



30 South Wacker Drive
Suite 3100
Chicago IL 60606
312.583.5700 phone
312.583.5701 fax

Memorandum

To: Jim Jerozal, John Madziarczyk, Steve Grzenia, Bridgid Lutz, Nicor Gas; Scott Dimetrosky, Apex Analytics; Ted Weaver, First Tracks Consulting; Vincent Gutierrez, Jacob Stoll, Julie Hollensbe, ComEd; Jennifer Hinman Morris, David Brightwell, ICC Staff

From: Laura Tabor, Navigant Consulting

CC: Randy Gunn, Charley Budd, Laura Agapay-Read, Kevin Grabner, Jeff Erickson, Rob Neumann, Josh Arnold, Navigant

Date: February 10, 2016

Re: Joint Residential New Construction Program Net-to-Gross Results

This memorandum presents the net-to-gross (NTG) findings from the Joint Nicor Gas/ComEd Residential New Construction (RNC) program evaluation for gas program year 4 and electric program year 7 (GPY4/EPY7) to be applied in GPY6/EPY9.

Summary of Findings

Navigant conducted interviews with builders and raters who participated in GPY4/EPY7 and GPY3/EPY6 in the winter of 2015 and used data from these interviews to estimate free-ridership, spillover, and NTG for the program. Research included three measure areas: framing and insulation, HVAC, and other. As the table below demonstrates, this resulted in an overall range of NTG estimates from 0.39 to 0.65 for gas and 0.35 to 0.63 for electric, with weighted averages of 0.52 and 0.49, respectively. Table 1 and Table 2 present these results. Given the uncertainty around self-reported NTG results and ongoing program efforts to reduce free-ridership,¹ Navigant recommends using the maximum NTG values for prospective application.

¹ As documented in memorandum from Nicor Gas January 6, 2016.

Table 1. RNC NTG Findings for GPY4/EPY7: Nicor Gas

Measure Area	Participant Spillover	Minimum NTG	Average NTG	Maximum NTG
Framing & Insulation	0.08	0.39	0.51	0.63
HVAC	0.00	0.51	0.66	0.81
Other	0.00	0.34	0.48	0.61
Weighted Average	0.04	0.39	0.52	0.65

Source: Navigant analysis

Table 2. RNC NTG Findings for GPY4/EPY7: ComEd

Measure Area	Participant Spillover	Minimum NTG	Average NTG	Maximum NTG
Framing & Insulation	0.08	0.36	0.48	0.60
HVAC	0.00	0.46	0.63	0.80
Other	0.00	0.30	0.44	0.58
Weighted Average	0.02	0.35	0.49	0.63

Source: Navigant analysis

The gas and electric results differ for two reasons: first, not all builders interviewed work in the ComEd service territory, changing respondent weights. Second, the weight of the different measure areas differs for gas and electric. The weighting methodology is discussed in greater detail below.

These results are lower than the deemed GPY4/EPY7 NTG value of 1.00, which was based on secondary research and approved through a consensus process by the Illinois Stakeholder Advisory Group.² The following factors may have led to a lower NTG for this program than what was found in the secondary research:

Findings

- » Finding 1. RNC programs in jurisdictions with high NTG results generally offer more training to all builders in their market (and some trades), not just to program builders
 - This can lead to market effects from non-participants
- » Finding 2. Code enforcement is high in the Chicago area, leading to generally high efficiency levels in average building practices
 - Builders and raters both noted their expectations for continuing increases in code stringency and a need to look ahead to keep up

² ComEd_NTG_History_and_PY7_Recommendation_2014-02-28_Final_EMV_Recommendations.xlsx, which is found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>. Previously for GPY1/EPY4 through GPY3/EPY6, the NTG recommendation was based on a planning value of 0.80.

- » Finding 3. The program has historically relied on raters to bring builders into the program. This approach may mean the program is more likely to reach builders who are already working with raters and/or using efficient practices
- » Finding 4. Builders may underestimate program influence if they have learned gradually from their raters over time: Many reported a smooth transition to new code and program requirements, but may not have accounted for the fact that raters’ support in prior year likely helped prepare them for these transitions.

Based on these findings, Navigant offers the following recommendations for the program to consider to improve NTG in the future:

- » Recommendation 1. The program may want to consider offering broader builder trainings to get exposure beyond program participants and attract a wider cross-section of the market. Doing so could lead to market effects from non-participants, which if measured would increase spillover and NTG.
- » Recommendation 2. The program should continue to emphasize higher efficiency tiers in the new tiered program structure to move away from low-hanging fruit. This could push builders to go beyond “easy” improvements to their homes and reduce free-ridership for the higher efficiency tiers. upper end of the researched NTG range (0.63).
- » Recommendation 4. Consider alternative evaluation approaches such as a Delphi panel or incorporating non-participant interviews in future NTG research.

Methodology

Navigant interviewed a total of twelve builders and six raters representing 45 percent and 67 percent of homes in the GPY4/EPY7 program, respectively (Table 3). Three of the builder interviewees represented nearly 80 percent of the interviewed builders’ homes; however, the overall program participation is heavily skewed towards a small number of builders as well. In GPY4/EPY7, the top five (of 38) builders represented 80 percent of program homes.

