

# Home Energy Savings Program GPY2/EPY5 Evaluation Report

Final

Energy Efficiency Plan:  
Nicor Gas Plan Year 2  
Commonwealth Edison Company Plan Year 5  
(6/1/2012-5/31/2013)

Presented to  
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## E. Executive Summary

This report presents a summary of the findings and results from the Impact and Process Evaluation of the GPY2/EPY5 Home Energy Savings (HES) Program<sup>1</sup>. The Home Energy Savings Program is a joint program of Nicor Gas and Commonwealth Edison (ComEd), with Nicor Gas leading the program implementation. The Home Energy Savings program (HES) provides single-family homeowners who are customers of Nicor Gas or ComEd in the Nicor Gas territory a home weatherization service package. The weatherization package includes a comprehensive home energy assessment that includes combustion safety testing, direct installation of selected energy efficiency and water-saving measures, and incentives for installing a recommended package of weatherization measures. In GPY2/EPY5, the utilities partnered with Energy Impact Illinois (EI2)<sup>2</sup>, which added outreach efforts and funded an increase in incentives from GPY1/EPY4 levels. The program also piloted a reduction in the home assessment fee from \$99 to \$49 over a three month period. The reduction in the assessment fee led to an influx of participants that caused assessment delays due to implementation contractor, Conservation Service Group (CSG), staff limitations. CSG ultimately hired additional assessors in response to the participation demand.

### E.1. Program Savings

Table E-1 summarizes the program savings by utility and measure. The GPY2/EPY5 HES program realized net energy savings of 235,554 therms and 973 MWh.

**Table E-1. GPY2/EPY5 Program Results<sup>3</sup>**

Savings Category	Nicor Gas (Therms)	ComEd (MWh)
Ex-ante Gross Savings <sup>4</sup>	253,445	1,122
Verified Gross Realization Rate	1.08‡	0.999‡
Verified Gross Savings	273,900	1,121
Net to gross ratio (NTGR)	0.86†	0.87†
Verified Net Savings	235,554	973

Source: Navigant analysis of GPY2/EPY5 tracking data.

† A deemed value. ComEd overall NTG based on deemed measure-specific NTG values.

‡ Based on evaluation research findings.

<sup>1</sup> The GPY2/EPY5 program year began June 1, 2012 and ended May 31, 2013.

<sup>2</sup> Energy Impact Illinois is a non-profit alliance effort to promote energy-efficiency products and services to residential and business owners - led by the Chicago Metropolitan Agency of Planning in partnership with the City of Chicago, City of Rockford, gas and electric utilities, Illinois Home Performance with Energy Star, and other stakeholders. Its web site is [www.energyimpactillinois.org](http://www.energyimpactillinois.org).

<sup>3</sup> The results include 95 GPY1/EPY4 audit participants that received weatherization work in GPY2/EPY5 and thus contributed to GPY2/EPY5 weatherization savings. Navigant notes when these GPY1/EPY4 audit participants are excluded from certain GPY2/EPY5 process analyses.

<sup>4</sup> Based on tracking data extract from CSG, along with TRM savings update extract for gas measures

Table E-2 and Table E-3 present the ex-ante and verified gross and net electric and gas savings for the GPY2/EPY5 HES program, by measure. Direct install measures for the HES program include CFLs, low-flow showerheads, low-flow kitchen and bathroom faucet aerators, hot water heater temperature setback, pipe insulation, programmable thermostats, and programmable thermostat education. Weatherization measures include attic, wall, duct, and floor insulation, along with air sealing measures.

**Table E-2. EPY5 Electric Program Results, by Measure**

Research Category	Measure	Ex-ante Gross Savings (MWh)	Verified Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Direct Install Measures	9 Watt CFL	74	1.00‡	74	0.89†	66
	14 Watt CFL	269	0.998‡	268	0.89†	239
	19 Watt CFL	132	0.995‡	131	0.89†	117
	23 Watt CFL	122	1.00‡	122	0.89†	108
	9 Watt Globe CFL	211	1.00‡	211	0.89†	187
	Shower Head	19	1.01‡	19	0.94†	18
	Kitchen Aerator	0.4	1.18‡	0.4	0.94†	0.4
	Bathroom Aerator	2.2	1.13‡	2.5	0.94†	2.3
	Hot Water Temperature Setback	0.4	0.23‡	0.1	0.94†	0.1
	Pipe Insulation	3.9	1.21‡	4.7	0.94†	4.4
	Programmable Thermostat*	-	-	-	-	-
	Programmable Thermostat Education*	-	-	-	-	-
Subtotal		834	0.998	833	0.89	742
Weatherization Measures	Attic Insulation	119	1.00	119	0.80†	95
	Wall Insulation	1.7	1.00	1.7	0.80†	1.4
	Floor Insulation (Other)	3.1	1.00	3.1	0.80†	2.5
	Duct Insulation & Sealing	1.6	1.00	1.6	0.80†	1.3
	Air Sealing	163	1.00	163	0.80†	130
Subtotal		288	1.00	288	0.80	230
Total		1,122	0.999	1,121	0.87	973

Source: Navigant analysis of GPY2/EPY5 tracking data.

† A deemed value.

‡ Based on evaluation research findings.

\*Programmable thermostats were not included as an electric measure by ComEd in EPY5.



**Table E-3. GPY2 Gas Program Results, by Measure**

	Measure	Ex-ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Direct Install Measures	9 Watt CFL	0	-	0	0.86†	0
	14 Watt CFL	0	-	0	0.86†	0
	19 Watt CFL	0	-	0	0.86†	0
	23 Watt CFL	0	-	0	0.86†	0
	9 Watt Globe CFL	0	-	0	0.86†	0
	Shower Head	47,053	1.00‡	47,053	0.86†	40,466
	Kitchen Aerator	792	0.96‡	758	0.86†	652
	Bathroom Aerator	8,143	1.02‡	8,307	0.86†	7,144
	Hot Water Temperature Setback	2,566	1.00‡	2,573	0.86†	2,213
	Pipe Insulation	7,903	0.96‡	7,583	0.86†	6,521
	Programmable Thermostat	5,637	0.93‡	5,216	0.86†	4,486
	Programmable Thermostat Education	0	-	21,060	0.86†	18,112
	Subtotal		72,095	1.28	92,550	0.86†
Weatherization Measures	Attic Insulation	82,645	1.00	82,645	0.86†	71,075
	Wall Insulation	16,150	1.00	16,150	0.86†	13,889
	Floor Insulation (Other)	12,933	1.00	12,933	0.86†	11,122
	Duct Insulation & Sealing	76	1.00	76	0.86†	65
	Air Sealing	69,546	1.00	69,546	0.86†	59,809
Subtotal		181,350	1.00	181,350	0.86†	155,961
Total		253,445	1.08	273,900	0.86†	235,554

Source: Navigant analysis of GPY2/EPY5 tracking data.

† A deemed value.

‡ Based on evaluation research findings.

### E.3. Impact Estimate Parameters

In the course of estimating verified gross and net savings, the evaluation used a variety of parameters in its calculations. Most of the parameters for direct install measure savings calculations were deemed. Deemed values for CFLs were provided by ComEd and sourced from the Illinois TRM v1.0. For showerhead, aerator, and pipe insulation measures, the evaluation used custom input values obtained during site visits as well as deemed parameters. The evaluation used deemed values from the TRM for hot water temperature setback and programmable thermostat savings. For weatherization measure savings estimates, CSG used its own calculations in its proprietary EnergyMeasure® Home (EM HOME) software, which Navigant verified in GPY1/EPY4 (see Section

2.3 for detail). For net savings calculations, SAG deemed an overall NTGR value for Nicor Gas and measure-level NTGR values for ComEd savings. Navigant provides further overview of impact parameters in Section 2.2.

#### E.4. Impact Estimate Parameters for Future Use

In the course of our GPY2/EPY5 research, the evaluation team conducted research on parameters used in impact calculations including those in the Illinois TRM. SAG did not deem a measure-level NTGR value for programmable thermostats savings for ComEd. As a result, Navigant referenced NTGR values for comparable programs in the Northeast, shown in Table E-4. The evaluation team also determined a trade ally (TA) NTGR estimate from in-depth interviews and assessment-only participant spillover from phone surveys. The parameters shown in the table below are for future program years and were not used to calculate verified gross and net savings for GPY2/EPY5. The evaluation team’s parameters recommended for future use are further discussed in sections 4.2 and 7.3.3.

**Table E-4. Impact Estimate Parameter for Future Use**

Parameter	Value	Data Source
Programmable Thermostats NTGR – ComEd	0.90	Research Findings Sources: 2010 Gas Efficiency Annual Report by the Massachusetts Joint Utility <sup>5</sup> and Efficiency Vermont Year 2010 Savings Claim <sup>6</sup>
TA Weatherization Measure NTGR estimate (1 – Free Ridership + Spillover)	0.98 (1 - 0.07 + 0.05)	Navigant Trade Ally Interviews (n= 5 of 9 and 54% of total savings) <sup>7</sup>
Full Participant Overall Spillover	2% gas/1% electric	GPY2/EPY5 Full Participant Survey (n=104)
Assessment-only Overall Spillover	9% gas/6% electric	GPY2/EPY5 Assessment-only Survey (n=68)
Overall Program NTGR	1.05 gas (0.94 Direct Install, 1.11 Weatherization) 0.85 electric (0.80 Direct Install, 1.02 Weatherization)	Navigant GPY1/EPY4 and GPY2/EPY5 Full Participant, GPY2/EPY5 Assessment-only Participant, and GPY2/EPY5 TA Surveys

<sup>5</sup> “2010 Gas Energy Efficiency Annual Report”, Boston Gas Company, Colonial Gas Company and Essex Gas Company each d/b/a National Grid, August 2011, page 67.

<sup>6</sup> “Year 2010 Savings Claim”, Efficiency Vermont, April 1, 2011, page 162

<sup>7</sup> One trade ally’s interview results were omitted because the evaluation team believes their responses to key NTG questions were not reasonable, likely due to misunderstanding of interview questions.

### E.5. Participation Information

The GPY2/EPY5 HES program had 2,760 total participants. Table E-5 provides an overview of electric and gas measure participation during GPY2/EPY5. Overall program participation and weatherization jobs increased about 156% from GPY1/EPY4 levels.

**Table E-5. GPY2/EPY5 Primary Participation Detail**

Participation	Nicor Gas	ComEd
Participants (Assessments)	2,760 total participants	
Direct Install Measures	9,415	19,072
CFL Installations	-	18,910
Low-Flow Showerheads	2,148	41
Kitchen and Bathroom Faucet Aerators	3,856	55
Hot Water Temperature Setback	1	402
Pipe Insulation (Linear Feet)	65	2,433
Weatherization Participants	825 total participants <sup>8</sup>	

Source: Navigant analysis of GPY2/EPY5 tracking data.

### E.6. Conclusions and Recommendations

The following provides insight into key program impact and process findings and recommendations.

#### Program Savings Achievement

**Finding 1.** The GPY2/EPY5 program set to achieve net savings of 700 MWh and 545,466 therms. Navigant reports verified gross savings of 1,121 MWh and 273,900 therms and verified net savings of 973 MWh and 235,554 therms. GPY2/EPY5 verified net gas savings do not meet the original savings goals while electric savings exceed them. However, both gas and electric gross savings achieved are in line with the implementation contractor’s revised goals.

**Recommendation.** Navigant recommends adjusting program savings goals for future program years based on lessons learned in GPY2/EPY5 and the program participation and savings findings presented in this report.

#### Gross Realization Rates

**Finding 2.** Navigant reports overall gross realization rates of 100% for MWh and 108% for therms.

**Recommendation.** Navigant recommends updating ex-ante calculations for kitchen and bathroom faucet aerators based on clarifications presented in the Illinois TRM version

<sup>8</sup> These 825 weatherization jobs include 95 carry-over participants that received assessments in GPY1/EPY4.

2.0. Additionally, Navigant recommends applying programmable thermostat savings at the household level rather than per unit installed to be in line with the TRM, and to calculate ex-ante programmable thermostat education savings based on clarifications in the TRM v2.0.

### Net-to-Gross Rate

**Finding 3.** Navigant calculates overall verified net savings using SAG-deemed NTGR values of 0.87 for electric savings and 0.86 for gas savings. SAG deemed electric NTGR values on a measure-specific basis, and deemed an overall program NTGR for gas savings. The evaluation team also determined an overall research NTGR for future use of 0.85 for electric savings (0.80 Direct Install, 1.02 Weatherization) and 1.05 (0.94 Direct Install, 1.11 Weatherization) for gas savings utilizing full-participant, assessment-only participant, and trade ally research findings.

### Tracking System Review

**Finding 4.** The evaluation team found that though it is possible to identify full-participants from assessment-only participants in the tracking database judging by their measure installations, there is no unique field clearly designating full-participants from assessment-only participants.

**Recommendation.** Navigant recommends adding a field in the tracking database for participant type to distinguish full-participants from assessment-only participants. This will help ensure proper differentiation between the two participants groups in the tracking data for analysis.

### Program Participation

**Finding 5.** The GPY2/EPY5 HES program saw participation of 2,760 total home energy assessments with weatherization jobs completed at 825 residences (these 825 weatherization jobs include 95 carry-over participants that received assessments in GPY1/EPY4). This is more than double GPY1/EPY4 participation, with an increase in total participants of 156% and an increase in weatherization jobs of 158%.

### Assessment Pricing

**Finding 6.** Nine months of GPY2/EPY5 data suggest that promoting the HES program with a \$49 (participant) assessment cost is a cost-effective way to bring participants into the HES program.

**Recommendation.** Navigant recommends that Nicor Gas and ComEd retain the \$99 assessment pricing and selectively lower assessment pricing to \$49 to increase participation as necessary.

### Incentive Level

**Finding 7.** Navigant determined that conversion rates and average savings per household did not increase between GPY1/EPY4 and GPY2/EPY5 despite an increase in incentive levels from \$1,250 to \$1,750. Other program factors in GPY2/EPY5, described below, may have depressed the conversion rate.

**Recommendation.** Navigant recommends Nicor Gas and ComEd continue with the increased incentive level with the expectation that these incentives, when combined with improvements described below will, increase conversions and lead to deeper savings per participant.

### Full Participation Barriers

**Finding 8.** Though the program generally rated high in satisfaction, the lowest satisfaction score for both full participants and assessment-only participants was “the time it took to schedule the Home Energy Savings program assessment.” Some assessment-only participants may have been deterred from full participation due to scheduling and follow-up issues. While CSG added assessors to reduce participant wait times, wait times still remained high and pressure on the assessors to complete assessments appears likely to have impacts on program conversion rates.

**Recommendation.** Navigant recommends addressing any aspects of program processes that may be causing assessment scheduling, post-assessment application processing, or weatherization contractor assignment delays. Ensuring sufficient assessor staffing levels may help alleviate assessment scheduling delays. Navigant recommends that CSG allow the number of assessors to increase or decrease as needed according to participation demand. In addition, the program may increase conversion rates by ensuring proper during-assessment weatherization support and by conducting post-assessment follow-up communications to maintain participant interest in the program and to ensure their understanding of participation procedures.

### EI2 House Party Outreach

**Finding 9.** EI2 house party participants accounted for 13% of participants, about 10% of program savings, and participants were generally more satisfied with the program and understood the participation process and program offerings better than Non-EI2 house party participants. On the other hand, EI2 house party participant conversion rates were considerably lower than non-participant rates.

**Recommendation.** With EI2’s withdrawal from the program, Navigant recommends CSG assess the benefits and costs of replicating key components of the house party outreach model and identifying other ways of leveraging community-based outreach approaches.

### Future Evaluation Risk

**Finding 10.** Given that GPY2/EPY5 and GPY3/EPY6 NTGR are based on GPY1/EPY4 research, Navigant has reason to believe that future NTGR research may yield notably different results given interim changes in incentive levels, assessment pricing, and/or outreach methods.

**Recommendation.** The above should be taken into consideration when planning program changes.

Overall the program performed well in GPY2/EPY5 relative to GPY1/EPY4. Assessment participation, weatherization participation, and electric savings targets were met, though therms savings goals were not met compared to the original savings goal. GPY2/EPY5 therm savings narrowly fell short of CSG’s revised goals. Areas for program improvement generally concern streamlining the program sign-up processes, including improving scheduling, and helping assessment-only customers understand the program and their assessment results to help convince them to participate in full weatherization work.

## 1. Introduction

### 1.1 Program Description

The Home Energy Savings (HES) program is a joint program of Nicor Gas and Commonwealth Edison (ComEd), with Nicor Gas leading the program implementation. In GPY2/EPY5<sup>9</sup>, the HES program sought to achieve 545,466 therms and 700 MWh of net savings<sup>10</sup> through the implementation of home energy assessments to promote discounted weatherization services and the direct installation of energy efficiency measures in residential Nicor Gas and/or ComEd in Nicor gas territory single-family home residences or two to four unit buildings. To meet these goals, the implementation contractor, Conservation Services Group (CSG), planned to complete approximately 2,203 whole-home assessments to achieve approximately 749 completed jobs in the second program year that ended May 31, 2013.

#### 1.1.1 Implementation Strategy

The HES program provides discounted whole-home assessments (e.g., energy assessments) to customers to identify opportunities for installing energy efficiency measures and weatherizing the home. Program activities are implemented through CSG staff and contracted weatherization providers. During the assessment, CFLs, showerheads, aerators, hot water temperature setback, programmable thermostat setting, and pipe insulation were directly installed at no additional charge for instant energy savings. A programmable thermostat was also offered at a reduced price for interested participants. CSG's dedicated assessment staff generate a recommendation report for customers using proprietary software that takes into account customer home characteristic information. The customer report outlines recommended measures, potential savings, payback periods, and the amount of incentives available for recommended work. Customers choose the projects they would like to pursue. A program-eligible contractor is then assigned to perform the work and discounts are offered instantaneously. The contractor is responsible for submitting paperwork to CSG to receive rebate funds. Customers who pursued weatherization projects in GPY2/EPY5 were eligible to receive incentives of 70% of costs for the recommended weatherization upgrades (up to \$1,750 per home).

#### 1.1.2 Program Marketing and Outreach

The Home Energy Savings program utilizes an integrated marketing plan that includes website content, direct mail promotions to residents, and some community events along with direct promotion by weatherization contractors. The marketing message stresses the importance of homeowners' need to care for their home investment and energy performance. Messaging focuses on getting customers to take advantage of the program's key benefits, savings, and comfort. Trade allies also benefit from the program by having credibility established through participating with the utilities. Furthermore, the program provides program-related administrative and technical training, and standardizes high-quality practices in the market through a quality assurance and control

<sup>9</sup> Gas Program Year 2/Electric Program Year 5

<sup>10</sup> These savings targets were set before GPY1/EPY4 as part of a three year plan and were revised with the implementation contractor in GPY2/EPY5. This report uses the savings figures from the original three year plan and makes note of performance relative to the revised IC goals.

(QA/QC) process. In GPY2/EPY5, the program partnered with Energy Impact Illinois (EI2) which hosted informational “house parties” where program contractors and EI2 staff presented information on the program as an additional outreach avenue for potential participants.

## 1.2 Evaluation Objectives

The Evaluation Team identified the following key researchable questions for GPY2/EPY5:

### 1.2.1 Impact Questions

1. What is the level of verified gross and net annual energy (kWh and therm) savings induced by the program?
2. What are the net impacts from the program, especially among assessment-only participants?<sup>11</sup> What is the level of free ridership associated with this program and how can it be reduced? What is the level of spillover associated with this program, including non-participant spillover?
3. Did the program meet its energy and demand savings goals? If not, why not?
4. Are the assumptions and calculations for the direct-install measures in compliance with the statewide TRM and reflective of sound engineering judgment for both gas and electric impacts? If not, what changes are required?

### 1.2.2 Process Questions

1. Has the program changed since GPY1/EPY4, and if so, why and how?
2. What effects have the assessment pricing and weatherization incentive amounts had to date on conversion rates and measure installations? How will an incentive move to 70% from 50% affect program uptake?
3. What effect did EI2’s informational parties have on participation and conversion rates? What will be the impact of their discontinuation? Is there a low cost way to maintain the benefits?
4. Why did assessment-only participants not follow through with weatherization work and what can be done to encourage their participation in future program years?

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<sup>11</sup> Ultimately, the evaluation team did not conduct participant free ridership research in GPY2/EPY5 at the request of Nicor Gas. The IL SAG deemed GPY2/EPY5 NTG values.



## 2. Evaluation Approach

This evaluation of the HES program reflects the second full-scale year of joint program operation. The evaluation team conducted both primary and secondary research to address key impact and process questions.

### 2.1 Overview of Data Collection Activities

The core data collection activities included in-depth interviews with program staff and trade allies, participant surveys, and post-assessment quality assurance and quality control (QAQC) verification ride-alongs. The full set of data collection activities is shown in the following table.

