

# Business New Construction Program EPY7/GPY4 Evaluation Plan

## Introduction

To date, the Business New Construction program has been jointly offered by Commonwealth Edison (ComEd) and Nicor Gas. The ComEd program has been operating since June 1, 2009. Nicor Gas joined the program to offer natural gas rebates in June 2011. Initial discussions with program staff in March 2015 indicate that there will be some changes in the gas portion of program in future years. First, Nicor Gas stopped accepting new gas projects in December 2014. Second, beginning in ComEd's Electric Program Year (EPY8 or PY8), Nicor Gas, Peoples Gas and North Shore Gas will coordinate with the program by purchasing therm savings that are identified by ComEd during PY8. As these changes are still in their initial stages, updates to the program's design will be reflected in evaluation plans for future program years.

This plan covers the seventh program year (EPY7 or PY7) of ComEd's electric savings and the fourth program year for Nicor gas savings (GPY4).<sup>1</sup> Seventhwave, formerly the Energy Center of Wisconsin, implements the program for ComEd and Nicor Gas.

This evaluation plan reflects new evaluation approaches designed specifically for the unique characteristics of this program and which originated in discussions between the implementation and evaluation teams over the course of the past several years. The primary objectives of this evaluation is as follows:

- Provide adjusted gross impacts for all projects using a combination of verified and researched realization rates;
- Provide verified net savings for all projects completed in EPY7/GPY4; and
- Use a "real time" approach for the eventual derivation of NTGR, interviewing project representatives as they enter the Reservation Stage and again as projects are completed.<sup>2</sup>

## Joint Evaluation Approach

This plan outlines the evaluation objectives and activities for the program and how results pertain to each utility. In an effort to recognize the singular nature of the joint program, the evaluation team will synthesize process findings from each utility into a single set of findings. The impact evaluation work will be slightly more utility-specific: the ComEd impact evaluations will focus on a sample of the projects with electric savings (33 projects in EPY7), while the Nicor Gas impact evaluation will focus on a sample of projects claiming gas savings (10 projects in GPY4).<sup>3</sup> Table 1 shows the numbers of ComEd and Nicor Gas projects for which each utility claims savings among the 33 projects completed in EPY7/GPY4. ComEd-only projects are those which do not fall within the Nicor Gas service territory.

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<sup>1</sup> The evaluation team expects to take a similar approaches to PY8 and future evaluations; however, changes to the gas portion of the program discussed above may necessitate some alterations. As such, we will develop separate evaluation plans for future program years.

<sup>2</sup> The evaluation team will continue to use this interview approach in EPY7/GPY4 and EPY8/GPY5 as new projects enter the Reservation Stage (scheduled projects). Interviews with any new projects will use evaluation budget from the program year in which the project entered the reservation stage.

<sup>3</sup> Source: Seventhwave, "NC evaluation data request 03\_04\_15.xlsx"

**Table 1: Completed ComEd EPY7 Projects and Nicor Gas GPY4 Projects**

Project Description	Savings Claims by ComEd EPY7	Savings Claims by Nicor Gas GPY4	Number of Projects
ComEd Only	Yes	No	15
Joint without Therm Savings	Yes	No	7
Joint with Therm Savings	Yes	Yes	11
All projects with Therm Savings	Yes	No	20*
<b>Total</b>	-	-	<b>33</b>

Source: Seventhwave, "NC evaluation data request 03\_04\_15.xlsx"

\*These totals include all projects reporting positive therm savings before interactive effects from electric measures, regardless of whether a gas incentive was paid.

