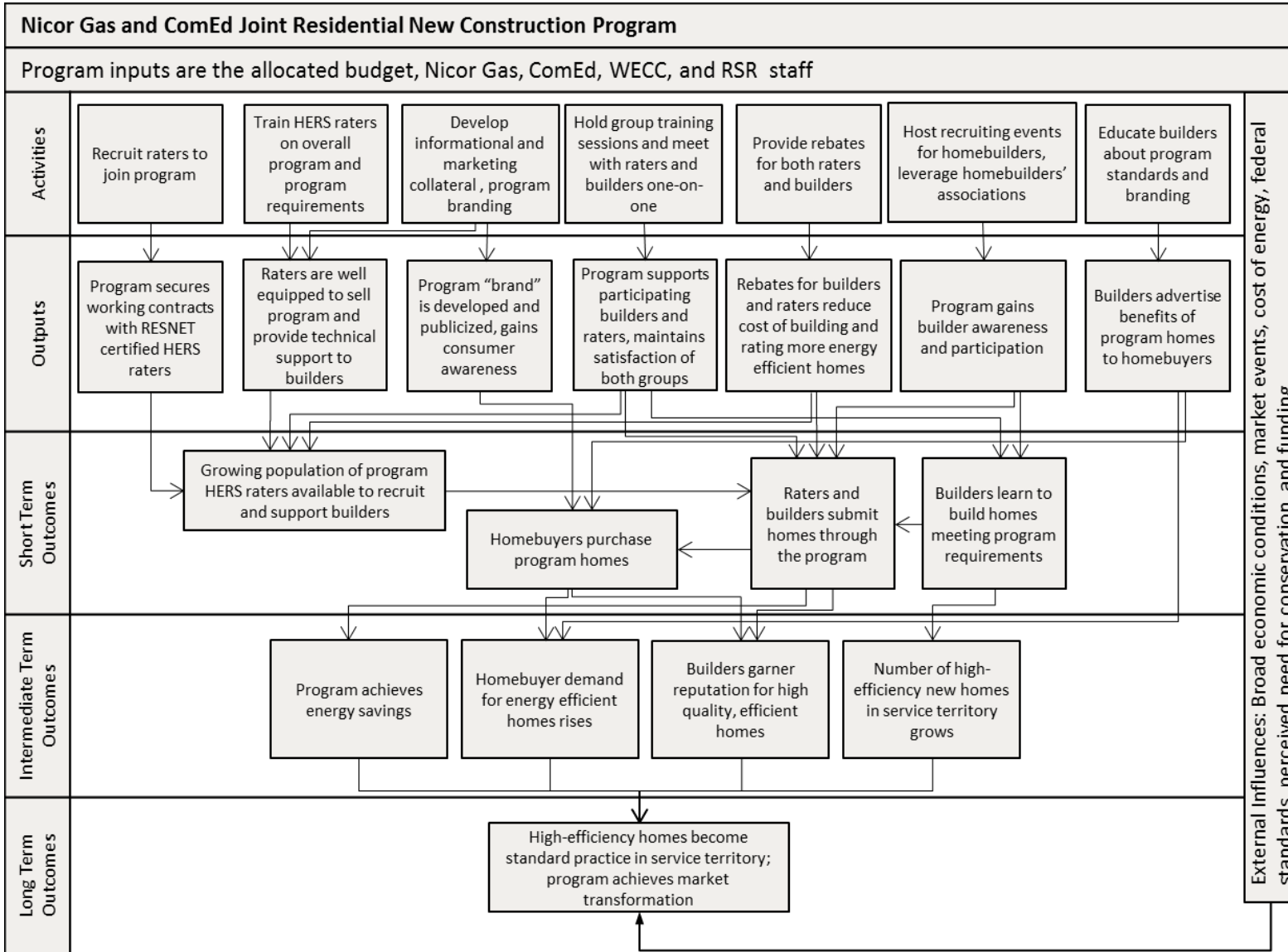


Table 5-. Residential New Construction Program Activities

| |
|---|
| Recruit raters to join the program |
| <ul style="list-style-type: none"> • Implementation contractor reaches out to individual raters in service territory • Implementation contractor present at Illinois Better Buildings conferences • Implementation contractor works with Residential Energy Services Network (RESNET) to reach raters |
| Train HERS raters on overall program and program requirements |
| <ul style="list-style-type: none"> • Raters complete four-hour training on program requirements, database, support system and general information when enrolling in the program |
| Develop informational and marketing collateral, including program branding |
| <ul style="list-style-type: none"> • Nicor Gas program administrator develops umbrella marketing for all Nicor Gas residential programs • Implementation contractor develops brochures for raters, builders, and homeowners • Implementation markets directly to builders and raters through website, direct outreach to individuals • <i>Implementer and program administer work to develop and advertise program branding to help homebuyers identify program homes (recommended)</i> |
| Meet with raters and builders one-on-one |
| <ul style="list-style-type: none"> • Implementation contractor meets personally with raters in recruiting, on ongoing basis once enrolled in program • Implementation contractor meets personally with builders as needed when builders enroll, at a minimum once per year when builder is established in program |
| Provide rebates for both raters and builders |
| <ul style="list-style-type: none"> • Rebate of \$500 per home currently offered to raters • Rebate of \$300 per home currently offered to builders |
| Host recruiting events for builders, leverage homebuilders’ associations |
| <ul style="list-style-type: none"> • Implementation contractor hosts training seminars to engage and educate builders • Implementation contractor leverages national and local homebuilders’ associations (HBAs) to reach builders • Implementation contractor invites builders to meet one-on-one to learn about the program |
| Educate builders about program standards and branding |
| <ul style="list-style-type: none"> • Implementation contractor educates builders and raters about how to achieve program standards: 10% more efficient than current Illinois code • Implementation contractor educates builders on benefits of program homes and program “brand” to assist them in marketing to homebuyers⁹ |

5.3.2.9 Outputs, Outcomes and Associated Measurement Indicators

It is important to distinguish between outputs and outcomes. For the purposes of this logic document, outputs are defined as the immediate results from specific program activities. These results are typically