**Table 2-1. Core Data Collection Activities**

Method	Subject	Quantity	Date	Gross Impacts	Net Impacts	Process
Telephone Survey	Assessment-only participants (GPY1/EPY4 and early GPY2)	68 including both GPY1/EPY4 and GPY2/EPY5 participants	Late Spring/ Early Summer 2013	X	X	X
Telephone Survey	Full Participants (includes EI2 info party participants)	104 (stratified between EI2 and non-EI2 participants)	Late Spring/ Early Summer 2013	X	X	X
In-Depth Telephone Interviews	Program manager and IC staff	3-4	Spring 2013	X		X
In-Depth Telephone Interview	Participating weatherization subcontractors	5	Late Spring/Early Summer 2013		X	X
Verification Ride-alongs	CSG QAQC Staff	2 sites	Early June 2013			X

### 2.2 Verified Savings Parameters

Navigant calculated verified gross direct install savings from the GPY2/EPY5 HES program using algorithms, assumptions, and parameters defined in the Illinois TRM version 1.0. Additionally, Navigant sourced HVAC and water heating variables from the tracking database provided by CSG. Navigant used SAG-deemed NTGR to calculate verified net savings. The key parameters used in the analysis are shown in Table 2-2.



**Table 2-2. Impact Estimate Parameters**

Parameter	Value	Data Source	Deemed, Evaluated, or Research Findings
NTGR – Nicor Gas All Measures	0.86	SAG Spreadsheet †	Deemed
NTGR – ComEd CFLs	0.89	SAG Spreadsheet ‡	Deemed
NTGR – ComEd Water Savings Measures	0.94	SAG Spreadsheet ‡	Deemed
NTGR – ComEd Weatherization Measures	0.8	SAG Spreadsheet ‡	Deemed
CFL In-Service Rate	0.97	Illinois TRM, v1.0, Section 5.5.1	Deemed
Showerhead In-Service Rate	0.98	Illinois TRM, v1.0, Section 5.4.5	Deemed
Faucet Aerators In-Service Rate	0.95	Illinois TRM, v1.0, Section 5.4.4	Deemed

†*Nicor Gas – Net-to-Gross Results and Application, GPY1-3, Table 1 (Revised). July 2, 2013*

‡ [http://ilsagfiles.org/SAG\\_files/Meeting\\_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls](http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls)

Version 1.0 of the Illinois TRM does not include a discussion of savings for the programmable thermostat education measure. However, version 2.0 of the Illinois TRM defines the programmable thermostat measure to include programmable thermostat education. Navigant referenced version 2.0 of the TRM to determine verified savings for the programmable thermostat education measure for GPY2/EPY5.

### 2.3 Verified Gross Program Savings Analysis Approach

For direct install measures in GPY2/EPY5, Navigant performed an engineering review. CSG provided the original tracking data and updated savings adjustments for direct install measures based on the Illinois TRM version 1.0.

For weatherization projects, in GYP1/EPY4 Navigant performed a thorough literature review to compare evaluated savings values for projects with weatherization offerings similar to the HES program. Based on the findings from the literature review, Navigant determined that the savings values from CSG’s EnergyMeasure® HOME (EM HOME) model compare favorably with evaluated savings for similar programs and climates. Navigant accepts CSG’s weatherization measure savings assumptions for GPY2/EPY5. Further detail on Navigant’s weatherization literature review can be found in the GY1/EP4 HES Report.<sup>12</sup>

### 2.4 Verified Net Program Savings Analysis Approach

Verified net energy savings were calculated by multiplying the Verified Gross Savings estimates by a net-to-gross ratio (NTGR). For GPY2/EPY5, the evaluation team used NTGR values that were based

<sup>12</sup> Energy Efficiency ComEd Plan Year 4, Nicor Gas Plan Year 1 (6/1/2011-5/31/2012) evaluation Report: Home Energy Savings Program. May 2013.

on past evaluation research and defined through a negotiation process through SAG.<sup>13</sup> Navigant also researched free ridership and spillover from the TA perspective, and spillover from full participants and assessment-only participants for future NTGR estimates.

## 2.5 Process Evaluation including QAQC Verification Ride-Along

Whereas GPY1/EPY4 process evaluation activities included a particular focus on non-participant outreach and marketing effectiveness, GPY2/EPY5 process activities focused on better understanding full and assessment-only participation, including optimizing program conversion rates, assessment pricing, and incentive levels. Navigant’s evaluation also researched the dynamics of the EI2 house parties.

While the GPY1/EPY4 telephone interviews targeted full participants only, the GPY2/EPY5 evaluation involved telephone interviews with both full participants and assessment-only participants, with an emphasis on better understanding the latter group. The assessment-only survey was stratified between GPY1/EPY4 and GPY2/EPY5 participants, and the full participant survey was stratified between EI2 house party and non-EI2 house party referred participants.

Though trade ally interviews focused primarily on net impact-related questions, the evaluation team also touched on key process questions. Detailed results from trade ally interviews are outlined in Appendix 7.3.

Navigant also conducted two ride-along verification checks with CSG post-assessment QAQC staff to verify CSG’s QAQC activities. Navigant compared field observations of CSG staff’s QAQC inspection activities against best practices and the protocols outlined in the program operations manual. An overview of findings is included Section 5.1, and the complete memo of findings is included as an attachment in Appendix 7.5.

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<sup>13</sup> [http://ilsagfiles.org/SAG\\_files/Meeting\\_Materials/2013/August%205-6,%202013%20Meeting/Nicor\\_Gas\\_NTG\\_Results\\_and\\_Application\\_GPY1-3.pdf](http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August%205-6,%202013%20Meeting/Nicor_Gas_NTG_Results_and_Application_GPY1-3.pdf)

### 3. Gross Impact Evaluation

In this section Navigant presents verified savings for the GPY2/EPY5 HES program. Navigant performed a tracking system review on the original tracking system provided by CSG and calculated verified gross program savings. Navigant determined the following findings and recommendations:

#### Tracking System Review

**Finding 1.** The evaluation team found that though it is possible to identify full-participants from assessment-only participants in the tracking database judging by their measure installations, there is no unique field clearly designating full-participants from assessment-only participants.

**Recommendation.** Navigant recommends adding a field in the tracking database for participant type to distinguish full-participants from assessment-only participants. This will help ensure proper differentiation between the two participants groups in the tracking data for analysis.

#### Ex-ante Savings

**Finding 2.** The evaluation team calculated ex-ante gross savings from the tracking system ex-ante gross savings values of 253,445 therms and 1,122 MWh.

#### Verified Gross Savings

**Finding 3.** Navigant calculated overall gross impact savings of 273,900 therms and 1,121 MWh, respectively.

#### Verified Gross Realization Rates

**Finding 4.** Navigant reports an overall gross realized savings rate of 108% for therm savings and 100% for electric savings.

**Recommendation.** Navigant recommends updating ex-ante calculations for kitchen and bathroom faucet aerators based on clarifications presented in the Illinois TRM version 2.0. Additionally, Navigant recommends applying programmable thermostat savings at the household-level rather than per unit installed and to calculate ex-ante programmable thermostat education savings based on clarifications in the TRM v2.0.

### 3.1 Tracking System Review

For the GPY2/EPY5 evaluation, Navigant reviewed the tracking system provided by CSG to verify the completeness and accuracy of the tracking system data and to identify any issues that would affect the impact evaluation of the HES program. CSG provided ex-ante electric savings in the original CSG tracking database and also provided a companion spreadsheet with recalculated ex-ante gross therm savings for direct install measures based on the parameters and algorithms in the Illinois TRM version 1.0. Navigant found these documents sufficient to complete the gross impact evaluation of the HES program.

Key findings from the tracking system review include:

1. Navigant identified one project with claimed ex-ante electric savings that had a gas hot water heater. Navigant reassigned savings to gas for this participant.
2. Navigant identified several project entries with erroneous pipe length entries of over 9 ft. CSG clarified that these were data entry errors. Navigant updated ex-ante savings to cap the pipe insulation savings to 9 ft. (6 ft. on the hot water pipe and 3 ft. on the cold water pipe).
3. Navigant identified nine projects with ex-ante savings claimed for multiple programmable thermostats. Navigant capped ex-ante deemed savings at one programmable thermostat per household.
4. Navigant identified multiple programmable thermostat education participants that were cross-listed with the programmable thermostat participants. In the case where the tracking system had crossover participants for a new programmable thermostat and for thermostat education, Navigant applied the thermostat savings to the programmable thermostat measure.
5. Navigant determined that it would be helpful for the evaluation team if there were a field in the tracking database designating full-participants and assessment-only participants.

Table 3-1 below shows the ex-ante energy savings claimed for the HES program for GPY2/EPY5, including both direct install and weatherization measures. The number of participants and the number of installed units among participants with gas water heaters and electric water heaters are also included for each measure.

**Table 3-1. GPY2/EPY5 Ex-Ante Gross Impact, by Measure**

	Measure	Total Participants GWH/EWH†	Installed Units GWH/EWH†	Therms	MWh
Direct Install Measures	9 Watt CFL	0/639	0/2473	0	74
	14 Watt CFL	0/1398	0/6068	0	269
	19 Watt CFL	0/750	0/2444	0	132
	23 Watt CFL	0/810	0/2587	0	122
	9 Watt Globe CFL	0/794	0/5338	0	211
	Shower Head	1361/26	2148/41	47,053	19
	Kitchen Aerator	284/7	332/9	792	0
	Bathroom Aerator	1526/24	3524/46	8,143	2.2
	Hot Water Temperature Setback	388/1	402/1	2,566	0.4
	Pipe Insulation	1244/32	2433/65*	7,903	3.9
	Programmable Thermostat	99/0	107/0	5,637	-‡
	Programmable Thermostat Education	463/0	469/0	0‡	-‡
	Subtotal			9415/19072	72,095
Weatherization Measures	Attic Insulation	-	-	82,645	119
	Wall Insulation	-	-	16,150	1.7
	Floor Insulation (Other)	-	-	12,933	3.1
	Duct Insulation & Sealing	-	-	76	1.6
	Air Sealing	-	-	69,546	163
Subtotal		-	-	181,350	288
<b>Total</b>				<b>9415/19072</b>	<b>253,445</b>

Source: Navigant analysis of GPY2/EPY5 tracking data.

†Participants and installed units broken out for participants with gas and electric hot water heaters. The first number represents the participants or installed units for gas water heaters, and the second number is for electric water heaters.

‡ Programmable thermostats were not included as an electric measure by ComEd in EPY5. Nicor Gas did not claim savings for programmable thermostat education in GPY2/EPY5. Navigant estimated savings for the measure as discussed in appendix 7.2.1.

\*Installed units for pipe insulation is reported in 3 ft. segments

### 3.2 Program Volumetric Findings

In order to better understand measure installation patterns, the evaluation team looked at the homes that installed each measure as a percentage of total homes that received an assessment. Table 3-2 below shows the percentage of assessed homes that installed each measure offered in the HES program. In GPY2/EPY5, 2,760 participants received an assessment. CFLs, pipe insulation, bathroom aerators, and showerheads were the most common direct install measures, while attic insulation and air sealing were the most common weatherization measures. The least common direct install measure

was the programmable thermostat, and the least common weatherization measures were wall insulation and duct insulation and sealing.

**Table 3-2. Percent of Participating Home Installing Each Program Measure Type, GPY2/EPY5**

	Measure	Total Participants	Percent of Participating Homes Installing Measure
Direct Install Measures	Assessment Fee	2,760	100%
	All CFL Types	2,196	80%
	Shower Head	1,387	50%
	Kitchen Aerator	292	11%
	Bathroom Aerator	1,550	56%
	Hot Water Temperature Setback	389	14%
	Pipe Insulation	1,276	46%
	Programmable Thermostat	99	4%
	Programmable Thermostat Education	463	17%
Weatherization Measures	Attic Insulation	820	30%
	Wall Insulation	66	2%
	Floor Insulation (Other)	444	16%
	Duct Insulation & Sealing	12	0.4%
	Air Sealing	812	29%

Source: Navigant analysis of GPY2/EPY5 tracking data.

According to revised GPY2/EPY5 program goals, the program set out to achieve participation goals of 2,203 assessments and 749 weatherization jobs. After review of the tracking system, Navigant reports participation in the HES program in GPY2/EPY5 of 2,760 assessments and 825 weatherization jobs.

Table 3-3 shows the program participation and goal comparison between GPY1/EPY4 and GPY2/EPY5. Table 3-4 shows the verified comparison between GPY1/EPY4 and GPY2/EPY5.

**Table 3-3. GPY1/EPY4 and GPY2/EPY5 Program Participation Goals Comparison**

GPY1/EPY4 June 2011 – May 2012	GPY2/EPY5 June 2012 – May 2013
2,100 Audits	2,203 Audits
630	749
Weatherization	Weatherization
Jobs	Jobs

Source: GPY1/EPY4 goals are based on Nicor Gas Rider 30 EEP Program Portfolio Operating Plan v.1.1, January 24, 2012, pp77-78. GPY2/EPY5 goals are based on figures reported by Nicor Gas to Navigant by way of internal communication.

**Table 3-4. GPY1/EPY4 and GPY2/EPY5 Verified Program Participation Comparison**

GPY1/EPY4 June 2011 – May 2012	GPY2/EPY5 June 2012 – May 2013
1,080 Audits	2,760 Audits
320	825 <sup>14</sup>
Weatherization	Weatherization
Jobs	Jobs

Source: Navigant analysis of GPY1/EPY4 and GPY2/EPY5 tracking data.

### 3.3 Gross Program Impact Parameter Estimates

Navigant calculated verified gross savings from the GPY2/EPY5 HES program using algorithms and parameters defined in the Illinois TRM versions 1.0 and 2.0. Navigant used the Illinois TRM for all direct install measures except for programmable thermostat education. Programmable thermostat education is not defined in the TRM v1.0. However, the Illinois TRM v2.0 includes additional clarification for programmable thermostat education savings.

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<sup>14</sup> The results include 95 GPY1/EPY4 audit participants that received weatherization work in GPY2/EPY5 and thus contributed to GPY2/EPY5 weatherization savings. Navigant when these GPY1/EPY4 audit participants are excluded from certain GPY2/EPY5 process analyses.

**Table 3-5. Verified Gross Savings Parameters**

Measure	Deemed Input Parameter Source
All CFL Types	Illinois TRM v1.0 - Section 5.5.1
Shower Head	Illinois TRM v1.0 - Section 5.4.5
Kitchen Aerator	Illinois TRM v1.0 - Section 5.4.4
Bathroom Aerator	
Hot Water Temperature Setback	Illinois TRM v1.0 - Section 5.4.6
Pipe Insulation	Illinois TRM v1.0 - Section 5.4.1
Programmable Thermostat	Illinois TRM v1.0 - Section 5.3.10
Programmable Thermostat Education	Illinois TRM v2.0 - Section 5.3.11

The GPY2/EPY5 CSG tracking database provided all input parameters necessary to calculate savings using the Illinois TRM v1.0 and 2.0 for all measure installations.

For all CFL electricity savings calculations, Navigant applied the Waste Heat Factor (WHF) savings parameter for all measure installations in residences with air conditioning. Navigant did not apply waste heat savings for residences without air conditioning, as recorded in the GPY2/EPY5 CSG program tracking database. Navigant applied the WHF only for verified electric CFL savings. Research findings savings in Section 7.2.1.3 of this report include the WHF for therm savings as well.

For all direct install water-saving measures, Navigant applied gas savings calculations for all measures installations with gas hot water system and applied electric savings for measure installations with electric hot water systems. This data was provided for each participant in the CSG GPY2/EPY5 tracking database. Additionally, Navigant applied gas savings calculations for all programmable thermostat measures installed in residences with gas space heating and applied electric savings for thermostat installations in residences with electric space heating. This methodology was used for both programmable thermostat and programmable thermostat education measures.

As an example, the Illinois TRM version 1.0 deems savings of 86.4 kWh for electric hot water heater temperature turndown, and 6.4 therms for a gas hot water heater temperature turndown. Navigant applied the deemed electric savings only to households with electric hot water heaters and applied the deemed gas savings only to households with gas hot water heaters. CSG used the same methodology in calculating ex-ante savings.

Navigant performed a thorough literature review in GYP1/EPY4 to compare evaluated savings values for projects with similar weatherization offerings as the HES program. This was done in order to ‘vet’ the ex-ante savings for weatherization measures in the HES program. Based on the findings from the literature review, Navigant determined that the savings values from CSG’s EnergyMeasure® HOME (EM HOME) model compares favorably with evaluated savings for similar



programs and climates. Navigant accepts CSG’s weatherization measure savings assumptions for GPY2/EPY5. Further detail on Navigant’s weatherization literature review can be found in the GY1/EP4 HES Report.<sup>15</sup>

### 3.4 Development of the Verified Gross Realization Rate

Navigant performed a detailed engineering review of the ex-ante savings assumptions provided by CSG and developed verified gross MWh and therm savings values for all of the direct install and weatherization measures. Adjustments to ex-ante savings values were based on assumptions and algorithms in the IL TRM version 1.0, as well as engineering judgment. Table 3-6 provides an overview of updates to the ex-ante formulas and assumptions.

**Table 3-6. GPY2/EPY5 Gross Measure Savings Methodology**

Measure	Navigant Update
All CFL Types	Navigant applied waste heat factor cooling savings (WHFe) to homes with air conditioning, as reported in the CSG tracking database. Navigant did not assign cooling WHF to homes without A/C. This adjustment is specified in the IL TRM version 1.0.
Shower Head	No adjustments to ex-ante formulas and assumptions were made.
Kitchen and Bathroom Aerators	The Illinois TRM version 2.0 includes additional example equations which further clarify the usage of specific parameters in the energy and gas savings equations. For verified gross energy and gas savings for this program year, Navigant accepted the ex-ante approach to savings calculations, and therefore did not adjust the ex-ante formulas and assumptions for the GPY2/EPY5 program year. Navigant also identified a minor error in the calculation of total faucets per household for a small number of projects in the CSG tracking database. The evaluation team updated the total faucets per household in the ex-post calculations.
Hot Water Temperature Setback	Navigant identified one project with claimed ex-ante electric savings that had a gas hot water heater. Navigant reassigned savings to gas for this participant. Navigant also updated the ex-ante deemed savings based on the IL TRM version 1.0. Deemed savings in the TRM are lower than the ex-ante deemed savings for this measure, causing a low realization rate, as shown in Table 3-7.
Pipe Insulation	Navigant identified several project entries with erroneous pipe length entries of over 9 ft. CSG clarified that these were data entry errors. Navigant updated ex-ante savings to cap the pipe insulation savings to 9 ft. (6 ft. on the hot water pipe and 3 ft. on the cold water pipe). Navigant also updated the ex-ante savings based on the IL TRM algorithms and parameters.
Programmable Thermostat	Navigant identified nine projects with ex-ante savings claimed for multiple programmable thermostats. Navigant capped ex-ante deemed savings at one programmable thermostat per household. Heating savings in the IL TRM version 1.0 is based on annual household heating consumption. Therefore,

<sup>15</sup> Energy Efficiency ComEd Plan Year 4, Nicor Gas Plan Year 1 (6/1/2011-5/31/2012) evaluation Report: Home Energy Savings Program. May 2013.

Measure	Navigant Update
	based on the current definition of savings in the TRM, Navigant’s judgment is that multiple programmable thermostats installed in the same household should not be given multiple units of savings.
Programmable Thermostat Education	No ex-ante savings were claimed for the programmable thermostat education measure. The IL TRM version 2.0 clarifies the deemed programmable thermostat savings measure to also include savings for participants who were taught how to use setback schedules with a programmable thermostat who were previously using the thermostat as a manual, non-programmed thermostat. Navigant identified multiple programmable thermostat savings participants that were cross-listed with the programmable thermostat participants. In the case where the tracking system had crossover participants for a new programmable thermostat and for thermostat education, Navigant applied the thermostat savings to the programmable thermostat measure. This effectively eliminated the thermostat savings for the education component of the measure for cross-listed participants.
Weatherization Measures	No adjustments to ex-ante formulas and assumptions were made. Navigant performed verification in GPY1/EPY4 of CSG’s EnergyMeasure® HOME (EM HOME) software used to calculate weatherization savings.

The verified gross realization rate is the ratio of verified gross savings to ex-ante gross savings from the program tracking system.

As shown in Table 3-7 below, the GPY2/EPY5 verified savings was 273,900 therms and 1,121 MWh, resulting in verified gross realization rates of 108% for therms and 100% for MWh, respectively. The HES program did not claim ex-ante savings for the programmable thermostat education measure. Navigant assigned verified savings for this measure, causing the verified gross realization rate to be over 100% for therms.

### 3.5 Verified Gross Program Impact Results

This section details the results of Navigant’s verified gross impact analysis for the HES program. Navigant calculated verified gross savings with algorithms and assumptions based on the Illinois TRM version 1.0 and, for programmable thermostat education, TRM version 2.0. This includes applying the TRM-specified in-service rates for direct install measures. Verified gross savings for weatherization measures all use an in-service rate of 1, where CSG’s QAQC findings inform the installation rates, and a persistence rate of 1 is assumed since weatherization measure uninstallation is unlikely. Table 3-7 summarizes the verified gross results by measure type.<sup>16</sup>

<sup>16</sup> The evaluation team calculated an alternative savings estimate for the program as a whole in Appendix 0, which utilizes Navigant’s measure-level installation and persistence rate findings for direct install measures rather than the IL TRM. This was done for reference purposes only.

