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Date: September 21, 2021

Re: Net-to-Gross Research Results for the Combined Utility Non-Residential New Construction Program

Executive Summary

This memo presents the results of the net-to-gross (NTG) analysis conducted by the evaluation team during the calendar year 2021 (CY2021) evaluation of the Combined Utility Non-Residential New Construction Program (New Construction Program or Program) implemented for ComEd, Nicor Gas, Peoples Gas, and North Shore Gas Companies. This analysis included the estimation of participant free ridership (according to the algorithm revised by the Illinois SAG NTG Working Group) and development of select process-related research findings.

The evaluation team conducted in-depth phone interviews with participants in the New Construction Program. The sample frame included all 58 projects in the Program's Reservation Phase in early CY2021, some of which entered the Program as early as 2017.

The evaluation team produced free ridership estimates according to protocols recently developed by the Illinois Stakeholder Advisory Group (SAG) NTG Working Group. These results will inform Guidehouse's September 2021 recommendations to Illinois SAG regarding NTG values to be used for this Program in CY2022. The evaluation team did not conduct spillover research in CY2021.

With the spillover rate of zero (from EPY9/GPY6) and free ridership of 0.60 (electric energy and demand) and 0.61 (therms), the NTG ratio from the new research is 0.40 for electric energy and demand savings and 0.39 for natural gas savings.

Table 1 summarizes the New Construction Program free ridership research findings.

Table 1. Net-to-Gross Research Results for New Construction Program

Fuel	Free Ridership
kWh/kW	0.60
Therms	0.61

Source: Evaluation team analysis

Starting with the NTG value used for the CY2019 program year, the NTG values deemed by SAG have been the average of the previous four years of researched NTG values.[1] The evaluation team expects to recommend that same approach for the NTG value for the CY2022 programs. Table 2 provides the researched NTG ratios resulting from PY9 through CY2021 evaluations plus the values from the new research. The evaluation team estimated a level of free ridership generally consistent with but slightly higher than historical results. Table 3 provides the historical NTG values applied to calculate net savings in each program year.

Table 2. Net-to-Gross Research Values and Recommendations for CY2022 Programs

Evaluation Year	Electric	Gas
PY9 (GPY6)	0.54	0.48
CY2018	0.45	0.45
CY2019	0.51	0.39
CY2020	NA	NA
CY2021	0.40	0.39
Recommended Value for CY2022 (4-Year Average)	**0.48**	**0.43**

Source: Evaluation team analysis

Table 3. Historical Deemed Net-to-Gross Ratios

Program Year	Electric	Gas
PY9 (GPY6)	0.77	0.67
CY2018	0.60	0.77
CY2019	0.68	0.70
CY2020	0.59	0.58
CY2021	0.53	0.54

Source: Evaluation team analysis

Free Ridership and Spillover Research Representation

Free Ridership

Consistent with the CY2019 evaluation, the evaluation team employed a real time approach for researching free ridership. This methodology involves a review of project documentation and an

[1] Although the researched program-level NTG ratio for each program year is based on individual project-level NTG ratios weighted by savings, the 4-year value is not weighted by savings and instead is a simple average of the 4 years.

in-depth interview with key decision makers on the participating project teams. The interviews included questions about participants' awareness of incented energy efficiency measures and their motivations for incorporating these measures into the project. In addition, and in accordance with the evaluation plan, the evaluation team conducted a secondary documentation review (Enhanced Rigor review) for the largest projects in the sample to corroborate or support adjustments to project-level results.[2] The following sections detail the evaluation team's approach.

1. Project Documentation Review

Before conducting each interview, the evaluation team reviewed the following project-related documents when applicable:

a. **Measure Incentive Reservation:** The evaluation team began by reviewing the measure incentive reservation for each project. This document allowed the evaluation team to explore program attribution and, if needed, calculate NTG ratios for individual measures or end uses. The measure incentive reservation document contained:

   i. Project description

   ii. Estimated savings by energy efficiency measures (baseline compared to proposed equipment)

   iii. Estimated incentive by energy efficiency measures

b. **Project Narrative:** The evaluation team also reviewed the project narrative file for each project for which it was provided.[3] Developed by the implementation contactor, these narratives allowed the evaluation team to determine potential areas of program influence. This file included:

   i. Contact information for key project stakeholders.

   ii. Project history—the implementation contractor listed key dates for the project, including formal project milestones (e.g., date of application reception), informal milestones (e.g., documenting receipt of updated drawings), and communication between the participant and implementation contractor. For each entry, the implementation contractor listed the date and a summary of the event/milestone.

   iii. Project narrative—the implementation contractor summarized the project.

c. **Program Influence Report:** When a project narrative was not provided, the evaluation team reviewed a program influence report. Developed by the implementation contractor in 2020, the program influence report allowed the evaluation team to better understand

[2] The evaluation plan states the Enhanced Rigor review will cover the projects accounting for the top 20% of energy savings of the sample of completed interviews. In practice, the evaluation team included four projects in the Enhanced Rigor review, accounting for 39% of electric savings and 28% of gas savings.