Table 3. Sample Summary

	GPY4/EPY7 Population	Completed Interviews	Share of GPY4/EPY7 Homes Represented
Builders	38	12	45%
Raters	11	6	67%

Source: Navigant analysis of program tracking data

For the NTG evaluation, Navigant asked builders and raters about builders’ efficient building practices in three areas, shown in Table 4. Interviewers asked questions for each measure area, using the individual practices and measures listed as examples and prompts for interviewees. Please see the appendix for complete builder and rater interview guides.

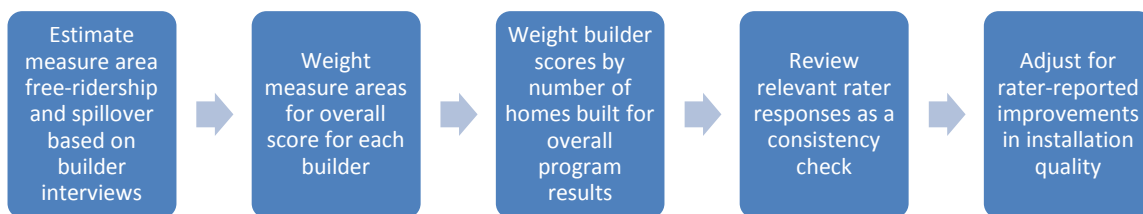
Table 4. Measure Areas Covered in In-depth Interviews with Builders and Raters

Measure Area	Specific Building Practices/Measures
Framing & Insulation	Air Sealing all Penetrations
	Capping Chases
	Using 2x6 framing and/or rigid foam insulation
	Backing Knee Walls
	Insulation in Full Contact w/ Air Barrier
HVAC	Proper Sizing
	Duct Leakage / Sealing, Duct Tightness Testing
	Pressure Balancing
	Proper RC&AF
Other Equipment	High Efficiency Central Air Conditioning (SEER \geq 14.5)
	ECM Furnace Fan
	ENERGY STAR® Refrigerator or Exhaust Fan
	100% CFL Lighting
	Power-vented Water Heater (EF \geq 0.62)
	High Efficiency Furnace (AFUE \geq 92%)

Source: Navigant analysis

The methodology to estimate a program level NTG estimate used the following steps, as described in Figure 1 below.

Figure 1. Residential New Construction NTG Methodology



Builder Interview Analysis

Navigant used the following questions—within a NTG battery including additional questions to provide context—to estimate the market share of homes using certain high efficiency practices both inside and outside of the program.

- » Question 1:
 - » (If builder reports all homes built to significantly exceed IECC 2012) What percent of homes built by other builders to meet but not significantly exceed IECC 2012 do you estimate use this measure/technique?
 - » (If builder reports some or no homes built to significantly exceed IECC 2012): Think about your homes that are built to meet but not significantly exceed code. In how many of them do you incorporate this measure?
- » Question 2: What percent of the homes that you submitted to the program in the past year used this practice/measure?
- » Question 3: What percent of the homes you've built in the past year that you did not submit to the program used this practice/measure?

These questions, in combination with asking builders what share of their homes go through the program, allowed the team to calculate both the “naturally occurring” share of high-efficiency for a given measure group (Question 1)—which serves as an estimate for the level of efficiency which would occur throughout the market without the program—and the share of high efficiency occurring in the program and outside of the program in the present market.

Table 5. Mapping of NTG Questions to Market Share Estimates, With and Without Program

Percent of Sales	Without Program	With Program
Standard Efficiency	1 – Question 1	Calculated based on Questions 2 & 3, and percent of homes in program
High Efficiency, <i>Outside Program</i>	Question 1	
High Efficiency, <i>in Program</i>	n/a	