## Evaluation Research Topics

The objectives of the EPY7/GPY4 evaluation are as follows:

1. Provide adjusted gross impacts for all completed projects using a researched realization rate
2. Provide verified net savings for all projects completed in EPY7/GPY4
3. Update the verification, due diligence, and tracking system review from EPY7/GPY4 if needed
4. Continue the new approach for NTG derivation. This will include:
  - a. Review of program documentation for projects that have recently reached the reservation stage, including:
    - i. email correspondence and technical assistance summaries and
    - ii. pre- and post-design/engineering plans and building models to help guide in-depth interview questioning. Coordinate with the implementation team to discuss their understanding of the project's participation prior to the evaluation team interviewing the project contacts. This coordination will help the evaluation team to better understand the program's role in the project.
  - b. Collection of NTGR data, including data on spillover, from EPY7/GPY4 participants across two interviews:
    - i. A primary interview conducted within 30 days of or as soon as possible after the reservation date to minimize possible measurement issues associated with memory
    - ii. A secondary interview conducted after verification is complete to understand any design changes and program effects through the construction phase.

The EPY7/GPY4 evaluation will seek to answer the following key researchable questions:

## Impact Evaluation

1. What are the research findings gross energy and demand impacts?
2. What are the verified net impacts from the program using SAG-approved NTGRs?
3. Did the program meet its energy and demand savings goals? If not, why not?
4. What are the free ridership and spillover values to be used prospectively in future program years?

## Process Evaluation

1. What design or implementation changes, including changes to the program’s marketing and outreach plan, occurred in EPY7/GPY4?
2. What challenges did the program face over the course of the program year and how did the program respond to them?

## Evaluation Approach

### Multi-Year Overview

As previously stated, this plan covers the program evaluation for EPY7/GPY4; however, the evaluation team expects to take a similar approach in future program years. Given some of the changes to the program that will occur in PY8 (described in the first section of this plan), adjustments to our approach may be required. As such, we will release a separate evaluation plan to cover the evaluation of PY8.

### Data Collection, Methods, and Sample Sizes

Table 2 below summarizes the surveys, interviews, and other primary data sources that will be used to answer these research questions in EPY7/GPY4. We anticipate employing similar sources and data collection activities in the evaluation of future program years, though quantities of projects reviewed will differ.

**Table 2. Surveys, Interviews, and Other Primary Data Sources**

Method	Subject	Quantity	Date	Gross Impacts	Net Impacts	Process
In-Depth Telephone Interviews	Program Managers, Implementation Contractor	4	May 2015			X
Engineering Desk Review	EPY7/GPY4 Project Files	~20a	July - August 2015	X		
Correspondence and Technical Assistance Review (EPY7/GPY4)	Projects currently in Reservation Stage	Up to 51	June – September 2015		X	
Post-Reservation and Post-Verification Interviews	Projects currently in Reservation Stage	Up to 51	June – September 2015		X	X

a = The total number of projects receiving engineering desk reviews for EPY7/GPY4 may change based on the final list of projects and their savings.

Table 3 summarizes other secondary data sources that will be referenced to answer the research questions.

**Table 3. Core Data Collection Activities and Sample**

Reference Source	Author	Gross Impacts	Net Impacts	Process
Program Tracking Database	Program Administrator	X	X	X
Email Correspondence	Program Administrator		X	
Building Plans	Program Administrator	X	X	
Program Marketing and Outreach Materials	Program Administrator			X
Illinois Technical Reference Manual (TRM)	Vermont Energy Investment Corporation	X		
International Energy Conservation Code (IECC) 2009	International Code Council	X		
International Energy Conservation Code (IECC) 2012	International Code Council	X		
ASHRAE Building Standards and Guidelines	ASHRAE	X		

The sections below describe the data that will be collected; the method of collection; and the method for analyzing the data to answer the impact, process, and market effects questions.

### Gross Impact Evaluation

The evaluation team will conduct gross savings research on a sample of approximately 20 projects to determine EPY7/GPY4 Research Findings savings and calculate realization rates. This research will include an engineering desk review of each project in our sample. The review will use the data and documentation collected by the implementer with calls to the project contacts as needed.

The evaluation team will also develop a summary sheet for each project reviewed that outlines the evaluation activities completed, the resulting changes to the model (as applicable), and the effect on the electric and therm savings claimed.

The baseline for all projects (when not using deemed values) will typically be based on the appropriate Illinois Energy Conservation Code for Commercial Buildings. Where the Illinois code is not applicable, such as for new construction within an industrial site not covered by the code, we will work with the implementation team to identify the most appropriate baseline.