**Table 3-7. GPY2/EPY5 Verified Gross Impact Savings Estimates by Measure Type**

	Measure	Therms	Therms RR*	MWh	MWh RR*
Direct Install Measures	9 Watt CFL	0	-	74	100%
	14 Watt CFL	0	-	268	100%
	19 Watt CFL	0	-	131	100%
	23 Watt CFL	0	-	122	100%
	9 Watt Globe CFL	0	-	211	100%
	Shower Head	47,053	100%	19	101%
	Kitchen Aerator	758	96%	0.4	118%
	Bathroom Aerator	8,307	102%	2.5	113%
	Hot Water Temperature Setback	2,573	100%	0.1	23%
	Pipe Insulation	7,583	96%	4.7	121%
	Programmable Thermostat	5,216	93%	‡	-
Programmable Thermostat Education	21,060 †	-	‡	-	
Subtotal		92,550	128%	833	100%
Weatherization Measures	Attic Insulation	82,645	100%	119	100%
	Wall Insulation	16,150	100%	1.7	100%
	Floor Insulation (Other)	12,933	100%	3.1	100%
	Duct Insulation & Sealing	76	100%	1.6	100%
	Air Sealing	69,546	100%	163	100%
Subtotal		181,350	100%	288	100%
Total	Total Savings	273,900	108%	1121	100%

Source: Navigant analysis of GPY2/EPY5 tracking data.

\*RR = Realization Rate. This is the ratio of verified gross to ex-ante gross savings.

†The program did not claim any savings for the programmable thermostat measure which results in an overall realization rate that is above 1.0, even though all individual measures have a realization rate below 1.0.

‡ Programmable thermostats were not included as an electric measure by ComEd in EPY5.

Low-flow showerheads by far accounted for the most direct install therm savings as a percentage of total direct install therm savings, followed by programmable thermostat education, bathroom aerators, and pipe insulation. CFLs, especially 9-watt globe and 14-watt spiral, accounted for most of the electric savings in the direct install measure category. Amongst weatherization measures, attic insulation and air sealing accounted almost all gas and electric savings.

## 4. Net Impact Evaluation

This section details the results of Navigant’s verified net impact analysis for the HES program, which includes adjustments for both free ridership and spillover in the net-to-gross analysis. Navigant presents the following key overall finding:

### Verified Net Savings:

**Finding 1.** Navigant reports verified net savings of 973 MWh and 235,554 therms.

### Research Findings NTGR:

**Finding 2.** Navigant determined an overall program electric research finding NTGR of 0.85 and gas NTGR of 1.05 by consolidating GPY1/EPY4 full-participant FR, GPY2/EPY5 full-participant SO, GPY2/EPY5 assessment-only SO, and GPY2/EPY5 TA FR and SO interview feedback.

### 4.1 Verified Net Savings

Navigant used the NTGR values shown in Table 4-1 to calculate verified net savings.

**Table 4-1. GPY2/EPY5 Nicor Gas and ComEd Deemed NTGR Values**

Parameter	Value	Data Source	Deemed, Evaluated, or Research Findings
NTGR – Nicor Gas All Measures	0.86	SAG Spreadsheet †	Deemed
NTGR – ComEd CFLs	0.89	SAG Spreadsheet ‡	Deemed
NTGR – ComEd Water Savings Measures	0.94	SAG Spreadsheet ‡	Deemed
NTGR – ComEd Weatherization Measures	0.80	SAG Spreadsheet ‡	Deemed

† [http://ilsagfiles.org/SAG\\_files/Meeting\\_Materials/2013/August%205-](http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August%205-6,%202013%20Meeting/Nicor_Gas_NTG_Results_and_Application_GPY1-3.pdf)

[6,%202013%20Meeting/Nicor\\_Gas\\_NTG\\_Results\\_and\\_Application\\_GPY1-3.pdf](http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August%205-6,%202013%20Meeting/Nicor_Gas_NTG_Results_and_Application_GPY1-3.pdf)

‡ [http://ilsagfiles.org/SAG\\_files/Meeting\\_Materials/2013/August 5-6, 2013 Meeting/ComEd PY5-PY6 Proposal Comparisons with SAG.xls](http://ilsagfiles.org/SAG_files/Meeting_Materials/2013/August%205-6,%202013%20Meeting/ComEd_PY5-PY6_Proposal_Comparisons_with_SAG.xls)

Navigant applied the NTGR values above to verified gross measure savings to determine measure-specific verified net program savings, shown in Table 4-2.

**Table 4-2. GPY2/EPY5 Verified Net Impact Savings Estimates by Measure Type**

	Measure	Therms	Therms NTGR	MWh	MWh NTGR
Direct Install Measures	9 Watt CFL	0	-	66	89%
	14 Watt CFL	0	-	239	89%
	19 Watt CFL	0	-	117	89%
	23 Watt CFL	0	-	108	89%
	9 Watt Globe CFL	0	-	187	89%
	Shower Head	40,466	86%	18	94%
	Kitchen Aerator	652	86%	0.4	94%
	Bathroom Aerator	7,144	86%	2.3	94%
	Hot Water Temperature Setback	2,213	86%	0.1	94%
	Pipe Insulation	6,521	86%	4.4	94%
	Programmable Thermostat	4,486	86%	0	-
	Programmable Thermostat Education	18,112	-	0	-
Subtotal		79,593	86%	742	89%
Weatherization Measures	Attic Insulation	71,075	86%	95	80%
	Wall Insulation	13,889	86%	1.4	80%
	Floor Insulation (Other)	11,122	86%	2.5	80%
	Duct Insulation & Sealing	65	86%	1.3	80%
	Air Sealing	59,809	86%	130	80%
Subtotal		155,961	86%	230	80%
Total	Total Savings	235,554	86%	973	87%

Source: Navigant analysis of GPY2/EPY5 tracking data.

All told, GPY2/EPY5 program net impacts, using evaluated parameters, are 235,554 therms and 973 MWh. The combined effect of the gross impact realization rates and net-to-gross ratios on the HES program results in verified net savings that are 93% and 87% of ex-ante therms and kWh savings, respectively.

## 4.2 Impact Estimate Parameters for Future Use

In the course of our GPY2/EPY5 research, the evaluation did research on parameters used in impact calculations including those in the Illinois TRM. Some of those parameters are eligible for deeming for future program years or for inclusion in future versions of the TRM and were not used to calculate verified gross savings for GPY2/EPY5. The evaluation team’s parameters recommended for future use are shown in Table 4-3.

**Table 4-3. Impact Estimate Parameters for Future Use**

Parameter	Value	Data Source
Programmable Thermostats NTGR – ComEd	0.90	Research Findings Sources: 2010 Gas Efficiency Annual Report by the Massachusetts Joint Utility <sup>17</sup> and Efficiency Vermont Year 2010 Savings Claim <sup>18</sup>
TA Weatherization Measure NTGR estimate (1 – FR + SO)	0.98 (1 - 0.07 + 0.05)	Navigant Trade Ally Interviews (n= 5 of 9 and 54% of total savings) <sup>19</sup>
Full Participant Overall Spillover	2% gas/1% electric	GPY2/EPY5 Full Participant Survey (n=104)
Assessment-only Overall Spillover	9% gas/6% electric	GPY2/EPY5 Assessment-only Survey (n=68)
Overall Program NTGR	1.05 gas (0.94 Direct Install, 1.11 Weatherization) 0.85 electric (0.80 Direct Install, 1.02 Weatherization)	Navigant GPY1/EPY4 and GPY2/EPY5 Full Participant, GPY2/EPY5 Assessment-only Participant, and GPY2/EPY5 TA Surveys

SAG did not deem a programmable thermostats NTGR value for ComEd in EPY5. For GPY2/EPY5, programmable thermostats were not installed in electrically-heated homes. If programmable thermostats are installed in electrically-heated homes in future program years, Navigant recommends using a deemed NTGR value of 0.90 for the programmable thermostats measure, based on an average NTGR value from comparable programs as shown above in Table 4-3.

Additionally, the Illinois TRM version 2.0 includes additional example equations which further clarify the usage of specific parameters in the energy and gas savings equations for kitchen and bathroom faucet aerators. CSG did not apply these factors in GPY2/EPY5. Navigant recommends using these parameters in future program years. A full discussion is presented in Appendix 7.2.1.1.

Navigant determined a TA weatherization measure NTGR of 0.98, consisting of a 7% free ridership estimate and a 5% volume increase spillover. Navigant also gauged full participant and assessment-only participant spillover and found 2% gas and 1% electric full participant overall spillover and 9% gas and 6% electric assessment-only participant overall spillover. Navigant consolidated full-participant, assessment-only, and trade ally NTGR feedback into an overall program NTGR of 1.05 for gas, and 0.85 for electric. See sections 4.2.1, 4.2.2, and 4.2.3 for methodology detail and a discussion of findings.

<sup>17</sup> “2010 Gas Energy Efficiency Annual Report”, Boston Gas Company, Colonial Gas Company and Essex Gas Company each d/b/a National Grid, August 2011, page 67.

<sup>18</sup> “Year 2010 Savings Claim”, Efficiency Vermont, April 1, 2011, page 162

<sup>19</sup> One trade ally’s interview results were omitted because the evaluation team believes their responses to key NTG questions were not reasonable, likely due to misunderstanding the questions.

#### 4.2.1 Trade Ally Weatherization NTGR Calculation Methodology and Results

The trade ally NTGR methodology was based on the one used for the GPY1/EPY4 Home Energy Efficiency Rebate (HEER) program evaluation. The evaluation team made modifications given the HES program provides weatherization measures wherein conversion rates and participation volume are key criteria in establishing free ridership rather than the adoption and sales of energy efficient equipment in higher efficiency measure promoting rebate programs such as HEER.

##### Trade Ally Perspective of Participant Free Ridership

To calculate participant free ridership using data obtained from the trade ally interviews<sup>20</sup>, the trade allies were asked about their pre-program and post-program leads, converted projects, and projects outside of the program to determine a market share free ridership. The market share free ridership estimates the number of projects that a contractor had in the program in the current year that would have otherwise been part of the contractor’s participants even without the program. Contractors that had fewer projects in the past than the current total number of projects outside of the program are given a zero free ridership because the program has led to a considerable increase in project volume.

$$\text{Market Share FR} = \frac{[\text{PAST \# OF PROJECTS}] - [\text{TOTAL \# OF PROJECTS OUTSIDE OF PROGRAM}]}{[\text{TOTAL NUMBER OF CURRENT PROJECTS}]}$$

The evaluation team then calculated an alternate free ridership based on the contractor’s likelihood for implementing the same number of measures without the program and their perception of the program’s influence on customers’ decision to implement weatherization measures.

$$\text{Alternate FR} = \frac{[\text{PROGRAM INFLUENCE SCORE}] - (10 - [\text{PROGRAM IMPORTANCE SCORE}])}{20}$$

The evaluation team then averaged the two free ridership scores to estimate an overall free ridership score per contractor.

##### Participating Trade Ally Volume Increase Spillover

The evaluation team calculated spillover that may have occurred due to an increase in contractor customer volume due to program influence that may have not participated in the program. To calculate participating trade ally spillover using data obtained from the trade ally interviews, the trade allies were asked to estimate approximately what percentage of their leads followed through with weatherization work prior to the program and after the program. Then their self-reported estimate for the percentage of customers that are currently outside of the program was used to estimate potential volume increase spillover.

$$SO = ([\text{Current Conversion Rate}] - [\text{Preprogram Conversion Rate}]) * [\% \text{ Customers Outside of Program}]$$

By determining the change in TA conversion rates between GPY2/EPY5 and their pre-program conversion rates and multiplying it against the current percentage of customers outside of the

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<sup>20</sup> Please see Appendix 0 for the survey instrument



program, the evaluation team estimated potential spillover that has resulted from the program increasing contractor conversion rates. Other qualitative spillover insights due to the program’s potential influence on the adoption of higher installation standards and on non-participating contractors are provided in the TA interview results discussion in Appendix 7.3.3.

Participating Trade Ally Weatherization NTGR Findings

Using the methods outlined above, Navigant determined a trade ally free ridership of 7% and participation volume increase spillover of 5% for weatherization measures. The resulting overall trade ally weatherization NTGR amounts to 0.98.<sup>21</sup>

**Table 4-4. Trade Ally Weatherization NTGR**

	FR	SO	NTGR
GPY2/EPY5 TA Research	0.07	0.05	0.98

*Source: Navigant analysis of GPY2/EPY5 TA Research*

**4.2.2 Full Participant and Assessment-only Spillover Methodology and Results**

Navigant conducted full participant and assessment-only phone surveys to determine the HES program’s spillover effects on both direct-install measures and weatherization measures.<sup>22</sup> The evaluation team was particularly interested in identifying to what extent the program’s assessments were influential in encouraging the installation of weatherization measures outside of the program. The evaluation team did not conduct assessment-only participant free-ridership research under the assumption that their direct install free ridership would be comparable to full participants. Weatherization measure free ridership for assessment-only participants is not applicable since they did not pursue weatherization measures through the program.

Spillover Calculation Methodology

The evaluation team conducted a phone survey where the surveyor asked full participant and assessment-only participants whether they had installed additional direct install and/or weatherization measures after participating in an assessment. Individuals that responded in the affirmative were asked to identify what measures they installed and how influential on a scale of zero to ten the program was in their decision to install those measures, ten being “very influential.” Participants that reported a score of eight or higher were eligible for program spillover. Navigant then looked at spillover-eligible participant-specific responses to identify whether their spillover savings should be attributed to gas or electric savings depending on their home’s heating fuel source in order to avoid double-counting savings. The evaluation team further determined spillover eligibility by comparing respondent reported-spillover measures against their tracking system installed measures. Spillover was not counted for participants that already had a weatherization measure installed as part of the program (with the exception of respondents that reported installing additional insulation to make up for program constraints).

The evaluation team assigned electric direct install spillover savings per unit based on deemed savings values; however, therm savings per spillover measure installed were based on custom

<sup>21</sup> NTGR = 1-FR+SO

<sup>22</sup> The GPY2/EPY5 full participant spillover findings were used to update GPY1/EPY4 research findings to better reflect current program conditions and because the survey sample size was larger in GPY2/EPY5.



calculations of actual therm savings using participant-specific data from the tracking database. Since weatherization measure savings are not deemed per unit like direct install measures, weatherization savings for air sealing, wall insulation, attic insulation, and other insulation were all given respective average savings per participant installation based on program tracking system data.

Total survey participant direct install and weatherization spillover savings estimated using the methods above were then averaged per survey participant (104 full, 68 assessment-only) and applied to the entire participant populations of 825 full and 2,030 assessment-only customers. The resulting full and assessment-only participant spillover savings were divided respectively by total full and assessment-only participant program savings to establish direct install, weatherization, and overall program spillover estimates

### *Considerations and Measure-Specific Adjustments to Spillover*

The evaluation team applied the following measure-specific adjustments to spillover reflecting the approach used in GPY1/EPY4 full participant research.

#### *Compact Fluorescent Bulbs*

The impact credit granted for CFL spillover adoptions must avoid double counting impact credit accrued already through the ComEd midstream residential lighting program. We continue to use the approach used in the GPY1/EPY4 evaluation that assumes that 1) the market share of program bulbs is not a readily available number, and 2) the residential lighting program EPY3 evaluation results indicated a substantial amount of free ridership (41%), and there is no reason that one program's free ridership cannot be another program's net impact. Thus, it is not necessary that bulbs be un-incented for them to legitimately qualify for credit under the HES Program.<sup>23</sup> Due to the uncertainty in this area, we take the conservative approach used in the PY3 evaluation and assume that only 50% of the impact arising from CFL spillover adoptions is creditable to the program. Again, even if these customers purchased a discounted bulb, the purchase decision was either influenced by both programs (making the 50% assumption reasonable) or influenced by only the HES program (making the 50% assumption conservative).

#### *Pipe Insulation, Insulation, and Air Sealing*

In the case of pipe insulation, the ex-ante impact is based on the installation of up to nine linear feet. Customers that report the installation of additional pipe insulation up to a total of nine linear feet outside of the program and that give the program an influence score of 8 or more qualified as spillover. Similarly, participants in the HES program that reported spillover adoptions of insulation and air sealing measures were credited an impact equivalent to the average verified impact over all the participants as a fraction of the total participant sample's savings for the particular measure.

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<sup>23</sup> There is some available evidence regarding the CFL market share of residential lighting program bulbs. The PY3 residential lighting general population survey revealed that 87% of CFLs are purchased at stores participating in the ComEd lighting program. Among program stores, the shelf space dedicated to ComEd program CFL bulbs is 53% of the overall shelf space dedicated to CFLs (for standard bulbs), and 62% for specialty bulbs. If we assume shelf space relates directly to sales share, than 46% of standard CFLs and 54% of specialty bulbs are Residential Lighting program bulbs.

Full-participant Spillover Findings

The evaluation team’s full participant spillover findings are presented in Table 4-5.

**Table 4-5. Full Participant GPY2/EPY5 Spillover Results**

	Gas	Electric
Direct Install	0%	2%
Weatherization	2%	1%
Overall	2%	1%

Source: Navigant analysis of GPY2/EPY5 Full Participant Survey

Most full participant spillover savings for direct install measures came from additional CFLs that were installed after the program. Weatherization measure spillover mostly came from individuals that reported installing the measure outside of the program was cheaper for them for the particular measure (potentially self-installs) or that the program could not do a certain installation due to space accessibility issues or other constraints.

Assessment-only Spillover Findings

The evaluation team’s assessment-only participant spillover findings are presented in Table 4-6.

**Table 4-6. Assessment-only Spillover Results**

	Gas	Electric
Direct Install	1%	1%
Weatherization	13%	6%
Overall	9%	6%

Source: Navigant analysis of GPY2/EPY5 Assessment-only Survey

Section 5.2.4 includes a discussion of assessment-only spillover process findings.

**4.2.3 Overall Research NTGR: Combining Full-Participant, Assessment-only, and TA NTGR Research**

The evaluation team consolidated GPY1/EPY4 full-participant, GPY2/EPY5 assessment-only, and GPY2/EPY5 TA NTGR research to establish overall gas and electric NTGR results for the program. Since TA NTGR feedback was for weatherization measures only (TAs were not involved with the assessments where DI measures were installed), the evaluation team needed to separate NTGR calculations between direct install and weatherization measures for all respondent types before combining results into an overall program NTGR.

**Table 4-7. Full and Assessment-only Direct Install FR, SO, and NTGR Results**

Direct Install	Gas			Electric		
	FR	SO	NTGR	FR	SO	NTGR
Full-participant (GPY1/EPY4 FR, GPY2/EPY5 SO)	0.08	0.00	0.93	0.23	0.02	0.79
Assessment-only Participant*	0.08*	0.01	0.93	0.23*	0.01	0.78
Combined SO (Full and Assessment-only)		0.01		-	0.03	-

Source: Navigant analysis of GPY1/EPY4 and GPY2/EPY5 full-participant and GPY2/EPY5 assessment-only participant surveys

\*Evaluation team adopted full participant direct install FR for assessment-only participants since no separate FR research was conducted

**Table 4-8. Full, Assessment-only, and TA Weatherization FR, SO, and NTGR Results**

Weatherization	Gas			Electric		
	FR	SO	NTGR	FR	SO	NTGR
Full-participant (GPY1/EPY4 FR, GPY2/EPY5 SO)	0.18	0.02	0.84	0.17	0.006	0.86
Assessment-only Participant	NA	0.13	NA	NA	0.057	NA
Combined SO (Full and Assessment-only)		0.15		-	0.06	-
TA	0.07	0.05	0.98	0.07	0.05	0.98

Source: Navigant analysis of GPY1/EPY4 and GPY2/EPY5 full-participant, GPY2/EPY5 assessment-only participant surveys, and GPY2/EPY5 trade ally interviews

Navigant assigned a 75% weighting to TA FR feedback and 25% to participants. Navigant assigned a greater weight to trade ally free ridership feedback because the evaluation team believes trade allies are more aware of the effects of the program on the weatherization market than participants. Navigant believes participants are less able to determine the effects of the program on their participation if the program did not exist than trade allies with experience in the market.

**Table 4-9. TA and Participant FR Weights**

FR Results Weighting	
TA Weighting	75%
Participants Weighting	25%

The evaluation team used full-participant direct install free ridership research findings and full-participant and assessment-only direct install spillover results to determine a direct install NTGR. For weatherization measures, the evaluation team weighed the trade ally and full-participant free ridership findings before applying the combined full-participant, assessment-only, and trade ally spillover results. Trade ally spillover results were treated cumulatively with participants because trade ally spillover research gauged business volume increases that may have been due to the program that did not go through the program while participant spillover gauged the installation of additional measures outside of the program. The evaluation team does not believe there is overlap between participant and trade ally spillover, since program trade allies would foreseeably direct customers to the program.

**Table 4-10. Direct Install and Weatherization Consolidated FR, SO, NTGR**

	Gas			Electric		
	FR	SO	NTGR	FR	SO	NTGR
Direct install (not weighted)	0.08	0.01	0.94	0.23	0.03	0.80
Weatherization (75% TA, 25% Participant FR)	0.10	0.20	1.11	0.10	0.11	1.02

Source: Navigant analysis of GPY1/EPY4 and GPY2/EPY5 full-participant, GPY2/EPY5 assessment-only participant surveys, and GPY2/EPY5 trade ally interviews

The evaluation team applied the respective direct install and weatherization NTGRs to GPY2/EPY5 direct install and weatherization gross savings to establish research verified net savings that were then summed and compared against the overall program verified gross savings to determine an overall program consolidated research findings NTGR for gas and electric savings. In Table 4-11 Navigant presents the overall program consolidated research findings NTGR for gas and electric savings.