Source: Navigant analysis

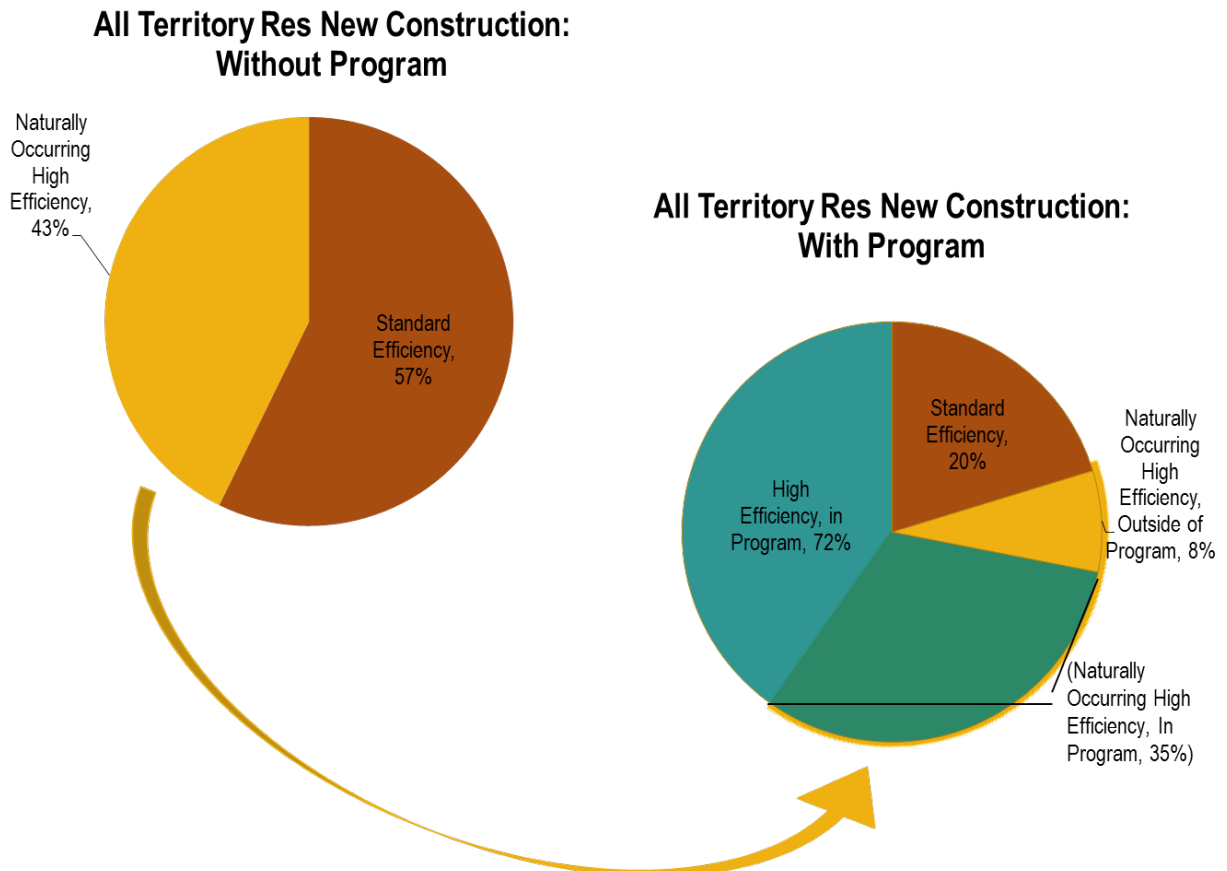
If the total amount of high efficiency measures outside of the program *increases* with the program, there may be spillover: the program may have influenced this change. A decrease in high efficiency measures outside of the program indicates free ridership (previously unincented activity becoming incented). Assuming that the program is the sole influence of the increase in high efficiency seen within the program, the minimum free-ridership (FR) is calculated as the portion of “naturally occurring” high efficiency measures absorbed by the program divided by the total amount of high efficiency in the program:

$$\text{Estimate of Minimum FR} = \frac{\text{Change in High Efficiency Outside of Program}}{\text{High Efficiency Homes in Program}}$$

This is shown visually in Figure 2 with example data: The yellow portion of the left-hand chart represents the naturally occurring level of high efficiency in the absence of the program; some portion of this (yellow-green) is absorbed by the program, additional high efficiency adoption occurs within the program (green), and some naturally occurring high efficiency remains outside of the program. If

the share of high efficiency outside of the program *grows* between the “without program” case and the “with program” case, the equation above becomes one for maximum spillover.

Figure 2. Illustration of Free-Ridership Calculation



Source: Navigant analysis. Note: “Naturally Occurring High Efficiency, In Program” is a subset of “High Efficiency, in Program.”

As noted above, this calculation represents the minimum free-ridership because it assumes that the program is the sole cause for any increases in high efficiency practice adoption. Navigant estimated the maximum free-ridership using builders’ reported influence from the program through the following questions:

- » Question 4: On a scale from 0 to 10, where 10 is very influential and 0 is not at all influential, how important would you say the program was in your decision to use this measure/practice in homes you submitted to the program
- » Question 8: On a scale from 0 to 10, where 10 is very influential and 0 is not at all influential, how important would you say the program was in your decision to use this measure/practice in more homes outside of the program?

The evaluation team used a series of runs with the gross impact simulation models to estimate the share of savings for each measure area. The team used the model for the most common home type, a two-story detached home for the following runs:

- Final model with code level insulation and infiltration (estimates framing and insulation savings as percent of total)
- Final model with code level duct sealing and insulation (estimates HVAC savings as percent of total)

The team allocated the remaining share of savings to the Other category.

Table 6 and Table 7 summarize the free-ridership results for builders.

Table 6. Builder Free-Ridership Findings: Nicor Gas

Measure	Minimum FR	Maximum FR	Average FR	Measure Weight
Framing & Insulation	0.50	0.75	0.63	56%
HVAC	0.23	0.53	0.38	15%
Other	0.39	0.66	0.52	29%
Weighted Average	0.43	0.69	0.56	100%

Source: Navigant analysis

Table 7. Builder Free-Ridership Findings: ComEd

Measure	Minimum FR	Maximum FR	Average FR	Measure Weight
Framing & Insulation	0.53	0.77	0.65	31%
HVAC	0.26	0.59	0.43	22%
Other	0.42	0.70	0.56	47%
Weighted Average	0.42	0.70	0.56	100%

Source: Navigant analysis

In addition, one builder reported spillover in the framing and insulation area, yielding seven percent spillover in that measure area.