For EPY7/GPY4 the evaluation team will use the project's application date to determine which version of the Illinois Energy Conservation Code, which references the International Energy Conservation Code (IECC), is the most appropriate to use as baseline. The IECC 2009 was updated with the IECC 2012.

Illinois had an effective date of January 1, 2013 for application of the IECC 2012.<sup>4</sup> We will assume that all projects that submitted applications after this date were subject to the IECC 2012 baseline.

The evaluation team will also calculate interactive savings associated with projects for each utility to be used within the cost effectiveness analysis by each utility. This analysis will attribute interactive savings and penalties from each fuel type to the utility associated with the measure creating the interactive effects. We include all interactive effects for projects the program database indicates are joint projects (i.e., the project receives natural gas service from Nicor Gas and electric service from ComEd, but may or may not have received a Nicor Gas incentive). We will also present researched savings without interactive effects for comparison to utility goals.

#### *Gross Impact Evaluation Sampling Approach*

The evaluation team plans to create two sample frames, one focused on ComEd projects and one focused on Nicor Gas projects. The ComEd sample frame will be composed only of projects with electric savings. These projects may or may not have gas savings and may or may not be in the Nicor Gas service territory. The Nicor Gas sample frame will consist of all Nicor Gas projects with positive therm savings before interactive effects from electric measures, whether or not the project received a Nicor Gas incentive.

By creating two frames, each project with therm savings will have an opportunity to be chosen within our sample. Within each of the sample frames, we plan to use a stratified random sample design. For ComEd sample, this design will be based on kWh. For the Nicor Gas sample frame, the team will stratify based on each project's total therm savings before interactive effects from electric measures. Each sample will be designed to reach 90% confidence and 10% precision two tailed for MWh and therms, respectively. The overall sample will include 20 projects, approximately 8 of which will be joint Nicor Gas projects.<sup>5</sup>

**Table 4: Estimated Number of Projects in Sample**

Utility	Estimate of Projects in Sample
ComEd	12
Nicor Gas	8
<b>Total</b>	<b>20</b>

### **Verified Net Impact Evaluation**

The evaluation team will apply a deemed NTGR to calculate net savings. The deemed NTGR is based on research conducted in EPY4/GPY1 and recommended by the SAG. These values are shown in the following table.

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<sup>4</sup> Senate Bill 3724, signed by the Governor on August 17, 2012, amends the effective date of the 2012 IECC to January 1, 2013. Administrative Rules to adopt the 2012 IECC with amendments were approved by the Joint Committee on Administrative Rules on December 11, 2012.

<sup>5</sup> The number of projects in the sample may change based on the final list of EPY7/GPY4 projects and their savings.

**Table 5. Verified Net Savings Parameters**

Utility	PY7 Deemed NTG Value
ComEd (MW and MWh)	0.80
Nicor Gas (therms)	0.92

## Research NTG Impact Evaluation

Discussion in April 2013 between program and implementation staff and the evaluation team inspired a new “real-time” approach for deriving the NTGRs, which captures data as projects progress through the stages of participation. This approach was initiated in 2013. The evaluation team will continue to use this approach in EPY7/GPY4. This methodology will include the following components:

- 1. Documentation Review.** The evaluation team will begin by reviewing the documentation on each sampled project provided by Seventhwave to identify potential points of influence. This component will include:
  - a. Reviewing email correspondence for indications of program influence;
  - b. Reviewing building plans from throughout the project’s participation to identify changes in efficiency throughout the construction process; and
  - c. Discussing the project with Seventhwave to confirm areas where Seventhwave believes the program was influential.
- 2. Post-Reservation Interview.** Once a sampled project reaches the reservation stage, Seventhwave will provide the evaluation team contact information for key decision makers and the team will conduct a post-reservation interview within 30 days or as soon as possible. We will also incorporate customized questions for each project linked to the points of influence identified in the documentation review. The team will use the in-depth interview guide used in the “real time” NTGR interviews piloted in 2013.
- 3. Post-Verification Interview.** Once the project is complete, we will conduct a post-verification interview. This interview will check for program influence not captured in the first interview. For example, in the first interview, the participant may not have realized the role the program’s incentives or technical assistance would play in maintaining energy efficient design elements throughout the project. During these interviews, the team will also collect process data.