**Table 4-11. Overall GPY2/EPY5 Program Research Findings NTGR (Participant and TA Research Findings Consolidated)<sup>24</sup>**

	Gas	Electric
FR	9%	20%
SO	14%	5%
<b>NTGR</b>	<b>1.05</b>	<b>0.85</b>

Source: Navigant analysis of GPY1/EPY4 and GPY2/EPY5 full-participant, GPY2/EPY5 assessment-only participant surveys, and GPY2/EPY5 trade ally interviews

<sup>24</sup> For comparative purposes, the GPY1/EPY4 NTGRs, determined using only full participant surveys, were 0.86 for gas and 0.82 for electric. Integrating assessment-only and trade ally spillover research has resulted in higher NTGR values.

## 5. Process Evaluation

The following sections summarize findings for Navigant’s post-assessment QAQC verification ride-alongs and key researchable process questions. Navigant determined the following findings and recommendations:

### QAQC Verification Ride-alongs

#### Measure QAQC

**Finding 1.** Navigant determined that contractor weatherization work and measures were sufficiently QAQC checked according to and as defined by the program manual. However, direct install measure installation verification was less consistent and not a priority during the QAQC visit.

**Recommendation.** Navigant recommends the program manual clearly state when Direct Install (DI) measure installations should be verified. Navigant believes that DI measure verification should occur during all assessment and weatherization work QAQC inspections since these inspections are already sampled from the larger participant population and need no further sub-sampling.

#### DI Measure Verification Tracking

**Finding 2.** It appears that given the short time-frame for the QAQC visit, staff may not have enough time to fill out all QAQC forms; as a result, they may be skipping certain sections, such as DI measure verification. Without thorough documentation procedures in place for verifying DI measure installations and noting discrepancies, the program may miss out on opportunities to identify error trends that can be improved upon.

**Recommendation.** Navigant recommends revamping the forms so that they are easy to fill out, trimmed down to just the essentials, and prioritized with the most important QAQC items first. This may help promote QAQC check consistency. In addition, Navigant recommends having post-installation QAQC assessors review DI measures against a project-specific checklist that is printed and brought on site during QAQC assessment so that the assessors do not rely on memory when reviewing DI measures. Finally, the program may benefit from emphasizing that QAQC staff track discrepancies such as installation errors and opportunities for education on appropriate forms.

#### Programmable Thermostat Education

**Finding 3.** Navigant’s low GPY1/EPY4 and GPY2/EPY5 survey installation rate findings for programmable thermostat education measures (about 30%) were in part supported by discussions with QAQC staff. Navigant found that QAQC staff (one of which reported being an assessor as well) may not properly understand how and when to implement the programmable thermostat education measure as intended by the program.

**Recommendation.** Navigant recommends CSG review assessor installation practices for the programmable thermostat education measure to ensure assessors have a clear understanding of how and when to implement the measure.

## Program Participation

### Assessment Pricing

**Finding 1.** Nine months of GPY2/EPY5 data suggest that promoting the HES program with a \$49 (participant) assessment cost is a cost-effective way to bring participants into the HES program.

**Recommendation.** Navigant recommends that Nicor Gas and ComEd retain the \$99 assessment pricing and selectively lower assessment pricing to \$49 to increase participation as necessary.

### Incentive Level

**Finding 2.** Navigant determined that conversion rates and average savings per household did not increase between GPY1/EPY4 and GPY2/EPY5 despite an increase in incentive levels from \$1,250 to \$1,750.

**Recommendation.** Navigant recommends Nicor Gas continue with the increased incentive level with the expectation that these incentives with the improvements described below will increase conversion and lead to deeper savings per participant.

### Full Participation Barriers

**Finding 3.** Higher than expected participation led to assessor staffing challenges in GPY2/EPY5. This may have created a barrier to participation by 1) preventing assessors from taking adequate time to explain the full participation process during the assessment, and 2) being backlogged in scheduling assessments and weatherization/contractor assignments.

**Recommendation.** It appears that planning enough time for assessors to explain and promote the weatherization phase during the assessment is a key program process for encouraging higher conversion rates.

**Finding 4.** Though the program generally rated high in satisfaction, the lowest satisfaction score for both full participants and assessment-only participants was “the time it took to schedule the Home Energy Savings program assessment.” Some assessment-only participants may have been deterred from full participation due to scheduling and follow-up issues. While CSG added assessors to reduce participant wait times, wait times still remained high and pressure on the assessors to complete assessments appears likely to have impacts on program conversion rates.

**Recommendation.** Navigant recommends addressing any aspects of program processes that may be causing assessment scheduling, post-assessment application processing, or weatherization contractor assignment delays. Ensuring sufficient assessor staffing levels may help alleviate assessment scheduling delays. Navigant recommends that CSG allow the number of assessors to increase or decrease as needed according to participation demand. In addition, the program may increase conversion rates by ensuring proper during-assessment weatherization support and by conducting post-assessment follow-up communications to maintain participant interest in the program and to ensure their understanding of participation procedures.

### EI2 House Party Outreach

**Finding 4.** EI2 house party participants accounted for 13% of participants, about 10% of program savings, and participants were generally more satisfied with the program and understood the participation process and program offerings better than Non-EI2 house

party participants. On the other hand, EI2 house party participant conversion rates were considerably lower than non-participant rates.

**Recommendation.** With EI2’s withdrawal from the program, Navigant recommends CSG assess the benefits and costs of replicating key components of the house party outreach model and identifying other ways of leveraging community-based outreach approaches.

## 5.1 QAQC Verification Ride-along Results

Navigant conducted two QAQC ride-alongs with two CSG QAQC staff (a new assessor and an experienced assessor) in order to verify program post-assessment QAQC practices. Field observations were compared against the program operation manual protocols for QAQC practices to identify potential discrepancies.

### 5.1.1 Measure QAQC

Navigant determined that contractor weatherization work and measures were sufficiently QAQC checked according to and as defined by the program manual. However, direct install measure installation verification was less consistent and not a priority during the QAQC visit. Navigant verified practices outlined in the program operations manual and found that there appears to be ambiguity in the manual as to when Direct Install (DI) measures should be checked. The program manual defines two QAQC types: a QAQC of assessor work and a QAQC of weatherization contractor work. According to the program manual, the assessment QAQC, which emphasizes review of home assessment procedures and verification of direct install measure installation, should either be done as a ride-along with new assessors or as part of contractor weatherization work QAQC. However, the program manual section outlining the contractor QAQC procedures does not outline direct install measure verification as a priority. As a result, it is not clear when a contractor QAQC is defined as one where assessment work including DI measures should be reviewed in addition to contractor work verification procedures. As such, DI measure verification appears to not be strongly and clearly emphasized in the post-installation (contractor) QAQC effort both in the program manual and as observed in Navigant’s ride-alongs.

### 5.1.2 DI Measure Verification Tracking

It appears that given the short time-frame for the QAQC visit, staff may not have enough time to fill out all parts of QAQC forms; as a result, they may be skipping certain sections, such as DI measure verification. The less thorough review of DI measures was evident in Navigant’s ride-alongs with post-installation (contractor) QAQCs, which resulted in potential lost opportunities for program improvement. QAQC staff relied on memory to recall what DI measures were installed in the particular home, and one assessor reported that they do not always check for DI measures. One of the assessors made notes on DI measures, while the other did not during the assessment (but may have in the car after the assessment).

Both assessors found pipe insulation DI measure errors.<sup>25</sup> The first did not seem to make note of it on a form, while the other intended to fix the error before the end of the inspection, but given the other

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<sup>25</sup> In the first pipe insulation error, the assessor found that the pipe insulation was installed on the wrong portion of the pipe which made the insulation less effective- it wasn’t installed on the first nine feet of pipe. In the second pipe insulation error, the assessor found that the pipe insulation was installed too close to the flue- it should not be within six inches of the flue.



priorities, he forgot and Navigant staff did not see him take note of the error on the forms. These are both examples of the potential for making program improvements that can be lost due to some inconsistencies in defining DI measure verification procedures.

### 5.1.3 Programmable Thermostat Education

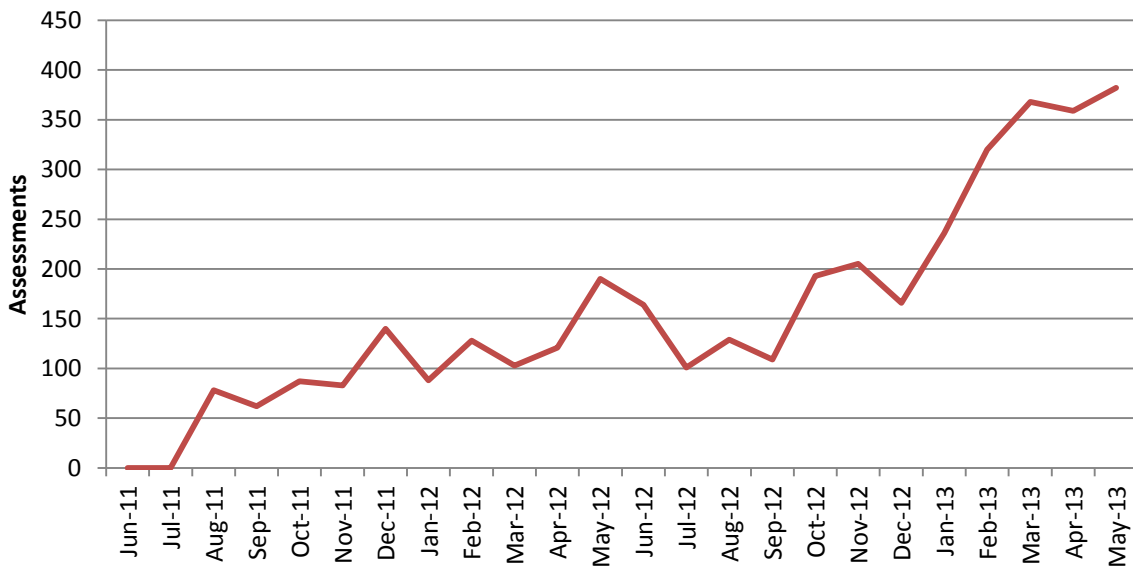
Navigant’s low GPY1/EPY4 and GPY2/EPY5 survey installation rate findings for programmable thermostat education measures (about 30%) were in part supported by discussions with QAQC staff. Navigant found that QAQC staff (one of which reported being an assessor as well) may not properly understand how and when to implement the programmable thermostat education measure as intended by the program. QAQC staff reported that they do not conduct programmable thermostat education measures unless they are installing a programmable thermostat as well- whereas the education measure is intended for existing programmable thermostats. They explained that they wouldn’t want to program an existing programmable thermostat for liability reasons and because of time constraints. One QAQC staff personnel also noted that customer engagement varies, which affects their ability to implement the measure as well. Thus, there appears to be potential for misunderstanding for assessors as to when and how to conduct the measure, as the measure is intended to be done on homes with an existing programmable thermostat. Navigant recommends CSG review assessor installation practices for the programmable thermostat measure to ensure assessors have a clear understanding of how and when to implement the measure.

## 5.2 Program Participation

Navigant conducted full participant and assessment-only participant surveys in addition to trade ally in-depth interviews and a tracking system data analysis to answer key researchable process questions.

Navigant compared monthly assessment and conversion rate data between GPY1/EPY4 and GPY2/EPY5 to identify trends between the two years. Figure 5-1 below shows that the number of assessments per month has generally increased since GPY1/EPY4.

**Figure 5-1. Assessments per Month GPY1/EPY4 through GPY2/EPY5**

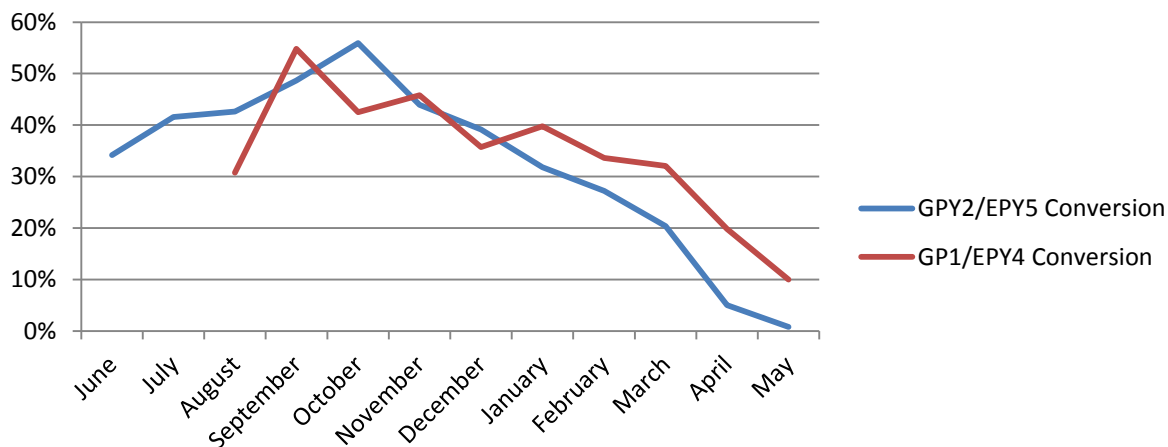


Source: Navigant Analysis of GPY1/EPY4 and GPY2/EPY5 tracking data



Navigant also compared conversion rates between program years. Conversion rates were assigned to the month of the assessment conducted, so if an assessment was conducted in January, and that project’s weatherization work was conducted in February, the conversion is attributed to the month of January. Figure 5-2 below shows that conversion rates have generally followed a trend over the last two program years, despite a three month period in GPY2/EPY5 when assessment prices were reduced to \$49 from \$99. The data shows that conversion rates are highest in the late summer and early fall and steadily decrease through the program year. Figure 5-2 also shows that though the program had similar conversion rates per month in GPY2/EPY5 as in GPY1/EPY4 through January, the program began to have lower conversion rates after December during GPY2/EPY5 than in the same time period in GPY1/EPY4. Note that the fourth quarter results for each program year do not capture assessment participants that will have received weatherization work in the following program year. As a result, the conversion rates for the fourth quarter appear lower due to available data than they are in practice.

**Figure 5-2. Comparison of Conversion Rates by Month between GPY1/EPY4 and GPY2/EPY5**



Source: Navigant Analysis of GPY1/EPY4 and GPY2/EPY5 tracking data

### 5.2.1 Assessment Price, Conversion Rates, and Measure Installations

The HES program reduced assessment prices to \$49 from \$99 for 201 participants between the months of June and August, 2012. Navigant reviewed tracking system data to compare incentive cost per unit of energy saved between \$99 and \$49 assessment participants to determine which pricing is more cost effective. The analysis included only incentive costs - both utility and EI2 contributions - and the program management fee associated with the conversions, both of which were pulled from the tracking system extract.<sup>26</sup> Navigant allocated EI2 incentive funding to total Nicor and ComEd costs based on their comparative MMBTU savings ratio.<sup>27</sup> Navigant’s analysis excludes fourth quarter

<sup>26</sup> All analyses and utility-specific costs assume the current cost allocation between ComEd and Nicor Gas as reflected in the tracking system data.

<sup>27</sup> Since EI2 contributed money to weatherization incentives, their involvement had an effect on the program that cannot be ignored.

assessment participants because their conversions would not all have occurred in the program year. Two snapshots of the cost findings are presented:

- Nine months GPY2/EPY5 showing EI2 contributions separately
- Direct Install (DI) and weatherization-specific results for nine months of GPY2/EPY5

Navigant's analysis of nine months of GPY2/EPY5 data excluding fourth quarter assessment participants yielded the results in Table 5-1.

In total, the participant \$49 assessments appear more cost effective for both utilities (looking at tracking data costs only), while the \$99 assessment delivers higher conversion rates and higher per participant savings. Higher \$99 conversion rates and the resulting greater weatherization incentive costs more than offset the lower cost to the utility of the \$99 assessment.

Looking separately at direct install and weatherization costs per therm saved, the assessment and direct install measures cost less per unit saved for \$49 assessments relative to \$99 assessments, while weatherization measures cost more (see Table 5-2).

**Table 5-1. Nine Months GPY2/EPY5 Overall Assessment Cost Comparison**

		Nine Months GPY2/EPY5 Overall		
		\$99	\$49	% Diff
<b>Participation</b>	Participation (Assess-only and Full P)	1419	201	
	Full Participants	571	60	
	Assessment-only	848	141	
	Conversion Rate*	40%	30%	
<b>Costs**</b>	Nicor Cost	\$840,386	\$ 104,392	
	ComEd Cost	\$180,236	\$24,136	
	EI2 Cost	\$234,789	\$12,645	
	EI2 Cost Nicor Allocation	\$209,463	\$11,155	
	EI2 Cost ComEd Allocation	\$25,326	\$1,490	
	Total Nicor Cost (Nicor + EI2 Allocation)	\$1,049,849	\$115,548	
	Total ComEd Cost (ComEd + EI2	\$205,562	\$25,626	
	Total Cost**	\$1,255,411.65	\$141,173.43	
<b>Savings</b>	Therms Saved	179,067	21,617	
	kWh Saved	634,916	84,661	
	MMBTU Nicor	17,906.72	2,161.74	
	MMBTU ComEd	2,165.07	288.69	
	Therms Saved per Participant	126.19	107.55	-15%
	kWh Saved per Participant	447.44	421.20	-6%
<b>Costs per Unit of Energy Saved</b>	<b>Nicor \$/Therm</b>	<b>\$4.69</b>	<b>\$4.83</b>	<b>3%</b>
	<b>ComEd \$/kWh</b>	<b>\$ 0.28</b>	<b>\$0.29</b>	<b>0%</b>
	EI2 \$/Therm	\$1.17	\$0.52	-56%
	EI2 \$/kWh	\$0.04	\$0.02	-56%
	<b>Nicor \$/Therm with EI2 Allocation</b>	<b>\$5.86</b>	<b>\$5.35</b>	<b>-9%</b>
	<b>ComEd \$/kWh with EI2 Allocation</b>	<b>\$0.32</b>	<b>\$0.30</b>	<b>-7%</b>

Source: Navigant Analysis of GPY2/EPY5 tracking data.

\*Overall \$99 conversion rate includes some \$99 assessments that occurred during the \$49 assessment promotion period

\*\*Incentives and Program Management Fee

**Table 5-2. Nine Months GPY2/EPY5 DI and Weatherization by Assessment Cost Comparison**

		Nine Months GPY2/EPY5 DI and Weatherization		
		\$99	\$49	% Diff
<b>Incentive Costs</b>	DI and Assess Measure Cost Nicor	\$172,144	\$ 32,078	
	DI and Assess Measure Cost ComEd	\$62,311	\$11,375	
	DI and Assess Measure Cost EI2	\$-	\$-	
	Weath Measure Cost Nicor	\$668,242	\$72,314	
	Weath Measure Cost ComEd	\$117,925	\$12,761	
	Weath Measure Cost EI2	\$234,789	\$12,645	
	Nicor EI2 Allocation Ratio	0.89	0.88	
	ComEd EI2 Allocation Ratio	0.11	0.12	
	Weath Measure Cost Nicor with EI2 allocation	\$877,706	\$83,469	
	Weath Measure Cost ComEd with EI2 allocation	\$143,251	\$14,251	
	Total DI + Weatherization Cost	\$1,255,412	\$141,173	
	Total Full Participant Costs	\$1,115,166	110,886	
<b>Savings</b>	DI Measure Savings therms	51,480	8,530	
	DI Measure Savings kwh	438,948	61,387	
	Weath Measure Savings therms	127,588	13,088	
	Weath Measure Savings kwh	195,968	23,274	
	Overall Savings therms	179,067	21,617	
	Overall Savings kWh	634,916	84,661	
	Total Therm Savings DI + Weatherization	179,067	21,617	
	Total kWh Savings DI + Weatherization	634,916	84,661	
	Total Full Participant Savings therms	148,208	16,048	
	Total Full Participant Savings kWh	369,644	41,103	
	DI Participants	1,419	201	
	Avg DI Savings/DI Participant therms	36	42	17%
	Avg DI Savings/DI Participant kWh	309	305	-1%
	Total/Full Participants	1,419/571	201/60	
	<b>Avg W Savings/Total and Full Participants - therms</b>	<b>90/223</b>	<b>65/218</b>	<b>-28%/-2%</b>
	<b>Avg W Savings/Total and Full Participants - kWh</b>	<b>138/343</b>	<b>116/388</b>	<b>-16%/13%</b>
	<b>Costs per Unit of Energy Saved</b>	<b>DI + Assess \$/DI Therm Savings</b>	<b>\$3.34</b>	<b>\$3.76</b>
<b>DI + Assess \$/DI kWh Savings</b>		<b>\$0.14</b>	<b>\$ 0.19</b>	<b>31%</b>
<b>Weath \$/Weath Therm Savings</b>		<b>\$6.88</b>	<b>\$6.38</b>	<b>-7%</b>
<b>Weath \$/Weath kWh Savings</b>		<b>\$ 0.73</b>	<b>0.61</b>	<b>-16%</b>

Source: Navigant Analysis of GPY2/EPY5 tracking data.

It must be kept in mind that the data are not definitive and repeating and expanding this analysis may make sense once the program marketing and operations are largely stable. Navigant identified the following causes for uncertainty with the data:

- The data reflect only incentive costs and program management fees and do not include full marketing and implementation costs
- The program was ramping up its delivery and marketing capabilities during this period so other factors than the assessment cost may have influenced the conversion rate differences
- The \$49 assessment offering occurred during the summer only, a traditionally low period for this program. Consequently the \$49 results could be unrepresentative of year-round results
- EI2 house parties were active during this period and will not necessarily be active going forward

With the above in mind, the available nine months of data suggest that promoting the HES program with a \$49 (participant) cost is a cost-effective way to bring participants into the HES program. Promoting the program with a \$49 assessment offering could yield additional savings at lower cost than the \$99 price but deliver fewer conversions with their deeper savings.