[3] Over the last year the implementation contractor has begun replacing the project narrative descriptions with Program influence reports for all new projects.

how the Program sought to influence the energy efficiency design of participating projects. The file included:

i. Project information including energy baseline and square footage.

ii. Contact information for key project stakeholders.

iii. Project-level influence report—an annotated checklist of ways the Program attempted to influence the project overall.

iv. Measure-level influence report—a table detailing how the Program attempted to influence specific energy efficiency measures.

d. Enhanced Rigor Documentation: The evaluation team requested additional documentation for the largest projects in the sample frame. This documentation included all relevant project materials, communications, email documentation of engagement history, and other project files. Reviewing these materials before post-reservation interviews allowed the evaluation team to gain context about projects that would be part of the Enhanced Rigor sample. The following section, 3. Enhanced Rigor Project Documentation Review, describes how the evaluation team used this information when calculating NTG results.

2. Post-Reservation Interview

At the beginning of the evaluation period, the evaluation team reviewed program tracking data and requested the project documentation detailed above for all projects in the Program's Reservation Phase in early CY2021. Although some of these projects will close and be included in the Program's CY2021 annual impact evaluation, others are expected to be finalized in future program years.

Outreach and interviewing occurred during a 5-week period between April and May 2021. During this period, the evaluation team attempted to reach the primary contact (either a building owner or design team member) for each project. The evaluation team completed interviews for 32 projects and achieved a response rate of 55%. Since this analysis relies on a census, the concept of sampling error does not apply.

The evaluation team sought to speak with key decision makers for each project. In most cases, the primary project contact was the key decision maker. The evaluation team verified this information verbally before continuing the interview or requested contact information for a more appropriate project contact. During the interview, participants responded to attribution-related questions to support the NTG analysis. When appropriate, the evaluation team also incorporated follow-up questions for each project linked to the potential points of influence identified in the documentation review.

Of the 58 projects in the sample frame, the evaluation team completed interviews with 32 respondents, achieving a response rate of 55%. As Table 4 shows, the 32 respondents represent projects that account for 67% of the total ex ante kilowatt-hour savings and 74% of the total ex ante therm savings.

Table 4. Completed Post-Reservation Interviews

Measure	Population	Sample Frame	Target Completes	Completed Interviews	Percent of Population	Percent of Population kWh Savings*	Percent of Sample Therm Savings†
Overall Program	58	58 (census)	30	32	55%	67%	74%

*Total ex ante kWh savings for population: 23,041,994 kWh
†Total ex ante therm savings for population: 379,949 therm
Source: Evaluation team analysis

3. Enhanced Rigor Project Documentation Review

The evaluation team conducted an Enhanced Rigor project documentation review to corroborate or support project-level NTG findings. In accordance with the evaluation plan, the evaluation team also conducted a secondary documentation review for the largest projects in the sample to corroborate or support adjustments to project-level results. During this process, two members of the evaluation team independently reviewed all relevant project materials, communications, email documentation of engagement history, and other project files. Based on review of this documentation and the respondent's transcribed interview, each analyst developed a narrative to support a recommendation of 1) no change, 2) excluding Efficiency Score 1, or 3) excluding Efficiency Score 2. Appendix A describes the results of this process.

Of the 32 completed interviews, the evaluation team selected four projects for an Enhanced Rigor documentation review. As Table 5 shows, these four projects account for 38% of the total captured kilowatt-hour savings and 28% of the total captured therm savings.

Table 5. Completed Enhanced Rigor Reviews

Measure	Completed Interviews	Projects with Enhanced Rigor Review	Percent of Completed Interviews	Percent of Completed Interviews kWh Savings*	Percent of Completed Interviews Therm Savings†
Overall Program	32	4	13%	38%	28%

*Total ex ante kWh savings for completed interviews: 15,543,417 kWh
†Total ex ante therm savings for completed interviews: 282,154 therm
Source: Evaluation team analysis

Spillover

As planned, the CY2021 NTG evaluation did not include an evaluation of program spillover. In electric program year (EPY) 9/ gas program year (GPY) 6, the evaluation team conducted an online survey of past program participants and training participants to quantify potential cases of spillover resulting from the New Construction Program. Based on the survey results and follow-up interviews, the evaluation team determined there was no related spillover.