To support the real time NTGR approach, the evaluation team will attempt to conduct post-reservation interviews with all 51 ComEd projects<sup>6</sup> currently in the Reservation Stage that have not already been interviewed for the same project during the prior evaluation period. These projects represent projects from multiple program years, as shown in Table 6.

In our EPY6/GPY3 evaluation, we attempted a census of projects accepted into the program and were able to complete interviews with 38 out of 65 projects (58%). For the EPY7/GPY4 evaluation and beyond, we will once again attempt a census of all 51 projects; however, assuming a similar response rate to EPY6/GPY3, expect to complete interviews with approximately 30 project representatives. Figure 1 shows our expected schedule for post-reservation and post-verification interviews for all 51 projects currently in

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<sup>6</sup> As shows in Table 6, there are currently 74 projects in the pipeline are in the reservation phase - we completed interviews with 14 of those for our EPY6/GPY3 evaluation and nine declined an interview.

the pipeline. This estimated schedule is based on roughly 10 interviews per month, understanding that this may fluctuate based on project representative availability. The post-verification interview schedule is based on adding four months to each project’s estimated completion date (as of 3/4/15), as completion dates for projects often vary from what was originally scheduled.

**Table 6: Number of ComEd Projects Begun in EPY7/GPY4 with Expected Program Year Completion Date**

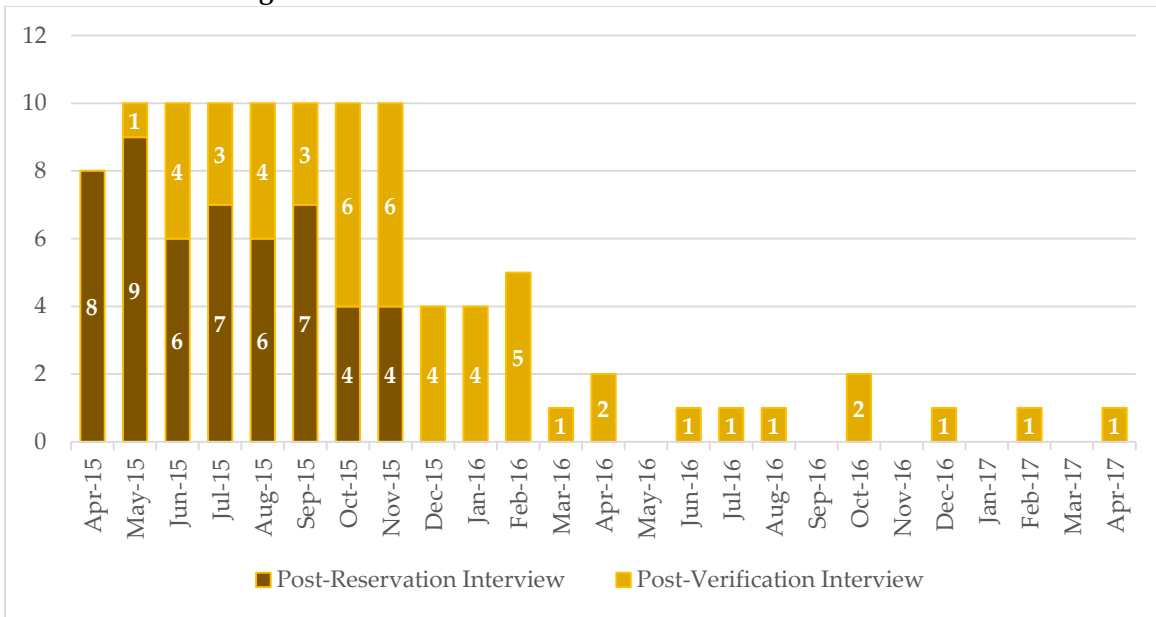
Expected Program Year of Project Completion	In Reservation Phase as of 3/4/15	Total
PY7	21	63
PY8	44	104
PY9	9	30
PY10	0	9
PY11	0	2
<b>Total</b>	<b>74</b>	<b>208</b>

In order to fully implement the “real time” NTGR approach, we will need to conduct interviews for all projects currently in the Reservation Stage, regardless of program year, to best capture the program’s early influence. As such, we will attempt to schedule interviews on a rolling basis, regardless of the program year for completion, as each project enters the Reservation Stage. Similarly, we will complete post-verification interviews with projects as they become complete in their respective program years.