### 5.2.2 Incentive Levels, Conversion Rates, and Measure Installations

The program increased incentives of 50% (up to \$1,250 per home) of weatherization costs in GPY1/EPY4 to 70% (up to \$1,750 per home) in GPY2/EPY5. By comparing program-year-level data in the GPY1/EPY4 and GPY2/EPY5 tracking databases, Navigant found that the GPY2/EPY5 conversion rate was 26% compared to 29% in GPY1/EPY4.<sup>28</sup>

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<sup>28</sup> The 95 GPY1/EPY4 audit participants that received weatherization work in GPY2/EPY5 were not included in the total full participants in GPY2/EPY5 for calculating conversion rates across the program year, since GPY2/EPY5 participants that will receive weatherization work in GPY3/EPY6 are not captured yet either. The reported conversion rates are approximate. Once GPY2/EPY5 audit participants that receive weatherization work in GPY3/EPY6 will be factored in, the GPY2/EPY5 conversion rate will increase. For example, the GPY1/EPY4 conversion rate increases to 38% when the 95 GPY1/EPY4 participants that received weatherization work in GPY2/EPY5 are included in the full participant count for GPY1/EPY4. The latter adjustment to GPY1/EPY4 conversion rates could be done once GPY2/EPY5 data became available during GPY3/EPY6. The same will be done for GPY2/EPY5 once GPY3/EPY6 data becomes available, allowing the evaluation team to identify which GPY2/EPY5 audit participants ultimately received weatherization work in GPY3/EPY6.

**Table 5-3. Conversion Rate and Savings Comparison GPY1/EPY4 and GPY2/EPY5**

	GPY1/EPY4	GPY2/EPY5
Total Assessment-only and Full-Participants	1,080	2,760
Total Full Participants	315	730
Conversion Rate	29%	26%
Avg kWh Savings/Household	536	406
Avg therm Savings/Household	102	99
kWh % Difference GPY2/EPY5 vs GPY1/EPY4		-24%*
Therms % Difference GPY2/EPY5 vs GPY1/EPY4		-2%

*Source: Navigant analysis of GPY1/EPY4 and GPY2/EPY5 tracking data.*

*\*The decrease in electric savings may be attributed to changes in the CFL baseline wattage between GPY1/EPY4 and GPY2/EPY5 as well as there being no electric programmable thermostat heaters in GPY2/EPY5 compared to GPY1/EPY4.*

The above results in Table 5-3 show that annual conversion rates and average savings per household did not increase between GPY1/EPY4 and GPY2/EPY5 despite an increase in incentive levels from \$1250 to \$1750. One factor for the lack of increase in conversion rates despite an increase in the incentive offerings may be due to assessment and weatherization job scheduling delays that may have occurred as a result of higher than planned participation in GPY2/EPY5. Though the conversion rate is lower in GPY2/EPY5 than GPY1/EPY4, the number of assessment participants in GPY2/EPY5 nearly tripled.

During interviews, CSG noted that program volume increased in the fourth quarter of 2012 which resulted in an assessment backlog of more than three to five weeks. The resulting demand on assessors' time may have resulted in less thorough assessments where assessors may have had less time to devote to the customer, making sure they understand the assessment reports, and helping to convince them to participate in weatherization work. Notably, one contractor cited a lack of assessor focus on promoting projects rather than focusing on achieving a target number of assessments done per month as a barrier to customer weatherization participation. The contractor felt the assessors were not spending enough time with customers to educate and otherwise prime them to undertake the project. This contractor's sentiment was paralleled in participant survey result findings described below.

Contractors further cited delays between the assessment and weatherization work without sufficient follow-up to encourage home owners to follow-through with work as potential barriers that may have depressed conversion rates. Contractors interviewed noted that, although the price point is the primary determinant of weatherization participation, timing is an additional important factor. One contractor said customers are more likely to pursue projects if the program can minimize the time between when the program gets introduced to the customer and when the assessment is done, and then the time to when the project is scheduled.

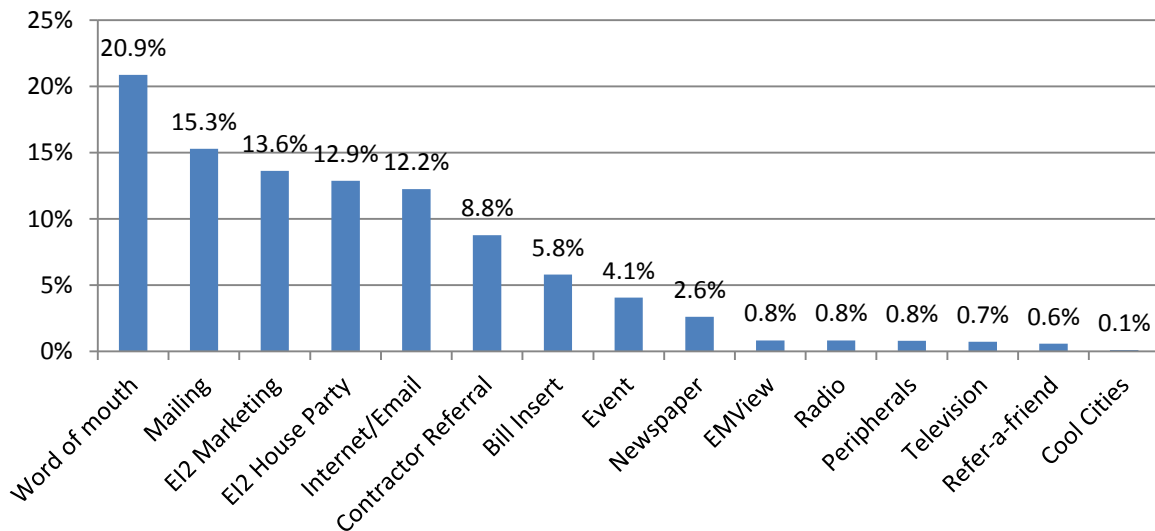
Navigant notes similar assessment timing and quality sentiment trends in the full and assessment-only participant feedback in section 5.2.4 below. Assessment-only participants noted that the greatest sources of dissatisfaction with the program were that the program was not helpful, that there were

scheduling issues (including lack of prompt follow-up after assessment), and insufficient program information and understanding despite the home assessment.

### 5.2.3 EI2 House Party Outreach Model Analysis

According to CSG tracking data, EI2 house parties accounted for about one-tenth of total program participation referrals (13%), which, along with Internet referrals, made it the fourth most common referral source after EI2 marketing, program mailers, and word of mouth. Furthermore, EI2 house parties accounted for about 8% of full participant participation and 10% of both electric and gas total savings.

**Figure 5-3. Total Program Referral Sources (n=2,760)**



Source: Navigant analysis of GPY2/EPY5 tracking data.

### EI2 Conversion Rates

Navigant reviewed the EI2 referral conversion rate against Non-EI2 referral participants. The EI2 conversion rate was 19% compared to 31% for Non-EI2 participants. According to Navigant’s survey data comparing EI2 against Non-EI2 full participants, EI2 participants reported being more likely to have done major changes to their home to save energy than the average participant prior to learning about the program. Two-thirds of EI2 full participants also reported having been hosts of a house party as well. Another potential reason for the lower EI2 conversion rate may have to do with the nature of the event, where some house party attendees may be friends and family that attend the event and get an assessment more out of curiosity rather than prior intention of having weatherization work done on their home.

**Table 5-4. EI2 vs. Non-EI2 Participation and Savings<sup>29</sup>**

	EI2	Non-EI2
Total Participants	355	2405
Total Full Participants	68	757
Conversion Rate	19%	31%
Total kWh Savings	112,808	1,007,989
Total Therm Savings	25,912	247,988
Avg kWh/Household	318	419
Avg therm/Household	73	103

Source: Navigant analysis of GPY2/EPY5 tracking data.

### EI2 Model Strengths

Navigant used full participant survey data (n=104) and trade ally interviews (n=5) to better understand EI2 house party outreach strengths. According to Navigant’s survey data, more EI2 full participants generally gave program process scores a rating of seven or higher on a ten-point scale than non-EI2 participants (see Table 5-5). The biggest difference in scoring distributions between EI2 and non-EI2 participants was for the “information received about the program” category, where 100% of EI2 participants rated it a seven or higher compared to 91% of non-EI2 participants.

**Table 5-5. Non-EI2 vs EI2 Program Process Satisfaction Scores**

Category	% of Non-EI2 Ratings 7+	% of EI2 Ratings 7+
Program sign up process	91%	97%
The instant rebate	94%	97%
Measures received	87%	93%
Time it took to schedule an assessment	87%	89%
Time it took to schedule the insulation work	84%	83%
The representative that visited to conduct the assessment	93%	94%
Contractor who installed weatherization upgrades	93%	97%
Info received about the program	91%	100%
The House Party program informational session	NA	100%
The Home Energy Savings program overall	94%	100%

Source: Navigant analysis of survey data.

<sup>29</sup> Non-EI2 full participants and savings values include 95 GPY1/EPY4 audit participants that received weatherization work in GPY2/EPY5.



Contractors interviewed had a number of observations and opinions about the EI2 informational parties. A key strength of the informational parties, one contractor noted, was having an independent third party hosting and conducting the party so that the contractor was presenting on behalf of the program as a participating contractor. This resulted in a “no-pressure” approach for prospective customers to size up the program without feeling they are getting a biased sales pitch. One contractor who is a proponent of the house party outreach method has noticed that the independent third party setting ending with the end of the EI2-supported house party outreach method is causing prospective customers to have a more guarded interest in the program. Another trade ally noted that a challenge with the house party outreach method is that some people schedule parties and then cancel them. Nonetheless, the same respondent said that when they actually get a house party they get an average of two to three job referrals per house party.

Considering that EI2 house party attendees accounted for 13% of program participants and about 10% of electric and gas savings, discontinuing the EI2 program could risk a substantial amount of future program savings. A simple way to maintain the benefits provided by EI2 house parties (principally, a productive channel with thorough program information) can be to continue to host house parties, leveraging EI2’s methods and materials. The program could also benefit from promotion through relevant community networks.<sup>30</sup> For example, NSTAR Electric Company (NSTAR) notes in their 2009-2012 three year evaluation plan that a successful community outreach model involves understanding and addressing the unique needs of partner communities to achieve cost-effective energy savings. NSTAR sought to promote through

*“... community-based organizations that have long-standing relationships with homeowners, tenants and small businesses in economically marginalized communities and other groups that have a strong record of clean energy education and outreach, [to] develop a ‘community mobilization outreach model’ that implements a large-scale bundled neighborhood approach to energy efficiency retrofitting.”*

NSTAR chose community organizations to promote their programs based on 1) their existing and long-standing ties with potential participants in the program and/or 2) their strong record of clean energy education and outreach.

Properly selecting communities for community-based outreach is important as well. NSTAR program administrators selected communities with the greatest opportunities for success because community-based efforts require a substantial and focused effort by both the program administrator and the community. Then the utility and program administrator partnered with community-based organizations (chosen based on the criteria noted above) in those communities to develop outreach

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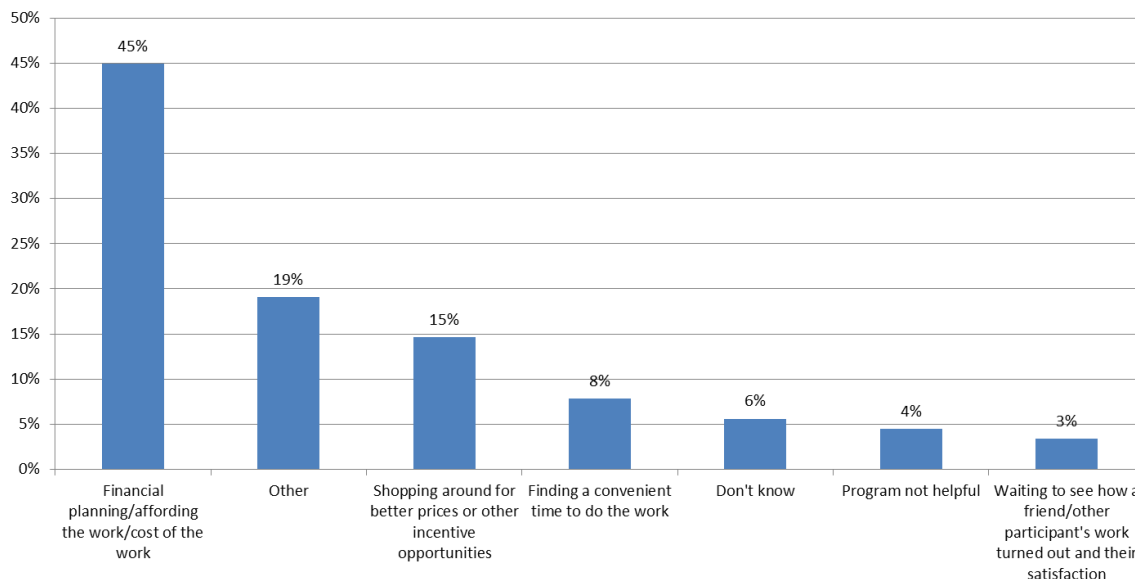
<sup>30</sup> Navigant conducted a literature review to identify examples of community outreach at other utilities. The evaluation team found that NSTAR Electric Company (NSTAR) in Massachusetts had particularly successful community-based outreach efforts. NSTAR conducted community-based pilots designed to test a number of partnerships in 2011 between the Program Administrators and local communities to achieve broader participation in audit and weatherization type energy efficiency programs. Program outreach was conducted by local community groups and measures were installed through the company’s existing vendors. According to NSTAR’s evaluation report (NSTAR Electric 2011 Energy Efficiency Annual Report, pg. 47), while the overall results and successes of these outreach activities varied by community, the utility determined that community outreach is an important component to enhancing the company’s ability to achieve greater program participation and energy savings. The HES program may benefit from more actively leveraging community groups to help promote the program, including promoting informational house parties.

and program delivery strategies. In partnering with community organizations, the utility and program administrator sought to educate the organizations about the energy efficiency services delivery process and learn about the interests and skill sets of the community-based groups with respect to potentially delivering agreed-upon program components in selected communities.<sup>31</sup>

#### 5.2.4 Barriers to Full Participation and Assessment-only “Do-It-Yourself” Spillover

The evaluation team reviewed assessment-only survey results to identify barriers to full participation. The primary reason assessment-only participants gave for not completing the recommended weatherization work was “Financial planning/affording the work/cost of the work” (45% of responses, n=89). Other top reasons included shopping around for better prices or other incentive opportunities, and finding a convenient time to do the work.

**Figure 5-4. Assessment-Only Weatherization Participation Barriers**



Source: Navigant analysis of survey data.

Assessment-only participants further noted that the greatest sources of dissatisfaction with the program were that the program was not helpful, that there were scheduling issues (including lack of prompt follow-up after assessment), and insufficient program information and understanding despite the home assessment. As noted previously, contractors similarly cited financial concerns and timing as top barriers to participation. Contractors noted long wait times for scheduling weatherization work without sufficient follow-up to encourage home owners to follow-through with work. One contractor notes that projects have a better chance of being done if the program can minimize the time between when the program gets introduced to the customer and when the assessment is done, and then the time to when the project is scheduled (see Appendix 7.3 for detailed trade ally interview findings).

<sup>31</sup> See Massachusetts Joint Statewide Three-Year Electric Energy Efficiency Plan, 2010-2012, pgs. 115-118. <http://www.env.state.ma.us/dpu/docs/electric/09-120/11209nstptl.pdf>

Assessment-only participant suggestions for program improvement include providing better participation information, explaining the applicability of the program to various home types (and lack thereof), and addressing concerns over lack of information and/or comprehensiveness during the assessment.

**Assessment-only Spillover Process Findings**

Navigant found indication of do-it-yourself spillover among assessment-only participants as described in Section 4.2.2. About 22% of assessment-only participants did some form of weatherization work after the program, though not all attributed influence to the program. Of the 68 assessment-only participants that were interviewed, there was one instance of air sealing, two instances of wall insulation, two of attic insulation, and one of other insulation that were installed and eligible as program spillover (participants reported program influence scores of 8 or higher ). Of the 15% of assessment-only participants that indicated that they were “shopping around” for better incentives/deals, about 38% followed-through with insulation work outside of the program, and none of those attributed high influence to the program for doing that work.

**5.2.4.1 Full and Partial Participant Program Process Satisfaction Score Comparison**

Navigant further compared full participant and assessment-only participant survey results for program process satisfaction to identify experience differences between the two groups as well as to identify lowest scoring processes that may need attention. Generally, more full participants scored program processes a seven or above on a ten-point scale. The process that received the most low scores for both full participants and assessment-only participants was “the time it took to schedule the Home Energy Savings program assessment.” Only 60% of assessment-only participants gave it a score of seven or higher. This suggests that some assessment-only participants may have been deterred from full participation due to scheduling and follow-up issues.

**Table 5-6. Assessment-only and Full-Participant Satisfaction Average Score Comparison**

	% Assessment-only (GPY2/EPY5) Score 7+	% Full Participant Score 7+
The process to sign up for the program	73%	97%
The time it took to schedule the Home Energy Savings program assessment (energy audit)?	60%	89%
The representative that visited your home to conduct the home energy assessment (energy audit)?	81%	94%
Information you received about the program	79%	100%
The House Party program informational session you attended*	100%	100%
The Home Energy Savings program overall?	73%	100%

Source: Navigant analysis of survey data.

\*This question was asked only of survey respondents that reported attending an EI2 house party.

In sum, assessment-only participants identified finances, other potential better offers, and timing as the most important barriers in continuing to participate in the program after their home assessment. The program may benefit from establishing protocols for following-up with customers shortly after their assessments to both ensure their understanding of the program next steps and to help promote their participation in the program. Directly addressing any customer concerns over finances, convenient scheduling for weatherization work and the competitiveness of the rebates during follow-up could help promote their full participation in the program. Ensuring assessor staff have time to address these issues during assessments could prove helpful for increasing conversion rates as well.

## 6. Conclusions and Recommendations

Overall, the program performed well in GPY2/EPY5 relative to GPY1/EPY4. Assessment participation, weatherization participation, and electric savings targets were met, though therms savings goals were not. Furthermore, participants were generally satisfied with the program, though some areas for streamlining were identified. Key impact and process findings and recommendations are outlined below.

### Program Savings Achievement

**Finding 1.** The GPY2/EPY5 program set to achieve net savings of 700 MWh and 545,466 therms. Navigant reports verified gross savings of 1,121 MWh and 273,900 therms and verified net savings of 973 MWh and 235,554 therms. GPY2/EPY5 verified net gas savings do not meet the original savings goals while electric savings exceed them. However, both gas and electric gross savings achieved are in line with the implementation contractor's revised goals.

**Recommendation.** Navigant recommends adjusting program savings goals for future program years based on lessons learned in GPY2/EPY5 and the program participation and savings findings presented in this report.

### Gross Realization Rates

**Finding 2.** Navigant reports overall gross realization rates of 100% for MWh and 108% for therms.

**Recommendation.** Navigant recommends updating ex-ante calculations for kitchen and bathroom faucet aerators based on clarifications presented in the Illinois TRM version 2.0. Additionally, Navigant recommends applying programmable thermostat savings at the household level rather than per unit installed to be in line with the TRM, and to calculate ex-ante programmable thermostat education savings based on clarifications in the TRM v2.0.

### Net-to-Gross Rate

**Finding 3.** Navigant calculates overall verified net savings using SAG-deemed NTGR values of 0.87 for electric savings and 0.86 for gas savings. SAG deemed electric NTGR values on a measure-specific basis, and deemed an overall program NTGR for gas savings. The evaluation team also determined an overall research NTGR for future use of 0.85 for electric savings (0.80 Direct Install, 1.02 Weatherization) and 1.05 (0.94 Direct Install, 1.11 Weatherization) for gas savings utilizing full-participant, assessment-only participant, and trade ally research findings.

### Tracking System Review

**Finding 4.** The evaluation team found that though it is possible to identify full-participants from assessment-only participants in the tracking database judging by their measure installations, there is no unique field clearly designating full-participants from assessment-only participants.

**Recommendation.** Navigant recommends adding a field in the tracking database for participant type to distinguish full-participants from assessment-only participants. This

will help ensure proper differentiation between the two participants groups in the tracking data for analysis.

### Program Participation

**Finding 5.** The GPY2/EPY5 HES program saw participation of 2,760 total home energy assessments with weatherization jobs completed at 825 residences (these 825 weatherization jobs include 95 carry-over participants that received assessments in GPY1/EPY4). This is more than double GPY1/EPY4 participation, with an increase in total participants of 156% and an increase in weatherization jobs of 158%.

### Assessment Pricing

**Finding 6.** Nine months of GPY2/EPY5 data suggest that promoting the HES program with a \$49 (participant) assessment cost is a cost-effective way to bring participants into the HES program.

**Recommendation.** Navigant recommends that Nicor Gas and ComEd retain the \$99 assessment pricing and selectively lower assessment pricing to \$49 to increase participation as necessary.