Rater Interview Analysis

The team reviewed the rater responses for each of the measure responses and compared to the builder responses to parallel questions. Rater responses were generally consistent with builder responses.

Navigant also asked raters whether builders’ implementation of high efficiency practices had improved in the framing and insulation and HVAC measure areas using the following questions:

“Now I want you to think about how well the builders you work with implemented these techniques prior to their experience in the program, and now that they have participated in the program.

- a. At the beginning would you say their implementation was...
 - i. Excellent
 - ii. Good
 - iii. Fair
 - iv. Poor
 - v. Not using technique
- b. Now, would you say their implementation was...
 - i. Excellent
 - ii. Good
 - iii. Fair
 - iv. Poor
 - v. Not using technique”

No raters reported “not using technique;” thus the team assigned scores to the four remaining response options as follows:

Table 8. Rating Scale for Builder Implementation

Rating	Score
iv. Poor	0.00
iii. Fair	0.33
ii. Good	0.67
i. Excellent	1.00

Source: Navigant analysis

Navigant used the building simulation impact models to estimate the impact of improved installation quality for both framing and insulation and HVAC:

- Framing insulation: Modeled effect of improving from Grade 3 to Grade 1 insulation³ as a percentage of overall savings.
- HVAC: Modeled effect of limiting duct sealing to code maximum leakage

Navigant did not make an adjustment for the Other category as it includes mostly prescriptive equipment measures for which savings do not vary with installation practices as much. The team then used the weighted average pre-and post-program implementation scores to determine the percent savings to add to the program NTG.

³ Standard insulation installation grades range from one to three, with Grade 1 insulation being the highest quality installation.

Table 9. Summary of Rater Adjustment Calculations: Nicor Gas

Measure Area	Estimated Installation Quality Savings	Weighted Average Score Before Program	Weighted Average Score After Program	Weighted Average Improvement	Net Improvement Savings
Framing & Insulation	12%	0.28	0.81	0.53	6.3%
HVAC	14%	0.43	0.72	0.29	4.1%

Source: Navigant analysis

Table 10. Summary of Rater Adjustment Calculations: ComEd

Measure Area	Estimated Installation Quality Savings	Weighted Average Score Before Program	Weighted Average Score After Program	Weighted Average Improvement	Net Improvement Savings
Framing & Insulation	10%	0.28	0.82	0.54	5.3%
HVAC	21%	0.45	0.72	0.27	5.7%

Source: Navigant analysis

The team added this net improvement savings to the NTG by subtracting the percentages from the weighted average builder free-ridership scores for these measure areas, reducing gas free-ridership by 6.3 percent and 4.1 percent, respectively and electric free-ridership by 5.3% and 5.7%, respectively.

Table 11. Free-ridership Findings with Rater Adjustment: Nicor Gas

Measure	Minimum FR	Average FR	Maximum FR	Measure Weight
Framing & Insulation	0.44	0.56	0.68	56%
HVAC	0.19	0.34	0.49	15%
Other	0.39	0.52	0.66	29%
Weighted Average	0.39	0.52	0.65	100%

Source: Navigant analysis

Table 12. Free-ridership Findings with Rater Adjustment: ComEd

Measure	Minimum FR	Average FR	Maximum FR	Measure Weight
Framing & Insulation	0.47	0.60	0.72	31%
HVAC	0.20	0.37	0.54	22%
Other	0.42	0.56	0.70	47%
Weighted Average	0.39	0.53	0.67	100%

Source: Navigant analysis

Final Results

Using the adjusted free-ridership results and spillover findings, Navigant estimated the following NTG for the program.

Table 13. RNC NTG Findings for GPY4/EPY7: Nicor Gas

Measure Area	Participant Spillover	Minimum NTG	Average NTG	Maximum NTG
Framing & Insulation	0.08	0.39	0.51	0.63
HVAC	0.00	0.51	0.66	0.81
Other	0.00	0.34	0.48	0.61
Weighted Average	0.04	0.39	0.52	0.65

Source: Navigant analysis

Table 14. RNC NTG Findings for GPY4/EPY7: ComEd

Measure Area	Participant Spillover	Minimum NTG	Average NTG	Maximum NTG
Framing & Insulation	0.08	0.36	0.48	0.60
HVAC	0.00	0.46	0.63	0.80
Other	0.00	0.30	0.44	0.58
Weighted Average	0.02	0.35	0.49	0.63

Source: Navigant analysis

Appendix: Interview Guides

**Nicor Gas and Commonwealth Edison
Joint Residential New Construction Program
Builder Interview Guide—GPY4/EPY7**

Screener

Hi, may I please speak to _____? My name is ____ and I'm calling from Navigant Consulting on behalf of Nicor Gas and ComEd and their Residential New Construction program that is implemented by Residential Science Resources (RSR). We are talking to builders who participated in the Residential New Construction program to gather feedback on the program. This is not a sales call. I would like to talk with you for about 20 minutes to help assess the program based on your experience with it. We are hoping you can give us insights on your experience that will help identify improvements in the program and its support to you as a participating builder in the program.

[If needed: We received your name from RSR and are authorized to make these calls. You can verify our credentials by contacting Mike Topitzhofer at RSR at 651-200-3417.]