Free Ridership Protocol

The evaluation team applied the relevant free ridership protocol from the algorithms recently developed by the Illinois SAG NTG Working Group. This protocol calculates free ridership as

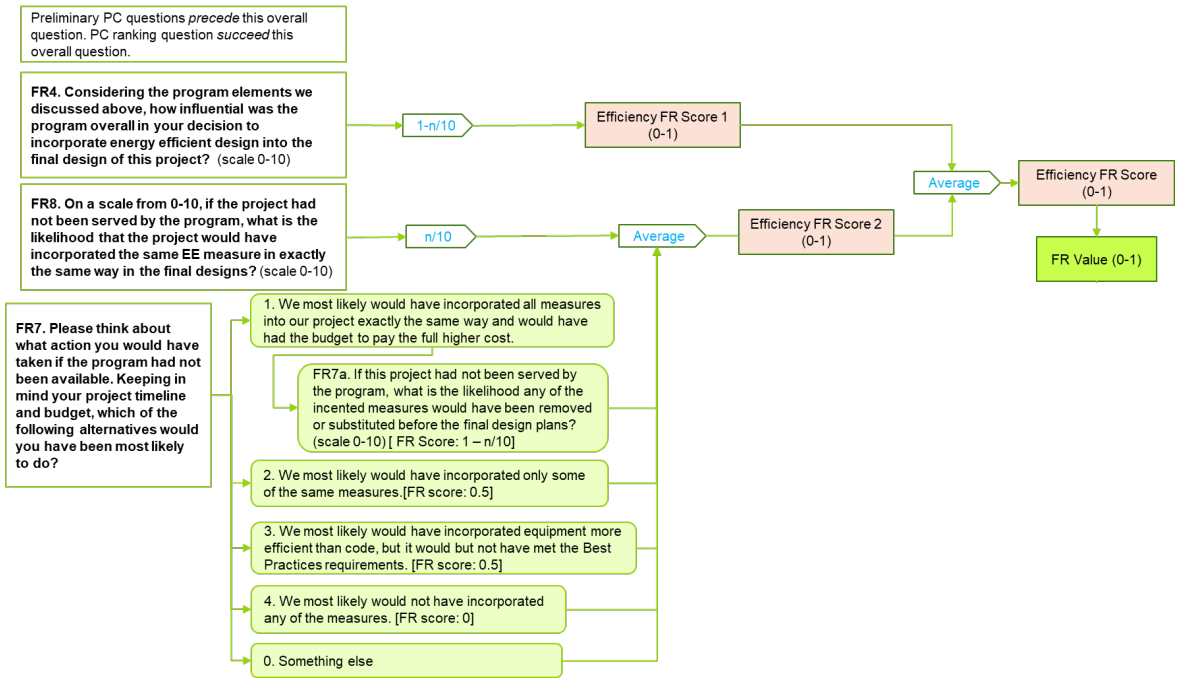
the average of two efficiency free ridership sub-scores (Efficiency Score 1, or EF1, and Efficiency Score 2, or EF2), which are calculated based on three items: overall program influence, a likelihood-based counterfactual score, and a scenario-based counterfactual question.

The following section and Appendix A detail each of these free ridership sub-scores, the corresponding interview questions used to calculate them, and the overall equation for determining the NTG ratio.

Participant Free Ridership Estimation

Figure 1 describes the Illinois SAG NTG Working Group algorithm that Guidehouse used to calculate the free ridership for the New Construction Program. Notably, the New Construction Program free ridership algorithm does not include a quantity and timing adjustment because the concept of project timing and deferred free ridership is not applicable to new construction projects. New construction programs intervene in the early phases of ongoing construction projects (i.e., after the decision to build has been made). As a result, participation in the New Construction Program would not be expected to accelerate the construction of the new building.[4]

Figure 1. New Construction Program Free Ridership



Source: Illinois SAG NTG Working Group

[4] Illinois TRM v9.0 Protocol 3.4.1

Free Ridership Consistency Check Analysis

Throughout each post-reservation interview, the evaluation team used follow-up questions to verify the consistency of prior responses. In addition, if a respondent provided responses to the overall program influence question (FR4) that were inconsistent with their no program score (FR8), they received a specific consistency check question.[5] Two out of the 32 respondents provided responses that remained inconsistent at the completion of the interview. For an additional two projects, open-ended responses indicated potential inconsistencies or confusion about the participation process, so they were also revised under this task. For these projects, the evaluation team examined the free ridership sub-scores and removed or revised the score that was inconsistent with the respondent's other feedback. See Appendix A for further details.

Final NTG Results and Recommendations

Because projects that participate in the New Construction Program are generally large, custom, and relatively few in number, the Program's estimated NTG ratios have varied over time. To account for this variability, the fact that projects typically span multiple years, and to increase the number of observations from which the value is calculated, the evaluation team recommends using an average of several years of NTG ratios to calculate net savings for CY2022 programs.