⁹ The program is working to develop its own “brand.” Some ENERGY STAR equipment is required and can be prescriptively rebated, but ENERGY STAR new home standards are not requisite for program participation.

easily identified and can often be counted by reviewing program records. An example for the Residential New Construction program would be the number of builders or raters recruited to the program. Outcomes are distinguished from outputs by their less direct (and often harder to quantify) results from specific program activities. Outcomes represent anticipated impacts associated with Nicor Gas and ComEd's program activities and will vary depending on the time period being assessed. An example would be energy savings. On a continuum, program activities will lead to immediate outputs that, if successful, will collectively work toward achievement of anticipated short, intermediate and long-term program outcomes.

The following tables list outputs (Table 5-) and outcomes (Table 5-), taken directly from the logic model and associated measurement indicators. For each indicator, a proposed data source or collection approach is presented.

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

| Outputs | Key Performance Indicators | Data Sources and Potential Collection Approaches |
|--|---|---|
| Program secures working contracts with RESNET certified HERS raters | Number of raters contracting with program | Interviews with program staff, program |
| Raters are well equipped to sell program and provide technical support to builders | Number of training sessions held for raters, number of raters able to successfully support builders without assistance from implementation contractor | Interviews with program staff |
| Program “brand” is developed and publicized, gains consumer awareness | Level of homebuyer awareness | Homebuyer surveys, market research, builder and rater surveys |
| Program supports participating builders and raters, maintaining satisfaction of both groups | Training sessions held, marketing materials held, level of positive feedback from program surveys. | Interviews with program staff, print or digital copies of marketing materials, surveys conducted by implementation contractor, builder and rater surveys conducted in evaluation. |
| Rebates for builders and raters reduce cost of building and rating more energy efficient homes | Number of rebates offered and amount of each rebate | Program tracking data |
| Program gains builder awareness and participation | Number of participating builders | Interviews with program staff, program tracking data |
| Builders advertise benefits of program homes to homebuyers | Percent of program homeowners who learned about their home’s efficiency from builders, builders reporting use of program marketing collateral | Homebuyer surveys, builder surveys |