Would you like to do the interview now or is there a better time that we can schedule for this?

Date: _____ **Time:** _____

And should we call you back at the same phone number?

IF NO → **Alternate Phone #:** _____

First, I'd like to confirm that you are a primary decision maker for your firm. Is that correct?

Yes ____

No ____

Refused/unsure/don't know ____

[If No or Refused/unsure/don't know:]

We need to speak with a primary decision maker who determines whether to participate in the program, and is responsible for incorporating energy efficiency improvements into your company's new home projects. Would you please put me in touch with that person?

[If willing to refer to other person, get that person's contact information and restart the interview process with that other person. Acknowledge you were referred by the initial contact person.]

[Confirm name and title; proceed to Introduction]

[If directed to a voice mail system:]

Hello, my name is _____. I'm calling from Navigant Consulting on behalf of Nicor Gas and ComEd and their Residential New Construction program that is implemented by Residential Science

Resources (RSR). We are talking to builders who participated in the Residential New Construction program to gather feedback on the program. I would like to talk with you for about 20 minutes to help assess the program based on your experience with it. I will continue trying to get hold of you directly, but meantime if you wish, feel free to call me back at your earliest convenience to schedule the interview. My phone number is _____ [*repeat phone number for clarity*]. Thank you in advance for your cooperation, as we greatly value your thoughts on the program. I look forward to talking with you. Goodbye.

I. INTRODUCTION

Ok, thanks for taking time to talk with me about the program. We'll discuss your experience during the current program year which began in June 2013, so keep that in mind as we talk.

1. Since June 1, 2014, roughly how many homes **in total** did your company build altogether?
[*An approximate number is ok.*]

2. I realize that you may not build only in Nicor Gas and ComEd service territory. About what percentage of that total, roughly, was built in Nicor Gas and ComEd territory?

% _____ Nicor Gas and ComEd

% _____ Nicor Gas only

% _____ ComEd only

[*Calculate #: _____*]

[IF RESPONDENT BUILDS HOMES OUTSIDE OF NICOR GAS / COMED TERRITORY] For the remainder of our conversation, please do your best to keep your responses focused only on your company's activity in the Nicor Gas / ComEd service territory. [INTERVIEWER SHOULD BE PREPARED TO SUMMARIZE WHAT THE TERRITORY INCLUDES.]

3. About what percentage of the homes your company built in this program year to date were production (spec-built) homes, and what percentage were custom-built homes?

% Production/Spec _____

% Custom _____

4. Before participating in the program, did you have any homes rated by a HERS rater?
 - a. If yes, what percent? About what HERS score did they typically achieve? A range or average value is ok.
5. Our records show that you built [xx] homes through the program so far this year. Approximately what % of all the homes you built in the Nicor/ComEd service territories does this represent?

II. NET-TO-GROSS

Next I'd like to talk about how your participation in the program has affected your building practices. Remember to think specifically about homes that you have built in the Nicor Gas and ComEd service territories. For these questions, I'd also like you to focus on homes you've built under the IECC 2012 code.

1. Overall, how important is the Nicor Gas and ComEd New Construction program, including rebates and program technical support, in your decision to build homes at least 20% more efficiently than code?
 - a. 1 Very important
 - b. 2 Somewhat important
 - c. 3 Not too important
 - d. 4 Not at all important

2. If Nicor Gas and ComEd did not offer the New Construction program, would you build the same number of homes at least 20% more efficient than code, fewer homes, or more homes? [double check if same or more]
 - a. Same
 - b. Fewer
 - c. More

3. If you would not have built homes to qualify for an incentive through the program, how would the homes you built have been different? [PROBE FOR SPECIFIC CONSTRUCTION PRACTICES THAT DIFFER]
 - a. Less efficient
 - b. Meeting other energy efficient certification (Energy Star, etc)

Now I'd like to ask some questions about specific energy saving building practices and measures that you may be using in your homes, including framing, insulation, HVAC and some additional equipment categories.

4. Before we get into the details, would you say that all, some, or none of the homes you build outside the program exceed the IECC 2012 code? [Clarify if necessary: building specifically to exceed code, rather than just trying to meet it]

[Repeat for each major section. Use detailed measures as prompts for examples of advanced framing techniques, insulation levels, HVAC installation techniques, and high-efficiency equipment.]

	Measure Type
Framing & Insulation	Air Sealing all Penetrations
	Capping Chases
	Using 2x6 framing and/or rigid foam insulation
	Backing Knee Walls
	Insulation in Full Contact w/ Air Barrier
HVAC	Proper Sizing
	Duct Leakage / Sealing, Duct Tightness Testing
	Pressure Balancing
	Proper RC&AF
Other Equipment	High Efficiency Central Air Conditioning (SEER ≥ 14.5)
	ECM Furnace Fan
	ENERGY STAR® Refrigerator or Exhaust Fan
	100% CFL Lighting
	Power-vented Water Heater (EF ≥ 0.62)
	High Efficiency Furnace (AFUE ≥ 92%)

For each measure category: I'd like you to think about how often you incorporated these measures/techniques in your homes, both before and after you started participating in the program.