Table 6 summarizes Guidehouse's draft recommendations for New Construction Program electric and gas measures to be used in CY2022 based on our newest NTG research. The table shows the researched NTG ratios from the past 4 program years with the CY2021 NTG results and the 4-year average by fuel type.[6] Table 7 provides the historical NTG values applied to calculate net savings in each program year.

Table 6. Free Ridership and Net-to-Gross Research Values and Recommendations for CY2022 Programs

Evaluation Year	Electric		Gas	
	FR	NTG	FR	NTG
PY9 (GPY6)	0.46	0.54	0.52	0.48
CY2018	0.55	0.45	0.55	0.45
CY2019	0.49	0.51	0.61	0.39
CY2020	NA	NA	NA	NA
CY2021	0.60	0.40	0.61	0.39
Recommended Value for CY2022 (4-Year Average)		**0.48**		**0.43**

FR = Free Ridership
NTG = 1 – FR
Source: Evaluation team analysis

[5] Respondents received a follow up question if their responses to FR8 and FR4 were both greater than seven or both less than three.

[6] While the researched program-level NTG ratio for each program year is based on individual project-level NTG ratios weighted by savings, the 4-year value is not weighted by savings and instead is a simple average of the four years.

Table 7. Historical Deemed Net-to-Gross Ratios

Program Year	Electric	Gas
PY9 (GPY6)	0.77	0.67
CY2018	0.60	0.77
CY2019	0.68	0.70
CY2020	0.59	0.58
CY2021	0.53	0.54

Source: https://www.ilsag.info/policy/net-to-gross-framework/ and evaluation team analysis

For applying to programs in CY2022, Guidehouse recommends the NTG rates of 0.48 (electric) and 0.43 (gas), based on the 4-year average of researched values.

Using the TRM v9, the electric and gas participant free ridership would have been 0.56 and 0.58 respectively.[7] Appendix A discusses NTG methodology and analysis results.

[7] Because the NRNC algorithm does not include a timing and quantity adjustment factor TRM Algorithm 1 and TRM Algorithm 2 are identical.

Appendix A. Detailed NTG Results

A.1 Free Ridership Component Scores

The CY2021 NTG evaluation employed the free ridership protocol recently developed by the Illinois SAG NTG Working Group in 2021. The revised algorithm includes two key changes relative to the TRM algorithm:

1. Replacing the program component score with overall program influence (FR8)

2. Adding a scenario-based counterfactual score

The revised algorithm calculates project-level free ridership scores as the average of Efficiency Score 1 and Efficiency Score 2. Efficiency Score 1 is calculated based on FR4, and Efficiency Score 2 is calculated based on FR7 and FR8.

The evaluation team also attempted to isolate free ridership by measure or end uses when deemed appropriate by the respondent. Consistent with prior evaluations, however, most respondents did not choose to differentiate numeric responses between measures. In CY2021, six out of 32 respondents provided measure-level responses. In these cases, the evaluation team calculated free ridership for each measure and used a savings weighted average to determine project-level results.

Figure 1 details the revised algorithm. Table 8 summarizes Efficiency Score 1 and Efficiency Score 2.

Table 8. Net-to-Gross Analysis Plan (Free Ridership Question Score Map)

FR Sub Score	Questions	Algorithm Notes
Efficiency Score 1	Overall program influence (FR4)	This question asks respondents to rank the overall influence of the program on a scale from zero to 10, where zero corresponds to “no influence at all” and 10 corresponds to “extremely influential.”
Efficiency Score 2	No program score (FR8)	This question asks respondents to rank the likelihood the project would have included the same level of energy efficiency had the program not been available, on a scale from zero to 10, where zero corresponds to “not at all likely” and 10 corresponds to “extremely likely.”
	Scenario-based counterfactual (FR7)	This question asks respondents to select which alternative behavior they would have been most likely to do had the program not been available.

Source: Illinois SAG NTG Working Group

The evaluation team reviewed and, if needed, adjusted project-level results for 1) Enhanced Rigor projects and 2) projects with inconsistent sub-scores or otherwise flagged for inconsistency review due to open-ended responses.[8] Of the four projects reviewed under the

[8] A project has inconsistent sub-scores if responses to FR4 and FR8 were both greater than seven or both less than three.

Enhanced Rigor protocols, three found consistency between the calculated FR scores and program documentation. The final project review found EF1 was more consistent with project documentation and EF2 was removed from the calculations. Four other projects were also identified as inconsistent. For two of these projects, review of additional open-ended responses indicated EF2 was a more accurate representation of project free ridership than EF1, and EF1 was removed. One project was excluded from the free ridership calculation because the respondent lacked clarity on the program incentivized measures. In the final inconsistency review, the respondent indicated their project was the second wave of a two-wave project, and the first wave of their project was highly influential in the decision-making around energy efficiency in the current project. The evaluation team found in historical tracking data that the first wave had participated in the NRNC program in 2013 and therefore assigned the SAG Consensus 2013 FR scores to this project. Table 9 summarizes the results of both review processes.