### Incentive Level

**Finding 7.** Navigant determined that conversion rates and average savings per household did not increase between GPY1/EPY4 and GPY2/EPY5 despite an increase in incentive levels from \$1,250 to \$1,750. Other program factors in GPY2/EPY5, described below, may have depressed the conversion rate.

**Recommendation.** Navigant recommends Nicor Gas and ComEd continue with the increased incentive level with the expectation that these incentives, when combined with improvements described below will, increase conversions and lead to deeper savings per participant.

### Full Participation Barriers

**Finding 8.** Though the program generally rated high in satisfaction, the lowest satisfaction score for both full participants and assessment-only participants was “the time it took to schedule the Home Energy Savings program assessment.” Some assessment-only participants may have been deterred from full participation due to scheduling and follow-up issues. While CSG added assessors to reduce participant wait times, wait times still remained high and pressure on the assessors to complete assessments appears likely to have impacts on program conversion rates.

**Recommendation.** Navigant recommends addressing any aspects of program processes that may be causing assessment scheduling, post-assessment application processing, or weatherization contractor assignment delays. Ensuring sufficient assessor staffing levels may help alleviate assessment scheduling delays. Navigant recommends that CSG allow the number of assessors to increase or decrease as needed according to participation demand. In addition, the program may increase conversion rates by ensuring proper during-assessment weatherization support and by conducting post-assessment follow-up communications to maintain participant interest in the program and to ensure their understanding of participation procedures.

### EI2 House Party Outreach

**Finding 9.** EI2 house party participants accounted for 13% of participants, about 10% of program savings, and participants were generally more satisfied with the program and understood the participation process and program offerings better than Non-EI2 house party participants. On the other hand, EI2 house party participant conversion rates were considerably lower than non-participant rates.

**Recommendation.** With EI2's withdrawal from the program, Navigant recommends CSG assess the benefits and costs of replicating key components of the house party outreach model and identifying other ways of leveraging community-based outreach approaches.

#### **Future Evaluation Risk**

**Finding 10.** Given that GPY2/EPY5 and GPY3/EPY6 NTGR are based on GPY1/EPY4 research, Navigant has reason to believe that future NTGR research may yield notably different results given interim changes in incentive levels, assessment pricing, and/or outreach methods.

**Recommendation.** The above should be taken into consideration when planning program changes.

## 7. Appendix

### 7.1 Glossary

#### High Level Concepts

##### Program Year

- EPY1, EPY2, etc. Electric Program Year where EPY1 is June 1, 2008 through May 31, 2009, EPY2 is June 1, 2009 through May 31, 2010, etc.
- GPY1, GPY2, etc. Gas Program Year where GPY1 is June 1, 2011 through May 31, 2012, GPY2 is June 1, 2012 through May 31, 2013.

There are two main tracks for reporting impact evaluation results, called Verified Savings and Impact Evaluation Research Findings.

##### Verified Savings composed of

- Verified Gross Energy Savings
- Verified Gross Demand Savings
- Verified Net Energy Savings
- Verified Net Demand Savings

These are savings using deemed savings parameters when available and after evaluation adjustments to those parameters that are subject to retrospective adjustment for the purposes of measuring savings that will be compared to the utility's goals. Parameters that are subject to retrospective adjustment will vary by program but typically will include the quantity of measures installed. In EPY5/GPY2 the Illinois TRM was in effect and was the source of most deemed parameters. Some of ComEd's deemed parameters were defined in its filing with the ICC but the TRM takes precedence when parameters were in both documents.

**Application:** When a program has deemed parameters then the Verified Savings are to be placed in the body of the report. When it does not (e.g., Business Custom, Retrocommissioning), the evaluated impact results will be the Impact Evaluation Research Findings.

##### Impact Evaluation Research Findings composed of

- Research Findings Gross Energy Savings
- Research Findings Gross Demand Savings
- Research Findings Net Energy Savings
- Research Findings Net Demand Savings

These are savings reflecting evaluation adjustments to any of the savings parameters (when supported by research) regardless of whether the parameter is deemed for the verified savings analysis. Parameters that are adjusted will vary by program and depend on the specifics of the research that was performed during the evaluation effort.

**Application:** When a program has deemed parameters then the Impact Evaluation Research Findings are to be placed in an appendix. That Appendix (or group of appendices) should be labeled Impact Evaluation Research Findings and designated as "ER" for short. When a program does not have deemed parameters (e.g., Business Custom, Retrocommissioning), the Research Findings are to be in the body of the report as the only impact findings. (However, impact findings may be summarized in the body of the report and more detailed findings put in an appendix to make the body of the report more concise.)



## Program-Level Savings Estimates Terms

N	Term Category	Term to Be Used in Reports‡	Application†	Definition	Otherwise Known As (terms formerly used for this concept)§
1	Gross Savings	Ex-ante gross savings	Verification and Research	Savings as recorded by the program tracking system, unadjusted by realization rates, free ridership, or spillover.	Tracking system gross
2	Gross Savings	Verified gross savings	Verification	Gross program savings after applying adjustments based on evaluation findings for only those items subject to verification review for the Verification Savings analysis	Ex post gross, Evaluation adjusted gross
3	Gross Savings	Verified gross realization rate	Verification	Verified gross / tracking system gross	Realization rate
4	Gross Savings	Research Findings gross savings	Research	Gross program savings after applying adjustments based on all evaluation findings	Evaluation-adjusted ex post gross savings
5	Gross Savings	Research Findings gross realization rate	Research	Research findings gross / ex-ante gross	Realization rate
6	Gross Savings	Evaluation-Adjusted gross savings	Non-Deemed	Gross program savings after applying adjustments based on all evaluation findings	Evaluation-adjusted ex post gross savings
7	Gross Savings	Gross realization rate	Non-Deemed	Evaluation-Adjusted gross / ex-ante gross	Realization rate
1	Net Savings	Net-to-Gross Ratio (NTGR)	Verification and Research	1 – Free Ridership + Spillover	NTG, Attribution
2	Net Savings	Verified net savings	Verification	Verified gross savings times NTGR	Ex post net
3	Net Savings	Research Findings net savings	Research	Research findings gross savings times research NTGR	Ex post net
4	Net Savings	Evaluation Net Savings	Non-Deemed	Evaluation-Adjusted gross savings times NTGR	Ex post net
5	Net Savings	Ex-ante net savings	Verification and Research	Savings as recorded by the program tracking system, after adjusting for realization rates, free ridership, or spillover and any other factors the program may choose to use.	Program-reported net savings

‡ “Energy” and “Demand” may be inserted in the phrase to differentiate between energy (kWh, Therms) and demand (kW) savings.

† **Verification** = Verified Savings; **Research** = Impact Evaluation Research Findings; **Non-Deemed** = impact findings for programs without deemed parameters. We anticipate that any one report will either have the first two terms or the third term, but never all three.

§ Terms in this column are not mutually exclusive and thus can cause confusion. As a result, they should not be used in the reports (unless they appear in the “Terms to be Used in Reports” column).

## Individual Values and Subscript Nomenclature

The calculations that compose the larger categories defined above are typically composed of individual parameter values and savings calculation results. Definitions for use in those components, particularly within tables, are as follows:

**Deemed Value** – a value that has been assumed to be representative of the average condition of an input parameter and documented in the Illinois TRM or ComEd’s approved deemed values. Values that are based upon a deemed measure shall use the superscript “D” (e.g., delta watts<sup>D</sup>, HOU-Residential<sup>D</sup>).

**Non-Deemed Value** – a value that has not been assumed to be representative of the average condition of an input parameter and has not been documented in the Illinois TRM or ComEd’s approved deemed values. Values that are based upon a non-deemed, researched measure or value shall use the superscript “E” for “evaluated” (e.g., delta watts<sup>E</sup>, HOU-Residential<sup>E</sup>).

**Default Value** – when an input to a prescriptive saving algorithm may take on a range of values, an average value may be provided as well. This value is considered the default input to the algorithm, and should be used when the other alternatives listed for the measure are not applicable. This is designated with the superscript “DV” as in X<sup>DV</sup> (meaning “Default Value”).

**Adjusted Value** – when a deemed value is available and the utility uses some other value and the evaluation subsequently adjusts this value. This is designated with the superscript “AV” as in X<sup>AV</sup>

## Glossary Incorporated From the TRM

Below is the full Glossary section from the TRM Policy Document as of October 31, 2012<sup>32</sup>.

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

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

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

**Program Level Research:** An evaluation process that takes an alternate look into achieved program level savings across multiple measures. This type of research may or may not be

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<sup>32</sup> IL-TRM\_Policy\_Document\_10-31-12\_Final.docx

specific enough to inform future TRM updates because it is done at the program level rather than measure level. An example of such research would be a program billing analysis.

**Savings Verification:** An evaluation process that independently verifies program savings achieved through prescriptive measures. This process verifies that the TRM was applied correctly and consistently by the program being investigated, that the measure level inputs to the algorithm were correct, and that the quantity of measures claimed through the program are correct and in place and operating. The results of savings verification may be expressed as a program savings realization rate (verified ex post savings / ex ante savings). Savings verification may also result in recommendations for further evaluation research and/or field (metering) studies to increase the accuracy of the TRM savings estimate going forward.

**Measure Type:** Measures are categorized into two subcategories: custom and prescriptive.

**Custom:** Custom measures are not covered by the TRM and a Program Administrator’s savings estimates are subject to retrospective evaluation risk (retroactive adjustments to savings based on evaluation findings). Custom measures refer to undefined measures that are site specific and not offered through energy efficiency programs in a prescriptive way with standardized rebates. Custom measures are often processed through a Program Administrator’s business custom energy efficiency program. Because any efficiency technology can apply, savings calculations are generally dependent on site-specific conditions.

**Prescriptive:** The TRM is intended to define all prescriptive measures. Prescriptive measures refer to measures offered through a standard offering within programs. The TRM establishes energy savings algorithm and inputs that are defined within the TRM and may not be changed by the Program Administrator, except as indicated within the TRM. Two main subcategories of prescriptive measures included in the TRM:

**Fully Deemed:** Measures whose savings are expressed on a per unit basis in the TRM and are not subject to change or choice by the Program Administrator.

**Partially Deemed:** Measures whose energy savings algorithms are deemed in the TRM, with input values that may be selected to some degree by the Program Administrator, typically based on a customer-specific input.

In addition, a third category is allowed as a deviation from the prescriptive TRM in certain circumstances, as indicated in Section 3.2:

**Customized basis:** Measures where a prescriptive algorithm exists in the TRM but a Program Administrator chooses to use a customized basis in lieu of the partially or fully deemed inputs. These measures reflect more customized, site-specific calculations (e.g., through a simulation model) to estimate savings, consistent with Section 3.2.

## 7.2 Detailed Impact Research Findings and Approaches

### 7.2.1 Gross Impact Results

This section presents the results of Navigant’s research findings savings and approaches. These findings are provided for reference purposes, and are not indicative of the overall verified program savings. Navigant presents detailed verified program results in the main body of the report.

#### 7.2.1.1 Research Findings TRM Parameter and Algorithm Adjustments

Navigant performed a detailed engineering review of the ex-ante savings assumptions provided by CSG. Navigant recommends the following changes to measure savings calculations for CFLs and kitchen and bathroom faucet aerators. Navigant used the findings presented in Table 7-1 to inform the research findings savings calculations. Navigant applied these changes to the research findings savings; they do not affect verified savings.

**Table 7-1. Research Findings Impact Adjustments**

Measure	Navigant Update
All CFL Types	Per the Illinois TRM version 1.0 and 2.0, Navigant applied heating penalty calculations for CFLs to overall gas savings. Navigant applied the gas heating penalty to participants who installed CFLs in gas heated homes. The inclusion of heating penalty for gas heated homes caused total program therm savings to decrease.
Kitchen and Bathroom Aerators	The Illinois TRM version 2.0 includes additional example equations which further clarify the usage of specific parameters in the energy and gas savings equations for kitchen and bathroom faucet aerators. Navigant applied these updated assumptions for parameter to the kitchen and bathroom faucet aerator measures. This change caused kitchen aerator savings to increase and bathroom faucet aerator savings to decrease. Navigant recommends that this change be applied to aerator savings calculations for GPY3/EPY6.

The following equations and parameters are sourced from the Illinois TRM version 2.0.

#### Compact Fluorescent Bulbs

Per Section 5.5.1 of the IL TRM v 2.0, the total gas heating penalty for compact fluorescent bulb installations in gas heated homes is calculated as follows:

$$\Delta\text{Therms} = - (((\text{WattsBase} - \text{WattsEE}) / 1000) * \text{ISR} * \text{Hours} * \text{HF} * 0.03412) / \eta_{\text{Heat}}$$

**Where:**

WattsBase = Baseline wattage of lighting equipment

WattsEE = Efficient wattage of lighting equipment

ISR = In Service rate

Hours = Annual hours of use  
 HF = Heating Factor = 49% for interior/unknown locations; 0% for exterior/unheated locations  
 nHeat = 70% efficiency of heating system

While Navigant did apply heating penalty for electric savings for the verified program savings, Navigant did not apply the same heating penalty to verified gas savings. Navigant applied the heating penalty to gas heated homes for the research findings savings.

### **Kitchen and Bathroom Aerators**

Per Section 5.4.4 of the IL TRM v 2.0, total electric and gas savings for kitchen and bathroom faucet aerators is calculated as follows:

$$\Delta\text{Therms} = \% \text{FossilDHW} * ((\text{GPM\_base} * \text{L\_base} - \text{GPM\_low} * \text{L\_low}) * \text{Household} * 365.25 * \text{DF} / \text{FPH}) * \text{EPG\_gas} * \text{ISR}$$

$$\Delta\text{kWh} = \% \text{ElectricDHW} * ((\text{GPM\_base} * \text{L\_base} - \text{GPM\_low} * \text{L\_low}) * \text{Household} * 365.25 * \text{DF} / \text{FPH}) * \text{EPG\_electric} * \text{ISR}$$

The Illinois TRM version 2.0 includes additional example equations which further clarify the usage of specific parameters in the energy and gas savings equations for kitchen and bathroom faucet aerators. Navigant reviewed these clarifications and recommends the following methods for savings calculations:

DF = Drain Factor. The Illinois TRM version 1.0 is ambiguous to the application of DF. Based on clarification in the Illinois TRM version 2.0, Navigant applied a DF of 75% for kitchen aerators and 90% for bathroom aerators to the research findings savings calculations. Ex-ante calculations utilized the unknown DF of 79.5% for kitchen and bathroom aerators combined. Navigant recommends using the measure-specific DF in future program year savings calculations.

FPH = Faucets per Household. The Illinois TRM version 1.0 is ambiguous to the application of FPH in the savings equations. Based on clarification in the Illinois TRM version 2.0, Navigant used the total kitchen faucets per household in the kitchen aerators savings calculation, and the total bathroom faucets per household in the bathroom faucet aerator savings calculation. If the faucet quantities were unknown, Navigant applied the TRM-specific deemed FPH (1.0 for kitchen faucets and 2.83 for bathroom faucets). These parameters were used to calculate research findings savings for this measure. Navigant recommends using the measure-specific FPH in future program year savings calculations.

Based on research findings updates to CFL and faucet aerator savings, Navigant presents research findings gross savings by measure in Table 7-2. These gross savings utilize TRM-specific in-service rates.

**Table 7-2. Research Findings Gross Savings with TRM-Specified In-Service Rates**

	Measure	Therms	Therms RR	MWh	MWh RR
Direct Install Measures	9 Watt CFL	-473	-	74	1.00
	14 Watt CFL	-1797	-	268	1.00
	19 Watt CFL	-947	-	131	1.00
	23 Watt CFL	-903	-	122	1.00
	9 Watt Globe CFL	-800	-	211	1.00
	Shower Head	47,053	1.00	19	1.01
	Kitchen Aerator	1,432	1.81	1	2.27
	Bathroom Aerator	3,580	0.44	1	0.52
	Hot Water Temperature Setback	2,573	1.00	0	0.23
	Pipe Insulation	7,583	0.96	5	1.21
	Programmable Thermostat	5,216	0.93	0	-
	Programmable Thermostat Education	21,060	-	0	-
	Subtotal		83,576	1.16	832
Weatherization Measures	Attic Insulation	82,645	1.00	119	1.00
	Wall Insulation	16,150	1.00	2	1.00
	Floor Insulation (Other)	12,933	1.00	3	1.00
	Duct Insulation & Sealing	76	1.00	2	1.00
	Air Sealing	69,546	1.00	163	1.00
Subtotal		181,350	1.00	288	1.00
Total		264,926	1.05	1,120	1.00

### 7.2.1.2 Survey-Determined Installation and Persistence Rates

This section details the installation and persistence rate results based on full participant surveys conducted in GPY2/EPY5.

The installation rate is a ratio of customer-reported measure installations to those contained in the program tracking database. The persistence rate is used to reflect the removal of program measures, which can be thrown away, given away, sold, or put into storage. Unlike the installation rate, which can be gauged immediately after a contractor completes work, gauging persistence requires factoring in a period of time after installation before it can be properly measured. Multiplying an installation rate and a persistence rate results in an in-service rate for a measure, which signifies the percentage of a measure reported in the tracking system that is currently verified installed. Thus the in-service rate is multiplied against tracking system ex-ante data to determine verified gross savings.

Navigant used TRM-prescribed in-service rates to calculate verified gross savings for direct install measures. However, for program research findings savings, the evaluation team conducted a participant survey to determine estimates for in-service rates these measures. The survey gauged installation rates for measures the tracking system reported installed for each survey participant.

Following the installation rate question battery, all respondents were asked a two-part persistence question to identify 1) participants that reported uninstalling one of the measures installed in the program, and 2) which measures were uninstalled by each participant that reported uninstalling something.

Table 7-3 shows the installation and persistence rate results for direct install and weatherization measures from Navigant’s participant surveys alongside the in-service rates deemed in the Illinois TRM for direct install measures.

**Table 7-3. Survey-Determined Direct Install Measure Installation and Persistence Rates Compared to TRM In-Service Rates**

Measure	n=	Survey Installation Rate †	Survey Persistence Rate	Research Findings In-Service Rate	TRM In-Service Rate
All CFL Types	86	-	-	0.97‡	0.97
Low Flow Shower Head	96	0.99†	0.82	0.82	0.98
Kitchen Aerator	19	0.79†	0.88	0.88	0.95
Bathroom Aerator	94	0.97†	0.93	0.93	0.95
Hot Water Temperature Setback	19	0.63†	1.0	1.0	1.0
Pipe Insulation	81	0.80†	1.0	1.0	1.0
Programmable Thermostat	8	0.75†	1.0	1.0	1.0
Programmable Thermostat Education	36	0.31^	0.88^	0.27^	1.0

Source: Navigant participant surveys

† Navigant reports an installation rate of 1 for these measures as noted in CSG’s QAQC findings.

^ Navigant utilized the survey determine installation and persistence rates to calculate in-service rate for this measure. During QAQC ride-along trips and through conversations with program implementation staff, Navigant identified programmable thermostat education as a measure that is potentially inconsistently reported in the program tracking database, and also a measure that is not consistently implemented in each residence. Since this is a behavioral measure where an individual might reset the programming, there is also precedent to expect relapse and an in-service rate of less than 1. Since the TRM does not provide an estimate for this measure, the evaluation team will continue to use this value to estimate a survey-determined in-service rate for research findings gross savings calculations.

‡ Navigant gauged an overall research findings in-service rate for CFLs based on survey questions.

Note that according to the participant survey some installation rates are less than 100%. This may be due to respondent self-report recollection error. Navigant confirmed that CSG performs adequate QAQC follow-up checks on homes and accepts their reported installation rate of 100% for all measures except for programmable thermostat education. Navigant also assumed an installation rate and persistence rate of 1 for weatherization measures and did not gauge it in the survey as it is unlikely weatherization measures would be uninstalled. As a result, weatherization measures were all assigned an in-service rate of 1.

### 7.2.1.3 Research Findings Gross Program Impact Results

This section presents the evaluated HES Program gross savings based on the evaluation team’s research findings for direct install and weatherization measures for reference purposes (whereas the



verified gross savings in the body of the report were based on TRM-prescribed gross parameter estimates for direct install measures). These savings values include the installation rates, persistence rates, and in-service rates determined utilizing the participant surveys. Table 7-4 presents the gross program savings and realization rates based on research findings.

**Table 7-4. GPY2/EPY5 HES Program Research Findings Gross Savings**

	Measure	Therms	Therms RR*	MWh	MWh RR*
Direct Install Measures	9 Watt CFL	-474	-	74	1.00
	14 Watt CFL	-1801	-	269	1.00
	19 Watt CFL	-949	-	132	1.00
	23 Watt CFL	-905	-	122	1.00
	9 Watt Globe CFL	-802	-	211	1.00
	Shower Head	39,440	0.84	16	0.84
	Kitchen Aerator	1,319	1.67	0.7	2.09
	Bathroom Aerator	3,513	0.43	1.1	0.51
	Hot Water Temperature Setback	2,573	1.00	0.1	0.23
	Pipe Insulation	7,583	0.96	4.7	1.21
	Programmable Thermostat	5,216	0.93	0.0	-
	Programmable Thermostat Education	5,631	-	0.0	-
Subtotal		60,344	0.84	830	1.00
Weatherization Measures	Attic Insulation	82,645	1.00	119	1.00
	Wall Insulation	16,150	1.00	1.7	1.00
	Floor Insulation (Other)	12,933	1.00	3.1	1.00
	Duct Insulation & Sealing	76	1.00	1.6	1.00
	Air Sealing	69,546	1.00	163	1.00
Subtotal		181,350	1.00	288	1.00
Total		241,694	0.95	1,118	1.00

Source: Navigant analysis

\*RR = Realization Rate. This is the ratio of research findings gross to ex-ante gross savings.