5. [If II.4 = All] Think about the typical home you built before the IECC 2012 code came into effect.
 - a. Would these homes have met IECC 2012 code without any changes to your building practices for this measure/area?
 - b. What percent of homes built outside the program by other builders to meet but not significantly exceed IECC 2012 do you estimate use this measure/technique?

[If II.4 = Some or None]

- a. For your non-program homes that don't significantly exceed code, did you have to change your typical practices in this area to consistently meet the new code?
 - b. Thinking about your non-program homes that are built to meet but not significantly exceed code, in how many of them do you incorporate this measure/practice?
6. Of the homes that you **submitted** to the program this year, in what percent did you incorporate these practices/measures?
7. [Skip this question if I5 = 100%] Of the homes that you did **not submit** to the program this year, in what percent did you incorporate these practices/measures?
8. [Skip this question if I5 = 100%] Based on those answers, it sounds like you used these measures/practices in about XX% of all of the homes you built this year. Does that sound about right? *If not, adjust answers to #2 and #3 accordingly.*

9. Did the program increase your knowledge of how to implement these measures/practices?
10. *If #2 > #1*: On a scale from 0 to 10, where 10 is very influential and 0 is not at all influential, how important would you say the program, including your HERS rater, was in your decision to the these measures/practices in homes that you submitted to the program? [If necessary, clarify that you mean use beyond “just meeting code” as specified in #1]
11. *If #3 > #1*: On a scale from 0 to 10, where 10 is very influential and 0 is not at all influential, how important would you say the program, including your HERS rater, was in your decision to use these measures/practices in more homes outside of the program?
12. What other factors, if any, contributed to the increase of your use of these measures/practices?
13. *If decrease calculated*: It sounds like you have decreased your use of these measures/practices in your homes. What factors have caused this decrease?
14. Have you had any problems with your subcontractors getting up to speed on this measure? Please describe:

IV. MARKET FACTORS

Now I'll ask how the program got you involved through its builder development effort, and your experience with the marketing and sales training and support the program has provided.

1. What was the main reason you got involved in the program? Was there a recruitment tactic the program used that was particularly compelling to you? Are there any program outreach and recruitment strategies the program uses that you think could benefit from improvement?
2. How **effective** has the program been overall in raising builders' awareness about strategies and opportunities for achieving significantly higher efficiency in new homes? [*Probe: How about your company's awareness of these strategies?*] **Please rate the program on a scale from zero to ten, where zero is very ineffective and ten is very effective.**
3. To the best of your knowledge, how **effective** has the program been overall in raising *customers'* awareness about achieving significantly higher efficiency in new homes? **Please rate the program on a scale from zero to ten, where zero is very ineffective and ten is very effective.**
 - a. What things stand out to you in saying that (good or bad)? [*Probe for additional.*]
 - b. What barriers has the program addressed most effectively – including both barriers to builders participating in the program as well as barriers to customers buying homes built by participating builders like you? [*Probe for additional.*]

4. [if I5 < 100%,] What would it take for you to build 100% of your IECC 2012 homes to program specifications?
5. Do you see your company's efforts to build high efficiency, program-eligible homes as a competitive differentiator between you and other builders? Why or why not? Do you have any thoughts on the advantages or disadvantages of advertising a home as energy efficient?
 - a. How would you describe the level of customer demand for higher efficiency new homes? [*Probe: high, low, moderate*]
 - b. If you have participated in the program previously, would you say demand for higher efficiency homes has increased, decreased, or stayed the same?
 - c. [If I6c < 100%] For homes that are not custom-built, do you find that there is any difference in time on the market between standard homes and high-efficiency program homes? If so, what are typical times on the market for each?
 - d. From your perspective, how receptive are realtors and appraisers to attributing added value to high-efficiency, program-qualified homes (e.g., lower energy bills, comfort or other benefits the program promotes)? Have you observed changes in the level of knowledge and awareness of the realtor and appraiser community during the last year, and to what extent would you attribute that change to the program's efforts?

V. RELATIONSHIP WITH HERS RATERS

1. Do you work with any HERS raters on homes outside of the program?
2. Do you feel that you are better qualified to build program-eligible homes as a result of your interactions with *program* HERS raters?
 - a. What areas do program HERS raters help you the most with? Where have you learned the most from them?
 - b. [if I6c < 100%,] Have program HERS raters helped you to meet the new IECC 2012 code in homes outside of the program?
3. Overall, how satisfied have you been with your relationship with HERS raters in the program? **Please rate your experience on a scale from zero to ten, where one is very ineffective and four is very effective.**

VI. PROGRAM REQUIREMENTS AND TECHNICAL SUPPORT

Let's talk about your experience with the program's technical requirements and technical support.

1. Do you feel that the program has clearly communicated participation requirements to you?
2. How has the change in the program's efficiency requirements from 10% above code to 20% above code affected your participation?