Table 9. Free Ridership Enhanced Rigor and Consistency Check Summary

Project Review Category	Number of Projects
Enhanced Rigor	**4**
No Change	3
Removed EF1	0
Removed EF2	1
Revised Both	0
Excluded Both	0
Inconsistent	**4**
No Change	0
Removed EF1	2
Removed EF2	0
Revised Both	1
Excluded Both	1

Source: Evaluation team analysis

To obtain the program-level free ridership, the evaluation team calculated separate savings weighted averages for Efficiency Score 1 and Efficiency Score 2 based on ex ante gross kilowatt-hour savings and gross therm savings. The overall free ridership score reflects the average of these two estimates. Table 10 shows these results for CY2021.[9]

[9] All 32 of the interviewed projects had electric savings while 26 also had gas savings.

Table 10. Free Ridership Component Scores

Savings Type	Efficiency Score 1	Efficiency Score 2	Free Ridership
kWh/kW	0.55	0.64	0.60
Therms	0.54	0.69	0.61

Source: Evaluation team analysis

With the spillover rate of zero (from EPY9/GPY6) and free ridership of 0.60 (electric energy and demand) and 0.61 (therms), the NTG ratio for CY2021 is 0.40 for electric energy and demand savings and 0.39 for natural gas savings.

A.2 Additional Findings

Overall, the CY2021 NTG results appear consistent with the qualitative feedback offered by respondents during post-reservation interviews. The evaluation team found building codes, environmental certifications (e.g., LEED, Green Globes), market preferences, and site-specific needs were key drivers of energy efficient design. Respondents offered positive remarks when speaking about their participation in the New Construction Program, but rarely identified the Program as the sole motivating factor in their decision to include program-incentivized measures in their project. Several respondents praised the program for its role in helping keep their project on track to meet incremental goals. One respondent noted:

> *"There are stringent code requirements in Illinois, so our design team was implementing and integrating [energy efficiency] from the beginning. [T]hanks to ComEd and this program, there was … a little extra attention drawn to some things, just to be sure to take maximum advantage of energy-saving materials and construction procedures to enhance the efficiency of the building."*

Participant feedback indicates that local policies and market preferences have driven aggressive energy efficiency strategies in the market that exceed the current energy codes. When asked to rate the influence of various non-program factors on their decision to incorporate energy efficiency into their project, respondents scored standard practice as 7.3 out of 10 on average—the highest average of any program or non-program factor. The evaluation team found similar attitudes among owners and design team members, including one design team member who said:

> *"I think the industry has evolved to the point where regardless of whether the owner cares about getting that plaque on the wall and proving it, that we specify [energy efficiency measures] just because it's best practice. It's the right thing to do and the owner basically expects that of [the design team]."*

Going forward, the evaluation team expects that stringent code requirements and market preferences for energy efficiency may continue to increase free ridership in the New

Construction Program. The evaluation team suggests program managers explore adopting a common practice baseline that would reflect the typical actions of participants in absence of the program.[10] Given the long engagement history of the New Construction Program in the Illinois new construction market, the evaluation team also suggests program managers consider studying the long-term market effects of the program to determine, what, if any, influence the New Construction Program had on developing and supporting these standard practices.

The Program may wish to reconsider the energy baseline used for projects that pursue advanced building certification. Participant feedback indicates that certification goals can have an outsized influence on project design decisions, limiting the influence of program incentives designed to encourage the same practices.

A.2.1 Code Compliance and the Chicago Sustainable Development Policy

During post-reservation interviews, the evaluation team found 14 out of 32 projects mentioned building code or other local standards as having direct influence on the decision to pursue high efficiency measures in their projects. One such standard, the Chicago Sustainable Development Policy (CSDP), was highlighted by some of the largest projects as being highly influential.

The CSDP requires development projects that are receiving City assistance to implement sustainable elements. This includes all planned developments, tax increment financing projects receiving more than $1 million in funding, and affordable, multifamily housing projects receiving various types of financial assistance and tax credits. In practice, most large private development projects are subject to this policy.[11] Recently updated in 2016, the policy relies on a points-based system with different thresholds for new construction (100 points) and major renovation projects (25 or 50 points). Projects governed by CSDP can earn points by implementing individual building strategies or achieving building certification (e.g., LEED, Green Globes, PassiveHouse, etc.).[12]

Projects subject to CSDP requirements that receive incentives through the New Construction Program may exhibit higher levels of free ridership as their decision to pursue incentivized measures may have been effectively required, even if not prescriptively required.

A.2.2 Additional Participant Feedback

During post-reservation interviews, the evaluation team solicited additional feedback from participants about their experiences with the program and potential improvements. Many shared positive experiences working with program staff and showed appreciation for their collaboration among project teams. None of the 32 respondents recommended specific improvements to the program.