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

| Outcomes | Key Performance Indicators | Data Sources and Potential Collection Approaches |
|---|---|---|
| Short-Term | | |
| Growing population of program HERS raters available to recruit and support builders | Number of active HERS raters in program | Interviews with program staff, program tracking data |
| Homebuyers purchase program homes | Purchase rate or days on market for program homes, program homes' market share in target area | Program tracking data, residential new construction market data |
| Raters and builders submit homes through the program | Number of homes rebated by the program | Program tracking data |
| Builders learn to build homes meeting program requirements | Level of assistance required by builders in program | Rater interviews, interviews with program staff |
| Intermediate-Term | | |
| Program achieves energy savings | Therms, kWh, and kW saved by program homes | Program tracking data |
| Homebuyer demand for energy efficient homes rises | Level of demand observed by builders and realtors, comparative days on market (program and non-program homes) | Builder surveys, homeowner surveys, market data |
| Builders garner reputation for high quality, efficient homes | Builder success, level of program awareness in homebuyers | Builder surveys, homebuyer surveys |
| Longer-Term | | |
| Market share of high-efficiency new homes in service territory grows | Homes rebated by program, non-participant home efficiency, market share of efficient homes | Program tracking data, non-participant surveys or focus groups, market research |
| High efficiency homes become standard practice in service territory; program achieves market transformation | Level of efficiency in new construction market in service territory | Builder interviews, rater interviews, non-participant surveys or Delphi panels |

5.4 *Data Collection Instrument: In-Depth Interview Guide*

Nicor Gas Evaluation

**Program Staff and Implementer In-Depth Interview Guide
(Interviews to be Conducted Separately)**

April 17, 2012

Name of Interviewee: _____ Date: _____
 Title: _____ Company: _____

Role in Program: _____

[Note to Reviewer] The Interview Guide is a tool to guide process evaluation interviews with utility staff and implementation contractors. The guide helps to ensure the interviews include questions concerning the most important issues being investigated in this study. Follow-up questions are a normal part of these types of interviews. Therefore, there will be sets of questions that will be more fully explored with some individuals than with others. The depth of the exploration with any particular respondent will be guided by the role that individual played in the program’s design and operation, i.e., where they have significant experiences for meaningful responses. Where possible, interview date/times will be arranged in advance. The interviews may be audio taped.

Introduction

Hi, may I please speak with [NAME]

My name is ___ and I’m calling from Navigant Consulting, we are part of the team hired to conduct an evaluation of the Nicor Gas _____ program. We’re conducting interviews with program managers and key staff in order to improve our understanding of the program. At this time we are interested in asking you some questions about the Nicor Gas _____ program. The questions will only take about an hour. Is this still a good time to talk? [IF NOT, SCHEDULE A CALL BACK.]
 Ok, great. [Optional: If you don’t mind, I would like to do a voice recording our conversation to speed up the note taking. Is that OK? I’m going to switch you to speaker phone. I am in an enclosed, private office.]

Roles and Responsibilities

1. Can you briefly summarize your role in the Nicor Gas _____ Program: What are your main responsibilities? For how long have you carried these out, including the planning phase? Has your role changed over time?
2. Can you explain who is involved in the program implementation, and what their roles are? [Probe for all significant actors with responsibility in program delivery including implementer, account managers, and program allies.]
3. What other departments at Nicor Gas are involved in/who is responsible for the back-office program services?

- Rebate Processing?
 - Manage Data? / Tracking Targets?
 - Planning and oversight
4. Roughly, how many people are assigned to work on this program? What are your near-term plans for adding staff? From your perspective, is staffing adequate for this program to meet its goal? (If not): What areas/functions do you feel are not adequately staffed?
 5. What are the formal and informal communication channels between these groups (between WECC and _____ (the implementation contractor))? Do you feel information is shared in a timely manner?
 6. Are there any documents, other than what has been provided on the SharePoint site, that outline the roles and responsibilities of program staff for the program? Operations manual, policies and procedures guide? Can we get a copy?

Overall Goals and Objectives

7. Do you think you feel the PY2 goals are realistic? Why or why not?
8. Outside of the quantitative goals (e.g., \$, \$/kWh, savings and participation rates), in your own words, what are the key goals and objectives of this program?

Marketing and Promotion

9. Please describe your program marketing campaign in your own words [If necessary: Do marketing activities vary by prescriptive, custom, government/non-profit? By customer size?]
 - What are the marketing channels that are used?
 - (Bill inserts, TV, newspaper, radio, workshops, community events?)
 - How often does each activity occur?
 - Who is in charge of developing materials?
 - Who is in charge of marketing activities?
 - Do you have a written marketing plan?
10. Is there any additional marketing material that has not been provided on the SharePoint site? If so, can we arrange to get copies of marketing collateral you have used?
11. Do you anticipate making any changes to marketing efforts for Program Year 2 (starting June 1 2013)? If so, please describe these changes.