## 7.2.2 Research Findings Net Program Impact Results

This section details the results of Navigant’s research net impact analysis for the HES program, which includes adjustments for both free ridership and spillover in the net-to-gross analysis.

### 7.2.2.4 Free-Ridership, Spillover, and Net-to-Gross

The objective of the free ridership assessment is to estimate the impact of program incited measures that would have been installed even in the absence of the program. This cannot be measured directly due to the inability to observe behavior in the absence of the program. Thus, free ridership is assessed



as a probability score for each measure. The evaluation relies on self-reported data collected during participant telephone surveys to assign free ridership probability scores to each measure. The objective of the spillover assessment is to estimate the impact arising from efficient measures installed as a result of the program that were not incented by the program. The evaluation also relies on self-reported data collected during the telephone surveys to identify these measures and assess the role of the program in the decision to install. Summing the free ridership and spillover scores and subtracting them from a factor of 1.0 results in a net-to-gross ratio that the evaluation team applied to research findings gross savings to estimate research findings net program savings.

Navigant calculated net-to-gross values for each direct install and weatherization measure based on the free ridership and spillover results determined using full and assessment-only participant surveys. Navigant utilized free ridership values from GPY1/EPY4 full-participant research, and updated spillover values based on GPY2/EPY5 full and assessment-only participant surveys. The evaluation team also used trade ally free ridership and spillover feedback that was combined with participant results as described in Section 4.2.3. Overall program free ridership, spillover, and NTGR values are shown in Table 7-5.

**Table 7-5. Overall Program Research Findings NTGR (Participant and TA Research Findings Consolidated)**

	Gas	Electric
FR	9%	20%
SO	14%	5%
<b>NTGR</b>	<b>1.05</b>	<b>0.85</b>

*Source: Navigant analysis of GPY1/EPY4 and GPY2/EPY5 full-participant and GPY2/EPY5 assessment-only participant surveys*

#### 7.2.2.5 Research Findings Net Program Impact Results

This section presents the evaluated HES Program net savings based on the evaluation team’s research findings for direct install and weatherization net-to-gross values (whereas the verified net savings in the body of the report were based on deemed net-to-gross values). The table below presents the net program savings and realization rates based on research findings.

**Table 7-6. Research Findings Net Program Savings and Realization Rates**

	Therms	Therms RR*	MWh	MWh RR*
Direct Install	87,113	-	701	-
Weatherization	197,813	0.82	295	0.83
Overall	284,926	0.81	996	0.81

*Source: Navigant analysis*

\*RR = Realization Rate. This is the ratio of research findings gross to ex-ante gross savings.

Table 7-7 shows the overall program ex-ante and researching findings gross and net savings.

**Table 7-7. GPY2/EPY5 Overall HES Program Research Findings Savings**

Retailer Category	Energy Savings (MWh)	Energy Savings (Therms)
Ex-Ante Gross	1,122	253,445
Ex-Ante Net	906 <sup>33</sup>	242,416 <sup>34</sup>
Research Findings Realization Rate <sup>†</sup>	1.20	1.00
Research Findings Gross	1,118	241,694
NTG Ratio <sup>‡</sup>	0.85	1.05
Research Findings Net	952.89	253,548.06
Planning Net Savings Goal	700	545,466
% Net Goal Achieved	136%	46%

Source: Navigant analysis

\* CFLs, temperature turndown, and thermostats are deemed; showerheads, aerators, pipe insulation are partially deemed; all weatherization measures are not deemed.

† Research findings realization rate represent the ratio between research findings gross and ex-ante gross savings.

‡ Overall NTG is the ratio between verified/research net and gross savings.

### 7.3 Trade Ally Interview Results Overview

Though trade allies were interviewed primarily to establish a trade ally NTGR, participating weatherization contractors were also asked to give their perspectives on the program’s strengths and weaknesses in terms of program marketing and outreach, and customer participation motives and barriers. Evaluation process research questions were addressed with the contractors, including effects of the weatherization incentive amounts and the EI2 informational party outreach method. A total of five out of nine program contractors were interviewed for this task. The following subsections summarize the findings from these interviews.

#### 7.3.1 Trade Ally Reporting on Program Awareness and Marketing and Outreach Effectiveness

Similarly as found in the last evaluation cycle for this program, the contractors report that the program is reaching the right audience given its broad-based approach. One respondent stated their company doesn’t have to do any marketing because the volume of business generated by the program keeps them busy.

Contractor reactions to the EI2 informational house parties were generally positive. One respondent said the parties were the best marketing strategy in the two years their company had been involved in the program, and another respondent said they were “great.” However, another contractor said the

<sup>33</sup> The CSG tracking system did not provide ex-ante net savings values. As a result Navigant used the value ComEd reported to the ICC in its GPY2 Q4 filing:

[http://ilsagfiles.org/SAG\\_files/Quarterly\\_Reports/ComEd/ComEd%20PY5,%20Q4.pdf](http://ilsagfiles.org/SAG_files/Quarterly_Reports/ComEd/ComEd%20PY5,%20Q4.pdf)

<sup>34</sup> The CSG tracking system did not provide ex-ante net savings values. As a result Navigant used the value Nicor Gas report to the ICC in its GPY2 Q4 filing: ICC Quarterly Report 4<sup>th</sup> Quarter PY2 Final.xlsx

parties they attended were generally “average to poor” in terms of recruiting customers though that contractor did have one party they considered a success for recruiting customers.

The contractors had a number of observations and opinions about the EI2 informational parties. A key strength of the informational parties, one respondent noted, was having an independent 3<sup>rd</sup> party hosting and conducting the party, so the contractor was presenting on behalf of the program as a participating contractor – a “no-pressure” approach for prospective customers to size up the program without feeling they’re getting a biased sales pitch. One contractor that is currently trying to return to the house party outreach method without EI2 has noticed that the independent 3<sup>rd</sup> party setting going away is causing prospective customers to have a more guarded interest in the program. One trade ally also noted a challenge with the house party outreach method is that some people schedule parties and then cancel them. Nonetheless, the same respondent said that when they actually get a house party they get an average of 2-3 jobs per house party. An important consideration to note for scheduling house parties that some party attendees may live in an apartment building or have other problems that disqualify them from the program such as not living in the program’s service area.

Word of mouth was also cited by contractors as an effective marketing strategy, along with advertising the program’s high incentive levels.

Three of the five contractors interviewed said they had “tagged” a number of their own customers into the program, indicating that the outreach strategy is having some use for building customer relationships and bringing customers into the program.

Two of the contractors interviewed reported being involved with “reach-back” efforts to attempt to promote previous assessment participants to change their mind and follow-through with weatherization work. That contractor, whose firm was one that was able to use their own staff for assessments, reported mixed success with the effort. The contractor reported it was hard to track previous participants, especially former house party participants, to see if they had ultimately followed-through with work, or even obtained an assessment. According to the contractor, there was “grey area” in the reach-back marketing effort that could be cleared up if the contractor had more control over the customer participation process. As a result of such grey areas, this contractor did a lot of blind reaching out that sometimes involved helping customers understand their assessment results, as some customers didn't know how to interpret their assessment results.

### **7.3.2 Trade Ally Reporting on Customer Participation Motives and Barriers to Participation**

#### Customer Participation:

The contractors interviewed generally agreed that customers understand the program and its participation process, though one contractor said there could be some further streamlining of the program as there are many “moving parts.” This contractor suggested a brown-bag or other networking meeting to discuss ways to further streamline the program process.

From the contractors’ point of view, customers appear to understand much of the assessment report information, though a contractor noted that it depends on how knowledgeable a customer is about energy efficiency in the first place. One contractor said customers understand about 2/3 of the report, and that fraction could be improved through a more customer-friendly report orientation and added assessor training in presenting the reports. Contractors noted that the EI2 informational house parties were very helpful for explaining the various details of the program including the assessment phase.

Contractors cited two barriers to participation relative to the program process: call center wait times (one contractor noted this) and delays between the assessment and actually installing specified projects (multiple contractors noted this). Interviewees indicated that there have been very few project cancellations, however.

Project work orders specify what the contractors are to install. There are few situations where customers ask to not have a measure installed that was specified in the project work order, so that problem has not been a major issue. On the other hand, one contractor said that there are sometimes problems with work order specifications whereby a work order item can't or shouldn't be installed – or they find there is an item that should be installed but was not specified in the work order. In such cases the contractor has to go through a change order process that can be problematic because of the time those order changes take to be completed, the time and cost to the contractor in addressing the changes, and addressing those changes with customers. This contractor suggested it would be useful to review the change order process and also improve assessor training to better ensure proper work order specification.

The contractors generally agreed the invoicing and documentation processes are acceptable even though they have some concern about the extent of paperwork involved, and one contractor particularly noted that some improvements have been made. A request was also made to pay contractors more quickly.

One contractor expressed concern that they do not have access to assessment infiltration test results so that they can compare with their own measurements made when they are sealing a home during a project. This situation has caused added time and cost to reconcile test results, including having to submit change orders regarding what air sealing is actually needed. This contractor suggested an effort to fully align program and contractor infiltration test procedures, as well as to provide contractors with infiltration test results.

In terms of barriers to installing weatherization projects, contractors said the price point is primary (that is, household budget priorities dictate against the project). Timing is also important: one contractor said projects have a better chance of being done if the program can minimize the time between when the program gets introduced to the customer and when the assessment is done, and then the time to when the project is scheduled. There have been situations where there have been delays in the process such that customers lose interest.

One contractor cited a lack of assessor focus on selling projects rather than focusing on achieving a target number of assessments done per month. The contractor felt the assessors were not spending enough time with customers to educate and otherwise prime them to undertake the project.

As to whether additional kinds of efficiency improvements might help improve participation rates, one contractor suggested a separate track for duct sealing, and another contractor suggested bundling appliance and HVAC equipment efficiency improvements with the program might be a good idea. There appears to be trade ally interest in adding to the program's measure scope.

Incentives Levels:

The contractors interviewed had little insight regarding the effect of the discounted energy assessment price on either overall assessment participation rates or conversions to actual

weatherization projects. One respondent thought the discount increased interest and that the \$49 level seemed “about right” in terms of garnering customer interest in having an assessment, but the remainder of those interviewed had no opinion.

As to the project incentive level having been increased in the last program year (to \$1,750 from \$1,250), three contractors indicated they saw an uptick in business, so from that perspective the higher incentive was successful. Along with the higher incentive level, two contractors also stated they felt the offer being a limited-time offer also spurred customers to action. On the down side, however, two contractors complained that it took longer for the program to process the paperwork and that slowed getting contractors paid, which in turn caused problems with contractors’ cash flow.

Program Influence:

The contractors interviewed mostly agreed that relatively low natural gas prices are not significantly depressing customers’ willingness to participate in the program, though one contractor did say they believe interest in the program is lower than it would be if gas prices were higher. Two contractors cited customers’ interest in improving comfort as an important reason to participate rather than a concern over current gas prices.

Contractors had difficulty evaluating the do-it-yourself (DIY) market, either as prompted by assessments that customers follow through on their own, or in general, though one respondent said he felt the general market is “significant.” Two contractors felt at least a handful of customers who’ve had assessments through the program have taken the DIY route, but were unsure of that percentage – anywhere from 5% to 25% was speculated. Two interviewees asserted that many DIY installations are done poorly, that customers can do more harm than good because they don’t know how to properly do the job. Furthermore, one trade ally reported that without an assessment many people wouldn’t attempt DIY weatherization work, short of someone marketing in a compelling way, because of a lack of detailed understanding of weatherization energy efficiency in the market.

**7.3.3 Trade Ally NTGR Results**

Calculation Methodology:

The trade ally NTGR methodology was based on the one used for the GPY1/EPY4 Home Energy Efficiency Rebate program evaluation. The evaluation team made modifications given the HES program provides weatherization measures wherein conversion rates and participation volume are key criteria in establishing free ridership rather than the adoption and sales of energy efficient equipment.

Trade Ally Perspective of Participant Free Ridership

To calculate participant free ridership using data obtained from the trade ally interviews, the trade allies were asked about their pre-program and post-program leads, converted projects, and projects outside of the program to determine a market share free ridership. The market share free ridership estimates the number of projects that a contractor had in the program in the current year that would have otherwise been part of the contractor’s participants even without the program. Contractors that had fewer projects in the past than the current total number of projects outside of the program are given a zero free ridership because the program has led to a considerable increase in project volume.

$$\text{Market Share FR} = \frac{[\text{PAST \# OF PROJECTS}] - [\text{TOTAL \# OF PROJECTS OUTSIDE OF PROGRAM}]}{[\text{TOTAL NUMBER OF CURRENT PROJECTS}]}$$

The evaluation team then calculated an alternate free ridership based on the contractor’s likelihood for implementing the same number of measures without the program and their perception of the program’s influence on customers’ decision to implement weatherization measures.

$$\text{Alternate FR} = \frac{[\text{PROGRAM INFLUENCE SCORE}] - (10 - [\text{PROGRAM IMPORTANCE SCORE}])}{20}$$

The evaluation team then averaged the two free ridership scores to estimate an overall free ridership score per contractor.

Participating Trade Ally Volume Increase Spillover

The evaluation team calculated spillover that may have occurred due to an increase in contractor participation volume due to the program that may have not gone through the program. To calculate participating trade ally spillover using data obtained from the trade ally interviews, the trade allies were asked to estimate approximately what percentage of their leads followed through with weatherization work prior to the program and after the program. Then their self-reported estimate for the percentage of customers that are currently outside of the program was used to estimate potential volume increase spillover.

$$SO = ([\text{Current Conversion Rate}] - [\text{Preprogram Conversion Rate}]) * [\% \text{ Customers Outside of Program}]$$

By determining the change in conversion rate between PY2 and their pre-program conversion rates and multiplying it against the current percentage of customers outside of the program, the evaluation team estimated potential spillover that has resulted from the program increasing contractor conversion rates. Other qualitative spillover insights due to higher installation standards adoption and non-participant contractor influence are provided in the TA interview results discussion below.

Free Ridership:

In this evaluation cycle, only weatherization contractors were polled regarding their opinions about the program’s free ridership influence (the previous evaluation cycle reported both energy advisors’ and contractors’ estimate of program influence). The current evaluation’s finding of the program being very influential in customers’ decisions to select measures to install (8+ on a 0-10 scale) confirms the finding from last year and was supported by all respondents. This suggests the program continues to play a significant role in helping customers decide what weatherization to install.

Further, the program continues to influence what then actually gets installed, with four of the five contractors interviewed stating from 6.5-10 on a 0-10 point influence scale. This influence applied for the “tagged” customers of all the contractors interviewed, and for all customers of four of the five contractors interviewed. The dissenting contractor felt that the non-tagged customers they served are showing a low influence level on measures installed (2 on the 0-10 scale) because that contractor believes the energy advisors generating the contractor’s projects are not doing a good job, for example by not accurately identifying appropriate measures to install.

The contractors interviewed estimated 25-50% lower energy savings without the program across all customers, and either about the same or somewhat better energy impact among their tagged



customers. Thus, contractors see a difference with having the program in terms of its general influence on ultimate energy savings.

Based on the interviewed contractors' responses, the free ridership estimate for the GPY2/EPY5 program year is 7%.

Program Spillover:

All the contractors interviewed have at least 4% of their customers being program non-participants, and as such all contractors were asked about possible program spillover. To reiterate, customers are non-participants primarily for economic and qualification reasons, though a few are lost due to program delays or a general distrust of utilities.

Contractors are evenly divided as to whether the program influenced them to install measures to higher standards (either for in-program or out-of-program customers): three said it did and two said it did not. Improving practices per BPI's and the program's QA/QC standards was cited by one contractor, and incorporating health and safety issues into their practice was cited by another contractor. The level of influence on practice standards ranged from 5 to 10 on a 0-10 scale. Thus, the program continues to help at least some contractors improve their weatherization practices.

As to whether contractors have been influenced by the program to install more efficiency measures (including those not incented by the program) in their work outside the program beyond what they'd have done absent the program, two of the five contractors interviewed said it did, which is a similar fraction as found in the last evaluation cycle for this program. Spray foam applications, air sealing and BPI-grade installations were cited as measures (or installation quality) being done outside, but influenced by the program. Both contractors who said the program influenced such work said the level of influence was 5 on a 0-10 point influence scale, while the other two said the program had no influence (0 on a 0-10 point scale), so a rough influence scale average of 2.5 is estimated for the five contractors interviewed.

Based on the interviewed contractors' responses, the spillover estimate for the GPY2/EPY5 program year is 5%.<sup>35</sup>

Non-Participant TA Spillover:

Three of the five contractors interviewed said they believe the program is putting pressure on non-program contractors' to lower their prices (the other two respondents did not know). One respondent said, emphatically, that weatherization is a very low-margin business in general, so the program really is just helping them be profitable at all by way of the incentives available to cover project costs and a modest profit. Another contractor said that pricing comparisons are difficult to make because of the program's project-based structure and higher quality standard, either or both of which may or may not be incorporated in non-participating contractors' weatherization projects.

**7.3.4 Trade Ally Suggested Program Adjustments and Enhancements**

None of the contractors interviewed have had issues installing the program's qualifying products.

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<sup>35</sup> One trade ally's interview results were omitted because the evaluation team believes their responses to key NTG questions were not reasonable, likely due to misunderstanding the questions.

As to the overall program design and operations, two of the four contractors interviewed felt the program generally is in good working order, though one of them suggested continuing to work on speeding up the post-assessment program processes. A third respondent cited the Prescriptive program as a useful evolution to complement the HES program design. The fourth contractor cited significant problems with the work order process, saying there are too many inaccuracies coming out of the assessments (e.g., wrong measurements, inappropriate scope of work) and that too much time is being taken to rectify the mistakes the contractor is seeing in work orders they are being given. This contractor ascribes the problem to inadequately trained or qualified energy advisors, as well as the administrative process to handle change orders. This contractor suggests improving assessor sales skills and technical expertise, and for having advisors spend more time with customers whom they believe will take the additional time as they'll become better educated and better understand what's needed to do a program-quality project.

The program's big strength, reported one contractor, is the incentive but also the health and safety aspect of the program's assessments. This contractor also said it's a shame that house party model has been discontinued in GPY3/EPY6 because its collegial approach proved helpful in educating customers and providing independent credibility (i.e., not just the potentially biased view of a contractor one-on-one with a customer with little knowledge about energy efficiency).

One contractor suggested the program try to enhance the teamwork relationships among the contractors, advisors and program staff through group meetings to address program weaknesses and that would include all those interested, not just individual meetings between staff and a given contractor as this contractor has experienced. This contractor also likes the idea of a contractor being able to use their own energy assessors as advisors to conduct assessments and so have a cradle-to-grave relationship with customers. A benefit of such an approach also could be better work order consistency (which has been problematic for this contractor). Such developments of course would need to be carefully administered to ensure program-procedural consistency and high-quality work, but the suggestions seem to have merit.



**7.4 Data Collection Instruments**

**7.4.1 Joint HES PY2 Full Participant Survey**

HOME ENERGY SAVINGS PROGRAM – NICOR/COMED  
FULL PARTICIPANT SURVEY

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**SAMPLE VARIABLES MAP TO TRACKING DATABASE VARIABLES**

- EI2P
  - *Identifies whether a customer was an EI2 House Party referral participant or not (if EI2P=1, participant was referred by the EI2 House Party)*
- CUSTNAME
  - *Contact name in tracking database: NAME FIRST + NAME LAST*
- ADDRESS
  - *Customer address for confirmation if phone number used to contact customer is different than the one in the sample file/tracking system (when call rescheduled)*
- PHONE NUMBER
  - *(Primary; use Phone\_Number\_Secondary if unable to contact primary # after 4 attempts)*
- AUDIT\_DATE
  - *date audit performed (ex. July 1, 2011)*
- AFEE
  - *Audit fee paid by customer; if 1=\$99, if 2=\$49*
- C\_FLAG
  - *this was flagged if MEASURE ID = 1 OR 2 OR 3 OR 4 OR 19 OR 20 installed (0,1)*
- CFL\_QTY
  - *MEAS\_QTY (quantity of measure) in tracking system for all CFL measures installed*
- SH\_FLAG
  - *this was flagged if MEASURE ID = 5 OR 20 installed (0,1)*
- KA\_FLAG
  - *this was flagged if MEASURE ID = 6 installed (0,1)*
- BA\_FLAG
  - *this was flagged if MEASURE ID = 7 installed (0,1)*
- HWT\_FLAG
  - *this was flagged if MEASURE ID = 8 installed (0,1)*
- PI\_FLAG
  - *this was flagged if MEASURE ID = 9 installed (0,1)*
- PT\_FLAG
  - *this was flagged if MEASURE ID = 10 installed (0,1)*
- PTE\_FLAG
  - *this was flagged if MEASURE ID = 11 installed (0,1)*
- AI\_FLAG
  - *this was flagged if MEASURE ID = 12 installed (0,1)*
- WI\_FLAG
  - *this was flagged if MEASURE ID = 13 installed (0,1)*
- OTHER\_FLAG
  - *this was flagged if MEASURE ID = 14 installed (0,1)*
- AS\_FLAG
  - *this was flagged if MEASURE ID = 16 installed (0,1)*

**Measure ID Codes**

MEASURE_ID	MEASURE_ID_NAME
1	9 Watt CFL
2	14 Watt CFL
3	19 Watt CFL
4	23 Watt CFL
5	Shower Head
<u>6</u>	<u><i>Kitchen Aerator</i></u>
7	Bathroom Aerator
<u>8</u>	<u><i>Hot Water Temperature Setback</i></u>
9	Pipe Insulation
10	Programmable Thermostat
11	Programmable Thermostat Education
12	Attic Insulation
13	Wall Insulation
14	Floor Insulation (Other)
<u>15</u>	<u><i>Duct Insulation &amp; Sealing</i></u>
16	Air Sealing
19	9 Watt Globe CFL
20	Showerhead Handheld

**Note: Underlined and italicized entries above indicate non-key measures -those contributing <5% of DI or weatherization measures' total savings- that were omitted in spillover questions (but not installation and persistence rate questions).**

**INTERVIEWER INSTRUCTIONS**

1. Call is to be placed asking to speak to the individual named in the customer contact information obtained from program records.
2. If that individual no longer has the phone number of record, ask the respondent if they live at [customer address of record].
3. If the individual of record no longer lives at address of record thank and terminate.
4. Make at least 5 attempts to each customer at different times of the day/week.
5. The purpose of the introductory script is to ensure the survey is answered by the primary decision maker involved in enrolling in the Nicor Gas and ComEd Home Energy Savings program and who was present during the home energy assessment (audit).