Appendix E provides additional verbatim responses.

[10] Common practice baselines, though not currently in use in Illinois, appear in the Illinois TRM v9.0 (Vol. 4, Sec. 6.4)

[11] Source: https://database.aceee.org/city/energy-code-stringency

[12] Source: https://www.chicago.gov/city/en/depts/dcd/supp_info/sustainable_development/chicago-sustainable-development-policy-update.html

Appendix B. ComEd Non-Residential New Construction Program NTG History

	Business New Construction Service
PY1	NTG was not evaluated for PY1 because program began in PY2.
PY2	**NTG:** 0.59 **Free Ridership:** 41% **Participant Spillover:** 0% **Method:** Customer self-report. 14 projects were assessed from a population of 16. Enhanced method. NTG scores were adjusted for standard design national retail stores.
PY3	**NTG:** 0.65 (0.69 for Systems Track and 0.54 for Comprehensive Track) **Free Ridership:** 35% **Participant Spillover:** 0% (qualitative evidence observed, not quantified) **Method:** Customer self-report. 13 interviews with individuals representing 15 projects out of population of 37 projects. Enhanced method. NTG scores were adjusted for standard design national retail stores.
PY4	**Compressive Track – Retroactive application of NTG of 0.54** **Systems Track used PY2 value of 0.59** **NTG:** 0.57 (based on weighted average of 0.59 for Systems Track and 0.54 for Comprehensive Track) **EPY4 Research Comprehensive Track:** 0.54 **EPY4 Research Systems Track:** 0.59 **Free Ridership:** 43% **Spillover:** 0% **Method:** EPY3 deemed value for Systems Track projects. Customer self-report for Comprehensive Track projects. Interviews with individuals representing 5 of 6 Comprehensive Track projects. Enhanced method. NTG scores were adjusted for standard design national retail stores and LEED projects.
PY5	Illinois SAG Consensus: • 0.65
PY6	Illinois SAG Consensus: • 0.65

	Business New Construction Service
PY7	**Full Program NTG:** 0.59 **Comprehensive NTG:** 0.59 **Systems Projects NTG:** 0.64 **Free Ridership:** 0.43 **Spillover (all types):** 0.05 **Source.** The NTG from estimate is from the EM&V EPY4 participant survey. Spillover is an EM&V estimate based on our literature review. In 50 participant interviews from EPY2-4 we found two spillover projects. Some of those interviews were early in the program's life when spillover is less likely. We also looked at existing literature on past studies and a wide range of spillover values. For example, in September 2012, National Grid Rhode Island published *2011 Commercial and Industrial Programs Free Ridership and Spillover Study*. For commercial new construction, they found 78% participant spillover and 0% nonparticipant spillover. Southern California Gas recently did a study to estimate spillover for its 2013 and 2014 Savings By Design program by looking at past studies. They only found a couple of older California studies relevant to commercial new construction. The 2003 BEA reported 11% participant spillover and 1% nonparticipant spillover. A 2002 study by the same evaluator showed 13% participant spillover and 5% nonparticipant spillover. Finally, they also looked at the NYSERDA New Construction Program Impact Evaluation Report from 2007-2008, which found participant spillover of 20% and nonparticipant spillover of 61%. This study has been questioned and we understand that NYSERDA is reevaluating its validity. Given the ComEd program design and implementation approach, it is reasonable to expect that a meaningful amount of spillover is being created and should be credited to the program. Given the range of spillover amounts we found in our literature review, we believe a spillover amount of 5% is probably a realistic and probably conservative estimate. That spillover is probably occurring through the action of architects, engineers, and builders who have had exposure to the program and, to a lesser degree, building owners who had a building go through the program. Given that mix, we have not tried to differentiate between participant and nonparticipant spillover.
PY8	**Recommendation (based upon PY6 research):** **Full Program NTG:** 0.80 – Preliminary, updated number to be provided later **Free Ridership:** 0.20 **Spillover:** 0.00 The researched NTGRs are being developed using a real time approach where the evaluation team conducts interviews with program participants both after each project passes the reservation phase, and again after it passes the verification phase.