Trade Allies

12. Could you talk a bit about the program efforts that specifically target trade allies—for this program raters and builders?
13. Is there one staff member that oversees the program rater and/or builder networks? Or staff that specialize in different equipment markets? Lighting, HVAC, Motors, etc.?

14. How are raters and builders recruited for the program(s)? Which types of raters and builders are choosing to participate in the program(s) and which are not?
15. Do you have a sense of builder and rater satisfaction with their participation in the program?
16. What kind of training is provided to them as part of the registration process? What role do they have in marketing the program(s)? What kind of support, if any, is provided to them for marketing the program(s) to their customers?
17. Have raters or builders requested any other types of support/collateral, etc. If so, what have they requested and how are you responding to their requests?
18. Are there any quality control procedures in place for raters or builders? What is done if a complaint is received, for example? Are there any situations where they would be dropped from the program for poor performance?

Program Participation

We are also trying to learn of any process related issues that may arise from the current design of the program(s).

19. Could you briefly describe the process for participation in the program(s) from the customer perspective? Questions include:
 - a. Who drives participation: customer, trade ally, account managers?
 - b. Are customers submitting pre-approval applications even when not required?
 - c. Role of Nicor Gas account managers and customer service?
20. Have you received any feedback from customers on various aspects of the program?
21. What do customers do if they have questions about the participation process? Is there a systematic process in place for responding to customer inquiries? How quickly are their questions answered? What improvements can be made?
22. What is the target review time between receipt of the pre-approval application and letter of approval? What is the average review time? What, if anything, slows down review time?
23. Is there a process in place for communicating to customers the status of their application? Is there any system in place to track project progress? If so, please describe.
24. What is the target processing time between final documentation and payment? What percent of applications are actually processed within that amount of time? What, if anything, slows down processing time?

Incentives

25. What do you perceive to be the level of satisfaction among raters and builders with the current incentive amounts (if applicable, and technical study incentive limit caps)? Are the technical study incentive limit caps being checked for all projects?

Call Center

26. Are raters or builders making use of the phone number to program staff listed on the application form? [Probe for call volume.] What are the main issues raised by raters/builders?

Data Tracking

27. What systems are in place for data tracking? Who captures the data and how?
28. Can you briefly describe what data will be tracked for the program(s)? What about application attachments and calculations? What about review history and revisions to savings or incentive amount?
29. Do you feel all important information is captured and stored in a way to best support program efforts? Is the information accurate and current? Are there additional types of reports or information that you would find beneficial? Is there a process for requesting additional data?
30. Is the system used for data tracking linked with any other systems such as databases with customer account information or ones that track marketing activities?

Quality Assurance and Quality Control (WECC and the IC)

31. Is there any additional documentation, other than what you have provided on the SharePoint site that describes the quality assurance procedures? If so, can we obtain a copy?
32. Can you provide a brief description of your quality procedures? What kind of quality procedures are in place to verify equipment quantities and eligibility? Project completion? What is the process for verifying savings?
33. Approximately, what percentage of all projects is pre-inspected and post-inspected? How do you determine if a project requires inspection (both pre and post)?
34. Who conducts pre and post inspections and how are they documented? Do they use standardized data collection forms? How can we arrange to obtain these documents?
35. When are on-site measurements conducted as part of the pre and post verification? Which measures and business types?

Program Adjustments and Enhancements

36. From your experience to date, are there elements in design, structure, and/or operation that should be modified to make the program(s) work better? If so, what would you recommend? Why do you think this change is needed?
37. Do you feel that free-ridership is a major concern for the program(s)? *[Please explain.]*
38. Do you see this program is leading participants to undertake still additional energy savings projects outside of the Nicor programs? If so, what types of measures or projects?

- 39. Is the program having any impacts on non-participants – driving any increased energy efficient projects or behaviors - that you are aware of?
- 40. Do you think the current economic conditions are affecting the program? If so, how?

Other

- 41. We are also planning on talking to _____ and _____ about this program. Are there any additional people with key roles that we should talk to?
- 42. Do you have any other comments or suggestions for us?

Thank you very much for taking the time in assisting us with this evaluation. Your contribution is a very important part of the process. We might follow-up with you by phone later, if additional questions arise.