3. What do you think of the program's eligibility requirements for construction standards and quality assurance? Do you have any major concerns or insights? Please explain.
4. What strengths and weaknesses have you experienced with the program's inspection processes? Have any inspections caused delays in the construction schedule?
5. Have you attended any program trainings or made use of program technical support? If no, why not? If yes, what have you been able to learn from the program technical training and/or support?
6. What was your experience with Illinois' residential energy code moving from IECC 2009 to IECC 2012?
 - a. Has the program helped you to learn about IECC 2012?
 - b. How has the new code changed the extent to which the program drives incremental improvements in energy efficiency? Are there certain areas (e.g., building envelope or HVAC) in which the code is particularly lax or stringent, and where the program makes a big difference in improving efficiency over code?
 - c. How strong do you think energy code enforcement is in the area(s) where you work?
 - d. Outside of the program, do you typically use the prescriptive or performance path for compliance?
7. How satisfied have you been with your interaction with program staff? *Clarify if needed: RSR staff, not your HERS rater. Please rate your experience on a scale from zero to ten, where zero is very ineffective and ten is very effective.*

VIII. WRAP UP

1. Overall, how satisfied are you with the program at this point? Please rate your experience on a scale from zero to ten, where zero is very dissatisfied and ten is very satisfied. Why did you give that rating?
2. From your perspective, what changes can be made to improve the program or to make participation in program more compelling for you and other builders?

Those are all the questions I have. Thank you very much for your time and help! Have a good day.

**Nicor Gas and Commonwealth Edison
Joint Residential New Construction Program
Rater Interview Guide – GPY4/EPY7**

Screenener

Hi, may I please speak to _____? My name is ____ and I'm calling from Navigant Consulting on behalf of Nicor Gas and ComEd and their Residential New Construction energy efficiency program. We are talking to HERS raters who participated in the Residential New Construction program to gather feedback on the program. This is not a sales call. I would like to talk with you for about 20 minutes to help assess the program based on your experience with it. We are hoping you can give us insights on your experience that will help identify improvements in the program and its support to you as a participating rater in the program.

[If needed: We got your name from Residential Science Resources (RSR) and are authorized by Nicor Gas and ComEd to make these calls. You can verify our credentials by contacting Mike Topitzhofer of Residential Science Resources at 651-200-3417.]

Would you like to do the interview now or is there a better time that we can schedule for this?

Date: _____ **Time:** _____

And should we call you back at the same phone number?

IF NO → **Alternate Phone #:** _____

[Confirm name and title; proceed to Introduction]

[If directed to a voice mail system:]

Hello, my name is _____. I'm calling from Navigant Consulting on behalf of Nicor Gas and ComEd and their Residential New Construction energy efficiency program. We are talking to HERS raters who participated in the Residential New Construction program to gather feedback on the program. I would like to talk with you for about 20 minutes to help assess the program based on your experience with it. I will continue trying to get hold of you directly, but meantime if you wish, feel free to call me back at your earliest convenience to schedule the interview. My phone number is _____ *[repeat phone number for clarity]*. Thank you in advance for your cooperation, as we greatly value your thoughts on the program. I look forward to talking with you. Goodbye.

I. Introduction/Program Satisfaction

1. How long have you participated in the NICOR GAS AND COMED program for residential new construction? When did you first get involved?
2. What percent of your business occurs in the Nicor Gas and ComEd service territory?
 - a. Nicor Gas and ComEd:
 - b. Nicor Gas only:
 - c. ComEd only:

3. Of the work you do in the Nicor Gas and ComEd service territory, what percent is through the program? Do you work with builders who do not participate in the program?
4. Do you participate in other utility energy efficiency programs? If yes, which ones?

II. Experience with builders in program

1. At what point in the plan development process do you typically begin interacting with builders for each home?
PROBE FOR % of cases in which they get involved:
 - a. During the initial design phase
 - b. During the design review phase, prior to design completion
 - c. After the design is finalized
 - d. Is this different for custom vs. production homes?
2. In your experience, what percentage of home plans submitted by builders participating in the program achieve a program-qualifying level of efficiency upon your initial review of the plan and through actual construction? If you are familiar with markets in other parts of the country, how do you think this compares to experiences in other regions of the country? Use probes below as needed:
 - a. What percentage of initial home plans do you estimate would initially pass IECC 2012?
 - b. In the cases where a home does not achieve a qualifying level of efficiency (for the program or IECC 2012 code) upon your initial review, how would you characterize the extent to which plans require revisions? [PROBE: Significant revisions required, moderate revisions required, minor revisions required] What are the most common plan failings? [PROBE: Thermal bypass checklist issues, Window to wall ratio, Insulation levels, HVAC system, etc] How many iterations of the plan/phases of construction are typically needed?
 - c. To what degree do home builders use you as a resource for addressing issues associated with meeting the requirements specified in approved plans? Specifically, after the plans are approved how frequently do you interact with the builder during the construction phase? Is it more than just during the inspections? Is there regular consultation provided to builders on each home design? What is the nature of these interactions?
 - d. What percentage of the builders that participate in the program needed to make changes to their standard/established construction practices to build homes that meet program standards? What about to meet IECC 2012 code alone? [Probe for code compliance of builders outside program as well] Excluding changes to the original plans, how would you characterize the magnitude of the changes to construction practices that builders must make to build homes that meet program standards? (Major, minor, none) [Keep this discussion short and high-level; if needed say that we will discuss specifics of these changes in the next section]

3. Are there areas the program could focus on encouraging more substantial changes in building practices (e.g., insulation, air sealing, ducts, etc.) that would help position the builders to keep pace with and go beyond the new IECC 2012 code and program requirements through additional trainings, relationships with trade allies, etc.?
4. Do the builders who work with you through the program recognize your support as a benefit of participating in the program?