	Business New Construction Service
PY9	**Full Program NTG:** 0.77 **Free Ridership:** 0.23 **Spillover:** 0.00 **NTG Research Source:** Free Ridership: Participant and service provider self-report through real time EMV. Spillover: NTG real time research methods in EPY6 combine participant and service provider survey results
CY2018	**Full Program NTG:** 0.60 **Free Ridership:** 0.40 **Spillover:** 0.00 **NTG Research Source:** Free Ridership: PY8 Participant and service provider self-report through real time EMV. Spillover: NTG real time research methods in EPY6 combine participant and service provider survey results.
CY2019	**Full Program NTG:** 0.68 **Free Ridership:** NA **Spillover:** NA **NTG Research Source:**

Year of Research	Electric
PY6	0.80
PY7	0.77
PY8	0.60
PY9	0.54
4-Year Average	**0.68**

Average of four most recent years of NTG research, as per Illinois SAG consensus

Business New Construction Service

CY2020

Full Program NTG: 0.59
Free Ridership: NA
Spillover: NA
NTG Research Source:

Year of Research	Electric
PY7	0.77
PY8	0.60
PY9	0.54
CY2018	0.45
4-Year Average	**0.59**

Average of four most recent years of NTG research including CY 2018 participating customer survey, as per Illinois SAG consensus

CY2021

Full Program NTG: 0.53
Free Ridership: 0.49
Spillover: NA
NTG Research Source:

Year of Research	Electric Researched Value/SAG Value
PY8	0.60/0.80
PY9	0.54/0.77
CY2018	0.45/0.60
CY2019	0.51/0.68
CY2020	NA/0.59
4-Year Average	**NA/0.53**

Average of four most recent years of NTG research, as per Illinois SAG consensus

Source: https://ilsag.s3.amazonaws.com/ComEd-NTG-History-and-CY2021-Recs-2020-09-30-Final.pdf

Appendix C. Peoples Gas (PGL) and North Shore Gas Non-Residential New Construction Program NTG History

	Business and Public Sector Joint Non-Residential New Construction Program
GPY4	**NTG:** 0.52 **Method and Source:** PGL and NSG have joined the Business New Construction (BNC) Program offered by Nicor Gas and ComEd. The BNC Program NTG value was the recommended value for Nicor Gas for GPY4.
GPY5	**NTG:** 0.92; **Free ridership** 0.08, **Spillover** 0.00 **Method and Source:** Value drawn from gas-weighted free ridership and spillover results from participant interviews conducted for the Nicor Gas and ComEd GPY3/EPY6 BNC Program.
GPY6	**NTG:** 0.67 **Method and Source:** FR, PSO, and NPSO research conducted for Nicor Gas and ComEd for GPY4/EPY7 resulted in a NTG of 0.57 for gas. Illinois SAG consensus for GPY6 is a 3-year average of 0.52, 0.92, and 0.57. Also applies to small business new construction.
2018 (GPY7)	**NTG:** 0.77 **Method:** Research conducted for ComEd and gas utility program partners for GPY5/EPY8 resulted in a NTG ratio of 0.83 for natural gas measures. Illinois SAG consensus for GPY6 and GPY7 was to use a 3-year average of the most recent NTG research values. For GPY7, the three most recent research values are: 0.92, 0.57, and 0.83, producing an average of 0.77. The NTG value also applies to small business new construction. The research applied TRM v5.0 NTG algorithms.
2019	**NTG:** 0.70 **Method:** Evaluation research conducted during GPY6/EPY9 for gas utility and ComEd projects resulted in a NTG of 0.48 for gas, applying TRM v6.0 methodologies. Memo: Net-to-Gross Research Results from the EPY9/GPY6 Non-Residential New Construction Program, Navigant (now Guidehouse), 8/24/18, revised 9/21/18. FR based on 24 interviews, PSO based on 120 online survey responses. Illinois SAG consensus NTG for GPY6 and 2018 (GPY7) was to use a 3-year average of the most recent research results (which were 0.92, 0.57, and 0.83 for 2018 (GPY7). For 2019, the Illinois SAG consensus is a 4-year average of NTG values (0.70), based on: 0.92, 0.57, 0.83, and 0.48.
2020	**NTG:** 0.58; **Free Ridership:** 0.42 **Method:** NTG average of previous 4 program years GPY4 (0.57), GPY5 (0.83), GPY6 (0.48), and CY2018 (0.45); 2018 FR estimate of 55% from Navigant (now Guidehouse) CY2018 research, based on 23 completed interviews.
2021	**NTG:** 0.54, **2019 Participant Researched Free Ridership:** 0.61 **Method:** NTG is the average of previous 4 program years GPY5 (0.83), GPY6 (0.48), CY2018 (0.45), and CY2019 (0.39); 2019 FR estimate from Opinion Dynamics CY2019 research, based on 28 completed interviews.