Because we will attempt to interview a census of projects, no sampling of projects or differentiation between electric and gas savings is needed. A census is preferable to a sample at this time primarily because the current NTGR approach calls for the two interviews generally spaced apart by many months. The time between the initial and second interviews creates a challenge in estimating the number of projects with full interview sets that we will be able to complete in any given period of time. If, due to project delays or project contacts unavailable for second interview, we are unable to complete the second interview in the designated period of time, this would reduce our ability to estimate NTGR with confidence. Given that the population of completed projects in any given future period is unknown and that we are not sure how many second interviews we will be able to complete, we believe it is prudent to attempt initial interviews with each project as it reaches the Reservation Stage.

In addition, with 33 projects completed in the most recent program year, adding or removing only a small number of projects to the overall size of a sample can have large impacts on the confidence interval. If, after we have completed initial interviews and we then have a firm estimate for when and how many second interviews we will be able to complete, we may be able to determine that we only need to conduct second interviews with a sample of the projects to obtain the desired level of confidence in the results. Further, if in future program years the program expands and the number of completed projects is significantly higher, conducting a census of projects may not be feasible or necessary.

**Figure 1: Estimated Real-Time NTGR Interview Schedule**



**NOTE:** The current schedule only takes into account the 51 ComEd projects currently in the Reservation Stage. The evaluation team expects to add additional interviews as projects enter the Reservation Stage, and more continue to sign up for the program.

### Process Evaluation

Given program maturity and historical high participant satisfaction, the EPY7/GPY4 process evaluations will be limited to activities that will provide information on participant characteristics, program implementation changes—such as changes to the program’s marketing and outreach strategy, and program challenges. The follow outline the two major activities for our process evaluation.

- 1) **Program Manager Interviews:** The interviews with program management will provide both the ComEd and Nicor Gas evaluations with information on program implementation changes and challenges for each program year.
- 2) **Review of Program Marketing Materials:** The evaluation team will review any new marketing materials to assess how the gas and electric offerings are presented. The team will also review any commercial new construction market research conducted by ComEd, Nicor, or Seventhwave.

### Evaluation Schedule

Table 7 shows the combined schedule of activities for both ComEd and Nicor Gas evaluations. In the table, the evaluation team has included the projected number of days for each task from its planned start date, and the projected completion date for each task for the EPY7/GPY4 evaluation.



**Table 7. Schedule – Key Deadlines**

Activity/Deliverables	Responsible Party	Projected Days to Complete	Date Delivered
Draft Plan For ComEd and Nicor Gas Review	Evaluation	21	May 11, 2015
Revised and Final Plans to ComEd and Nicor Gas	Evaluation	10	May 18, 2015
Program Staff and Implementation Contractor Interviews	Evaluation	15	May 15, 2015
Tracking Data to Navigant	ComEd	1	May 15, 2015
Sample Development	Evaluation	5	May 22, 2015
Project Files to Navigant	ComEd	30	June 19, 2015
Comprehensive Project Impact Engineering Desk Reviews	Evaluation	35	August 7, 2015
Internal Preliminary Gross Impact Findings Discussion	Evaluation	10	August 21, 2015
Advance Impact Findings to ComEd and Nicor Gas	Evaluation	5	September 11, 2015
Post-Reservation and Post-Verification Decision-Maker Interviews	Evaluation	On-going	Through September 2015 as Projects Reach Reservation and Verification Stages
Draft Report to ComEd and Nicor	Evaluation	15	November 15, 2015