III. Net-to-Gross

I'd like to talk now about some specific building practices that you might be helping program-participating builders with. I want you to think about how often and how well the builders that you work with used these practices when you first started working with them in the program, and how often and how well they are using them today after the first program year, on program homes and non-program homes. Remember to think about just builders that you work with in the Nicor Gas and ComEd program territory.

Framing & Insulation

2. Now I'd like to talk about framing, air sealing and insulation.
 - a. In what percent of homes do you see builders using advanced framing and proper air sealing and insulation techniques consistent with the Thermal Bypass Checklist outside of the program? Is this different for program and non-program builders?*[If needed, prompt with practices below]*
 - b. In what percent of program homes do you see them using these techniques now?
 - c. What are typical insulation R-values in builders' homes outside of the program?
Probe for walls, attic, foundation, 2x6 vs 2x4 framing.
 - d. What are typical R-values in program homes? Has installation of insulation improved?

Framing, Air Sealing & Insulation	Air Sealing all Penetrations
	Capping Chases
	Using 2x6 framing and/or rigid foam insulation
	Backing Knee Walls
	Insulation in Full Contact w/ Air Barrier

3. Now I want you to think about how well the builders you work with implemented these techniques prior to their experience in the program, and now that they have participated in the program.
 - a. At the beginning would you say their implementation was...
 - i. Excellent
 - ii. Good
 - iii. Fair
 - iv. Poor
 - v. Not using technique
 - b. Now, would you say their implementation was...
 - i. Excellent
 - ii. Good
 - iii. Fair

- iv. Poor
 - v. Not using technique
4. (If noted improvement and/or increase in use of techniques) On a scale from 0 to 10, where 0 is not at all influential and 10 is very influential, how important do you think the program was in this improvement in advanced framing and air sealing techniques among the builders you work with? [PROBE FOR SPECIFIC WAYS IN WHICH THE PROGRAM HAD AN INFLUENCE, E.G., INCREASED KNOWLEDGE THROUGH TRAININGS, EDUCATIONAL MATERIALS, EXPOSURE TO VENDORS OFFERING EFFICIENT PRODUCTS, ETC.]

HVAC

1. Now I'd like to talk about HVAC.
- a. In what percent of homes do you see builders using the following practices when specifying and installing HVAC systems outside the program? Is this different for program and non-program builders?
 - b. In what percent of homes do you see them using these practices in the program?

HVAC	Proper Sizing
	Duct Leakage / Sealing, Duct Tightness Testing
	Pressure Balancing
	Proper RC&AF

2. Now I want you to think about how well the builders you work with implemented these practices prior to their experience in the program, and how well they implement them now.
- a. At the beginning, would you say their implementation was...
 - i. Excellent
 - ii. Good
 - iii. Fair
 - iv. Poor
 - v. Not using technique
 - b. Now, would you say their implementation was...
 - i. Excellent
 - ii. Good
 - iii. Fair
 - iv. Poor
 - v. Not using technique
3. (If noted improvement and/or increase in use of practices) On a scale from 0 to 10, where 0 is not at all influential and 10 is very influential, how important do you think the program was in this improvement in HVAC installation practices and duct sealing among the builders you work with? [PROBE FOR SPECIFIC WAYS IN WHICH THE PROGRAM HAD AN INFLUENCE]

Other Equipment

1. Now I'd like to talk about some other high-efficiency equipment.

- a. In what percent of homes do you see builders installing the following high-efficiency equipment when they first entered the program? Is this different for program and non-program builders?
- b. In what percent of homes do you see them installing this equipment in the program?

Equipment	High Efficiency Central Air Conditioning (SEER 14.5)
	ECM Furnace Fan
	ENERGY STAR® Refrigerator or Exhaust Fan
	100% CFL Lighting
	Power-vented Water Heater (0.62 EF or higher)
	High Efficiency Furnace (92% AFUE or higher)

2. (If noted increase in use of equipment) On a scale from 0 to 10, where 0 is not at all influential and 10 is very influential, how important do you think the program was in this improvement in high efficiency equipment installations among the builders you work with? [PROBE FOR SPECIFIC WAYS IN WHICH THE PROGRAM HAD AN INFLUENCE]

5. If the program was not available now, do you think builders would construct homes equal to the program's standards? If no, how close do you think they would come? Once involved in the program, do you see builders translating these building practices to non-program homes? If yes, which ones and to what extent?

IV. Wrap Up

1. I'd like you to rate your satisfaction with the following aspects of Nicor Gas and ComEd program on a scale from zero to ten, where zero is dissatisfied and ten is satisfied.
 - a. Application and payment process
 - b. Marketing support
 - c. Tracking system (HouseRater)
 - d. Training and technical support
2. [FOR ANY EXTREMELY HIGH OR LOW VALUES] Can you comment on why you gave the ratings that you did?
3. From your perspective, what changes can be made to improve the program?

Those are all the questions I have. Thank you very much for your time and help! Have a good day.