Appendix D. Nicor Gas Non-Residential New Construction Program NTG History

	Business and Public Sector Joint Non-Residential New Construction Program
GYP1	**NTG:** 0.33 **Free ridership:** 67% **Spillover:** 0% **Method:** Customer self-report for all projects. Interviews with individuals representing four of seven projects with gas incentives. NTG scores were adjusted for standard design national retail stores and LEED projects.
GPY2	**NTG:** 0.52 **Free ridership:** NA **Spillover:** NA **Method:** Illinois SAG deemed NTG ratio based on electric program evaluation results from EPY4.
GPY3	**NTG:** 0.52 **Free ridership:** NA **Spillover:** NA **Method:** Illinois SAG deemed NTG ratio based on electric program evaluation results from EPY4.
GPY4	**NTG:** 0.52 **Free ridership:** NA **Spillover:** NA **Method:** NTG values for GPY4 were deemed using values from GPY3 and reported in Table 14 of the Nicor Gas filed Energy Efficiency Plan for GPY4-GPY6.
GPY5	**NTG:** 0.52 **Free ridership:** NA **Spillover:** N/ **Method:** NTG values for GPY4 were deemed using values from GPY3 and reported in Table 14 of the Nicor Gas filed Energy Efficiency Plan for GPY4-GPY6.
GPY6	**NTG:** 0.67 **Method:** FR, PSO, and NPSO research conducted for Nicor Gas and ComEd for GPY4/EPY7 resulted in a NTG of 0.57 for gas. Illinois SAG consensus for GPY6 is a 3-year average of 0.52, 0.92, and 0.57. Also applies to small business new construction.
2018 (GPY7)	**NTG:** 0.77 **Method:** Research conducted for ComEd and gas utility program partners for GPY5/EPY8 resulted in a NTG ratio of 0.83 for natural gas measures. Illinois SAG consensus for GPY6 and GPY7 was to use a 3-year average of the most recent research values. For GPY7, the three most recent research values are: 0.92, 0.57, and 0.83, producing an average of 0.77. The NTG value also applies to small business new construction.

	Business and Public Sector Joint Non-Residential New Construction Program
CY2019	**NTG:** 0.70 **Method:** Evaluation research conducted during GPY6/EPY9 for gas utility and ComEd projects resulted in a NTG of 0.48 for gas, applying TRM v6.0 methodologies. Memo: Net-to-Gross Research Results from the EPY9/GPY6 Non-Residential New Construction Program, Navigant (now Guidehouse), 8/24/18, revised 9/21/18. FR based on 24 interviews, PSO based on 120 online survey responses. Illinois SAG consensus NTG for GPY6 and 2018 (GPY7) was to use a 3-year average of the most recent research results (which were 0.92, 0.57, and 0.83 for 2018 (GPY7). For 2019, the Illinois SAG consensus is a 4-year average of NTG values (0.70), based on: 0.92, 0.57, 0.83, and 0.48.
CY2020	**NTG:** 0.58; **Free Ridership:** 0.42 **Method:** NTG average of previous 4 program years GPY4 (0.57), GPY5 (0.83), GPY6 (0.48), and CY2018 (0.45); 2018 FR estimate of 55% from Navigant (now Guidehouse) CY2018 research, based on 23 completed interviews.
CY2021	**NTG:** 0.54; **2019 Participants Researched Free Ridership**: 0.61 **Method:** NTG average of previous 4 program years GPY5 (0.83), GPY6 (0.48), CY2018 (0.45), and CY2019 (0.39); 2019 FR estimate from Opinion Dynamics CY2019 research, based on 28 completed interviews. **FR:** Guidehouse CY2019 Research

Appendix E. Verbatim Responses

Topic	Quote
Energy codes	"We could have done more had it not been the building type that we have. This is an energy-intensive and code-driven building."
	"We knew there were energy goals that we were trying to achieve for building certification/LEED and for ourselves… A lot of it comes down to market feedback and supply chain availability in the Chicago market."
	"A lot of [program requirements] mesh with the current code and the energy efficiency requirements of the building codes and design codes. And if we can tweak them a little bit to also work with the ComEd requirements to get the incentives then that's something [we] usually are interested in."
Standard practices	"Lighting technology has evolved to the point where it's a given that most owners just want LEDs and it's not cost-prohibitive anymore. They understand the energy savings that they get from that. It's a no-brainer to specify certain things like that, regardless of what the overall energy goals are in the process."
	"[The program] really just reinforced the smart things that we would want to see done anyway… I think a lot of [energy efficiency measures are] are becoming pretty standard fare at this point."
Program technical assistance	"I would say probably the best thing we got out of the program, in terms of energy performance, was just having a second energy model done and having that accountability and another version to compare our overall building energy model to."
	"[The program] kept it on track, kept us within the parameters of meeting [our goals]."
	"The technical support was fantastic, generous and patient with us."
	"I think the project managers did a great job. They were available and responsive and followed up accordingly. And they were constantly checking in."
Incentives	"The project team was on the fence with [pursuing high efficiency measures] but knowing that there was a potential incentive there helped make that decision."
	"We always knew that the program was out there and there would be some benefits to circle back around on the throughout the project or by the end of the project. But I would say most of the decisions were made the incentive was not the driver for the decision. "