6. The program is jointly run by Nicor Gas and ComEd, so the customer will have accounts with both utilities.
7. Initial questions are to qualify the respondent.

### **PROGRAM INTRODUCTION**

Hello, this is [INTERVIEWER'S NAME] from Blackstone Group, calling on behalf of Nicor Gas and ComEd. This is not a sales call. We are contacting customers who have participated in Nicor Gas and ComEd's *Home Energy Savings Program*. May I please speak with [CUSTNAME]? [IF NEEDED: This program provided an on-site home energy assessment (energy audit) and follow-up weatherization actions, including educational information, free installation of energy efficient upgrades such as CFL light bulbs and high-efficiency showerheads and faucet aerators, and incentives for various energy efficiency actions that were installed by a program contractor. I'd like to assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone.]

Were you the person that was at home and present during the home energy assessment (energy audit) and the person most familiar with the work done by the program? (IF NOT: May I please speak with the person who was present during the home energy assessment (energy audit) and who is most familiar with the work done by the program?)

CONTINUE WITH RIGHT PERSON: Hello, this is [INTERVIEWER'S NAME] from Blackstone Group, calling on behalf of Nicor Gas and ComEd. This is not a sales call. We are contacting customers who have participated in Nicor Gas and ComEd's *Home Energy Savings Program*. We are conducting a study to evaluate Nicor Gas and ComEd's *Home Energy Savings Program* and would like to include your opinions. [IF NEEDED: This program provided an on-site home energy assessment (energy audit) and follow-up energy saving actions, including educational information, free installation of energy efficient upgrades such as CFL light bulbs and high-efficiency showerheads and faucet aerators, and incentives for various weatherization actions that were installed by a weatherization contractor. I'd like to assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone. This study is required by the Illinois Commerce Commission and will be used to verify the effectiveness of the program and to make improvements.]

(IF NEEDED: It will take about 20 minutes)

(IF VERIFICATION IS NEEDED: TELL THEM THEY CAN CALL TERRI BURNS OF NICOR GAS AT 630 – 388 – 2380. [IF PROMPTED: TERRI IS AN ADMINISTRATIVE ASSISTANT SERVING THE ENERGY EFFICIENCY DEPARTMENT.]

### **Cell Phone Safety**

- C1. Are you currently talking to me on a regular landline phone or a cell phone?
1. Regular landline phone
  2. Cell phone
  98. (Don't Know)
  99. (Refused)

**[ASK IF C1= 2]**

C2. Are you currently in a place where you can talk safely and answer my questions?

1. Yes
2. (No, schedule a callback)
3. (No, do not call back)
98. (Don't know, schedule a callback)
99. (Refused, schedule a callback)

**Participation Verification**

V1. Our records indicate that you received a home energy assessment through Nicor Gas and ComEd's Home Energy Savings program, where an energy assessor identified opportunities to improve the energy efficiency of your home. Then, after the assessment, the recommended energy efficiency upgrades were installed at your home. Is that correct?

1. Yes
2. (No, I did not have a home energy assessment) [\[NOTE AND TERMINATE\]](#)
3. (No, I had a home energy assessment but did not have the follow-up energy efficiency work done through the program) [\[NOTE AND TERMINATE\]](#)
98. Don't know [\[TERMINATE\]](#)
99. Refused [\[TERMINATE\]](#)

*To start, we have several questions regarding the energy efficiency upgrades that were installed in your home. The answers to these questions are very important so Nicor Gas and ComEd can determine how much energy is being saved by the program.*

**Direct Install Measure Installation and Persistence Rates (excluding CFLs)**

Our records show that the following instant upgrades were installed through the *Home Energy Savings Program* during the initial energy assessment (energy audit) done at the home. [\[READ EACH INSTANT UPGRADE PER PROGRAM RECORD AND VERIFY WITH CUSTOMER:\]](#) Is this correct?

- DIMV2. [if SH\_FLAG=1] Efficient Showerhead
- DIMV3. [if BA\_FLAG=1] Bathroom Faucet Aerator(s)
- DIMV4. [if PI\_FLAG=1] Pipe Insulation
- DIMV5. [if PT\_FLAG=1] A Programmable Thermostat
- DIMV6. [if PTE\_FLAG=1] Programmable Thermostat Temperature Setting and Programming
- DIMV7. [if KA\_FLAG=1] Kitchen Faucet Aerator(s)
- DIMV8. [if HWT\_FLAG=1] Hot Water Heater Temperature Setback

1. (Yes, upgrade was installed/action taken)
2. (No, upgrade was not installed/action not taken)
98. (Don't know)
99. (Refused)

**[IF RESPONDENT STATES NO NON-CFL DIRECT INSTALL UPGRADES WERE INSTALLED, SKIP TO CFLMV1]**

DIMP1. Since participating in the program, have you since removed or undone any of those items [IF DIMV6=1, “including resetting the programmable thermostat settings that were programmed during the home energy assessment?”]

1. Yes
2. No
98. Don’t know
99. Refused

**[ASK DIMP1a IF DIMP1=1]**

DIMP1a. What did you uninstall or undo? [ACCEPT MULTIPLE]

1. Efficient showerhead
2. Bathroom faucet aerator
3. Pipe insulation
4. Hot water temperature setback
5. Programmable thermostat settings
6. Programmable thermostat
7. Kitchen faucet Aerator
- 98 Don’t know
99. Refused

**[ASK DIMP1b IF DIMP1=1]**

DIMP1b. Why did you uninstall/undo the item(s)? [ASK FOR EACH MEASURE IN DIMP1a]

RECORD BERBATIM- OPENEND

98. Don’t know
99. Refused

**[ASK DIMP2a and DIMP2b IF DIMV6=1]**

DIMP2a. Prior to having had your thermostat programmed during the home energy assessment, did you regulate your thermostat manually to turn your heating and cooling up and down?

1. Yes
2. No
98. Don’t know
99. Refused

**[IF DIMV6=1 AND DIMP1a=5, SKIP TO CFLMV1]**

DIMP2b. Have you since changed the settings that were programmed into the thermostat during the home energy assessment?

1. Yes
2. No
98. Don’t know
99. Refused

## CFL Installation and Persistence Rates

[IF C\_FLAG=1 ASK, ELSE SKIP TO DIM21]

CFLMV1. [Wording if CFL\_QTY=1] Our records show that [CFL\_QTY] compact fluorescent lamp, also known as a CFL, was installed during the Home Energy Savings visit to your home. Is this correct?

[Wording if CFL\_QTY>1] Our records show that [CFL\_QTY] compact fluorescent lamps, also known as CFLs, were installed during the Home Energy Savings visit to your home. Is this correct?

1. Yes, quantity is correct
2. No, quantity is incorrect
98. Don't know [SKIP TO DIM21]
99. Refused [SKIP TO DIM21]

[ASK CFLMV2 IF CFLMV1=2]

CFLMV2. How many CFLs do you recall were installed during the Home Energy Savings visit? [Prompt for best guess.] [USE AS CFL\_QTY FOR REMAINDER OF SURVEY UNLESS DK OR REF THEN SKIP TO DIM21]

NUMERIC OPEN END up to 999

95. None [SKIP to DIM21]
98. Don't know [SKIP TO DIM21]
99. Refused [SKIP TO DIM21]

DIM2. Did you have any CFLs installed BEFORE participating in the program?

1. Yes
2. No
98. Don't know
99. Refused

[ASK DIM3 IF DIM2=1]

DIM3. About how many CFLs did you have installed BEFORE participating in the program?

NUMERIC OPEN END up to 999

98. Don't know
99. Refused



**[ASK HC8 IF DIM2=1]**

HC8. Before participating in the program, approximately what percent of the screw-in light bulb sockets in your home were already equipped with CFL bulbs?

NUMERIC OPEN END up to 99

- 98. Don't know
- 99. Refused

CFLMV5. Of the CFLs you received during the program, how many did you use to replace other CFLs you already had previously installed?

NUMERIC OPEN END up to CFL\_QTY

- 98. Don't know
- 99. Refused

CFLMV5a. **[ASK IF CFLMV5>0]** Why did you choose to remove an existing CFL and replace it with a program CFL? **(DO NOT READ; MULTIPLE RESPONSE, PROMPT FOR ADDITIONAL)**

- 1. THE NEW CFL WAS BRIGHTER
- 2. THE NEW CFL WOULD LAST LONGER
- 3. THE NEW CFL WAS MORE EFFICIENT
- 4. SIMPLY BECAUSE THE NEW CFL IS NEWER
- 5. THE NEW CFL DID NOT TAKE AS LONG TO GET BRIGHT
- 6. BETTER FIT IN FIXTURE
- 7. IT WAS FREE
- 97. OTHER - SPECIFY
- 98. DON'T KNOW
- 99. REFUSED

CFLMV6. **[Wording if CFL\_QTY=1]** Is the CFL you received from the program still installed somewhere in your home?

**[Wording if CFL\_QTY>1]** Are all of the CFLs you received from the program still installed somewhere in your home?

- 1. Yes **[SKIP TO DIM21]**
- 2. No
- 98. Don't know **[SKIP TO DIM21]**
- 99. Refused **[SKIP TO DIM21]**

[ASK CFLMV7 IF CFLMV6 =2 AND CFL\_QTY=1]

CFLMV7. Which of the following best describes what happened to the CFL that was removed? (READ LIST AND RECORD ONE RESPONSE)

1. It was thrown away
2. It is in storage
3. It was sold or given away
97. Other, specify
98. Don't know
99. Refused

[ASK CFLMV8 IF CFLMV6 =2 AND CFL\_QTY>1]

CFLMV8. How many of the CFLs you originally received from the program have you taken out and are no longer installed in any light fixture?

NUMERIC OPEN END up to 999 [NUMBER REPORTED = CFLS\_REMOVED]

98. Don't know[SKIP TO DIM21]
99. Refused [SKIP TO DIM21]

[ASK CFLMV11 IF CFLMV6 =2 AND CFL\_QTY>1]

CFLMV11. How many PROGRAM bulbs have been sold to someone else, given away or thrown away?

NUMERIC OPEN END up to CFLS\_REMOVED

98. Don't know
99. Refused

[IF CFLMV11 = CFLS\_REMOVED, THEN SKIP TO DIM21]

[ASK CFLMV12 IF CFLMV6 =2 AND CFL\_QTY>1]

CFLMV12. How many are in storage?

NUMERIC OPEN END up to CFLS\_REMOVED

98. Don't know
99. Refused

[IF CFLMV12+CFLMV11= CFLS\_REMOVED, THEN SKIP TO DIM21]

[IF CFLMV11 OR CFLMV12 = 98 or 99 THEN SKIP TO DIM21]

**[CLFS REMOVED check]**

IF CFLMV11+ CFLMV12 = CFLS\_REMOVED

then proceed to DIM21.

ELSE IF CFLMV11+ CFLMV12 > CFLS\_REMOVED

then read “I must have made a mistake, those quantities add up to more CFLs than you said were removed. Let me read through the last few questions again” and skip back to CFLMV8

ELSE IF CFLMV11+ CFLMV12 < CFLS\_REMOVED

then proceed to CFLMV14]

CFLMV14. What was done with the remaining  $[CFLS\_REMOVED - (CFLMV11 + CFLMV12)]$  CFLs?

**RECORD VERBATIM OPEN END**

98. Don't know

99. Refused

## Direct Install Measure Spillover

DIM21. Have you installed any more CFLs, Efficient Showerheads, Bathroom Aerators, or Pipe Insulation since you received the one(s) through the program?

1. Yes

2. No

98. Don't know

99. Refused

**[ASK IF DIM21 =1, OTHERWISE SKIP TO WM21]**

DIM21a. What did you install? **[Check all that apply]**

1. CFLs

2. Pipe Insulation

3. Bathroom Aerator

4. Efficient Showerhead

98. Don't Know

99. Refused

**[ASK DIM22 and DIM23 FOR EACH DIM21a=1, 2, 3, 4; IF 98 or 99, SKIP TO WMV1]**

DIM22. How many [IF DIM21a = 2, “How many feet of...”] additional [INSERT MEASURE] have you installed?

**NUMERIC OPEN END up to 999**

98. Don't know

99. Refused

DIM23. How influential was the program in encouraging you to install the additional [INSERT MEASURE DIM21a]? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

NUMERIC OPEN END from 0 to 10

- 98. Don't know
- 99. Refused

## Weatherization Measure Verification

Our records show that the following weatherization upgrades were installed through the *Home Energy Savings Program* after your home energy assessment. [READ EACH WEATHERIZATION UPGRADE PER PROGRAM RECORD AND VERIFY WITH CUSTOMER:] Is this correct?

- WMV1. [if AS\_FLAG=1] Air Sealing
- WMV2. [if AI\_FLAG=1] Attic Insulation
- WMV3. [if WAL\_FLAG=1] Wall Insulation
- WMV4. [if OTHER\_FLAG=1] Other Insulation

- 1. Yes, item was installed
- 2. No, item was not installed
- 98. Don't know
- 99. Refused

## Weatherization Measure Spillover

WM21. Were there any other energy efficiency upgrades that were recommended to you as part of the *Home Energy Savings Program* that you didn't have installed?

- 1. Yes
- 2. No
- 98. Don't know
- 99. Refused

### [ASK WM22 IF WM21=1]

WM22. What upgrades did you choose to not have completed? [ACCEPT MULTIPLE OPTIONS]

- 1. Air Sealing
- 2. Wall insulation
- 3. Attic Insulation
- 4. Other Insulation
- 97. OTHER [Record]
- 98. Don't know
- 99. Refused

**[ASK WM23 IF WM21=1]**

WM23. Why did you choose not to have these additional recommended upgrades completed?

1. Too expensive
2. The payback would take too long
3. The work would involve modifications to my home I would prefer not done
4. Haven't gotten around to it yet/too busy
97. OTHER [\[Record\]](#)
98. Don't know
99. Refused

WM24. Have you installed any more of the weatherization energy efficiency items you got through the program on your own or through a contractor outside of the program since participating?

1. Yes
2. No
98. Don't know
99. Refused

WM24a. [\[ASK IF WM24 = 1\]](#) What additional insulation work did you have done after participating in the program? [\[Check all that apply\]](#)

1. Air Sealing
2. Wall insulation
3. Attic Insulation
4. Other Insulation
98. Don't know
99. Refused

**5. [IF WM24a=1, 2, 3, 4 ASK WM24b THROUGH WM24c FOR EACH CHECK ABOVE, OTHERWISE, SKIP TO P1]**

WM24b. How influential was your earlier participation in the program in encouraging you to install the additional [\[INSERT MEASURE WM24a\]](#)? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

[NUMERIC OPEN END from 0 to 10](#)

98. Don't know
99. Refused

WM24c. Why didn't you do the work through the program?

1. (More time-consuming to perform the work through the program)
2. (Program is more expensive)
3. (Program doesn't offer the measure)
97. OTHER [\[Record\]](#)
98. Don't know
99. Refused

## Process Questions

### Marketing and Outreach

P1. Which best describes you?

1. Before learning about the Home Energy Savings program, I did not think about energy efficiency changes in my home.
2. Before learning about the Home Energy Savings program, I thought about energy efficiency changes in my home, but did not do anything.
3. Before learning about the Home Energy Savings program, I already made some changes in my home to save energy.
4. Before learning about the Home Energy Savings program, I already made major changes in my home to save energy.
98. Don't Know
99. Refused

P2. How did you *first* hear about the Home Energy Savings program? [\[DO NOT READ LIST \]](#)

1. BROCHURE/FLYER THROUGH DIRECT MAIL
2. INTERNET
3. CUSTOMER CALLED COMED TO ASK ABOUT REDUCING ENERGY BILL
4. COMED REPRESENTATIVE – OTHER
5. CUSTOMER CALLED NICOR TO ASK ABOUT REDUCING ENERGY BILL
6. NICOR REPRESENTATIVE – OTHER
7. WORD-OF-MOUTH
8. CONTRACTOR REFERRAL
9. COMMUNITY EVENT
10. E12 HOUSE PARTY
97. OTHER, SPECIFY
98. DON'T KNOW
99. REFUSED

P3. Before participating, did you have any concerns or skepticism about the program and its offerings?

1. Yes
2. No
98. Don't know
99. Refused

**[SKIP P4 IF P2=8]**

P4. Did you reach out to the program to participate because the contractor that ultimately did your work recommended it to you?

1. Yes
2. No
98. Don't know

99. Refused

**[IF EI2P=1 ASK P5-P6a]**

P5. Where you a host for an informational house party where a contractor and program staff presented information on the program?

1. Yes
2. No
98. Don't know
99. Refused

P6. On a scale of 0-10, where 10 is very influential, how influential was the house party informational session in encouraging you to participate in the program?

**[RECORD SCORE 0-10]**

98. Don't know
99. Refused

**[IF P6 > 4, ASK P6a]**

P6a. What made the house party informational session influential in encouraging you to participate in the program?

**[DO NOT READ LIST , ACCEPT MULTIPLE RESPONSES]**

1. UNDERSTANDING THE EXTENT OF THE WORK THE PROGRAM WOULD INVOLVE
2. IT WAS FREE
3. OVERCOMING SKEPTICISM ABOUT PROGRAM
4. LEARNING ABOUT THE INCENTIVES AVAILABLE THROUGH THE PROGRAM
5. THIS WAS THE FIRST TIME I HEARD ABOUT THE PROGRAM
6. LEARNING ABOUT THE MONEY SAVING AND COMFORT BENEFITS OF CONDUCTING ENERGY EFFICIENCY WORK
7. RECEIVING PROGRAM LITERATURE AND WAYS TO FIND OUT MORE INFORMATION ABOUT THE PROGRAM
8. INFLUENCE FROM SEEING POSITIVE REACTION TO THE PROGRAM FROM FRIENDS/NEIGHBORS/OTHER ATTENDEES – INCLUDING
9. MEETING THE CONTRACTOR THAT WOULD DO THE WORK ON OUR HOME
97. OTHER: **[RECORD]**
98. DON'T KNOW
99. REFUSED

P7. After your home energy assessment, did you have any concerns over...?

**READ LIST, ACCEPT MULTIPLE RESPONSES**

1. Financial planning/affording the work/cost of the work
2. Finding a convenient time to do the work

- 3. Shopping around for better prices or other incentive opportunities
- 4. Waiting to see how a friend/other participant's work turned out and their satisfaction
- 97. Other, [specify]
- 98. Don't know
- 99. Refused

**Pre-Assessment EE Commitment, Knowledge, and Assessment Pricing**

P8a. Thinking back to when you signed up for the home energy assessment, on a scale of 0 to 10, where 10 means very committed, how committed were you to doing some sort of energy efficiency work on your home?

**RECORD SCORE 0-10**

- 98. Don't know
- 99. Refused

P8b. On a scale of 0 to 10, where 10 is very knowledgeable, how knowledgeable were you about the energy efficiency work that could be done on your home prior to participating in a home energy assessment?

**RECORD SCORE 0-10**

- 98. Don't know
- 99. Refused

**[ASK IF AFEE=2, OTHERWISE SKIP TO P8cc]**

P8ca. Looking back to the home energy assessment and the value it provided you, would you have been willing to pay \$75 for the assessment?

- 1. Yes
- 2. No
- 98. Don't know
- 99. Refused

**[IF P8ca = 1, CONTINUE TO P8cb, OTHERWISE SKIPE TO P8ce]**

P8cb. Would you have been willing to pay \$99 for the assessment?

- 1. Yes
- 2. No
- 98. Don't know
- 99. Refused

**[IF P8cb = 1, CONTINUE TO P8cc, OTHERWISE SKIPE TO P8ce]**

P8cc [IF AFEE=1, "Looking back to the home energy assessment and the value it provided you"] would you have been willing to pay \$150 for the assessment?

- 1. Yes
- 2. No
- 98. Don't know



99. Refused

[IF P8cc = 1, CONTINUE TO P8cd, OTHERWISE SKIPE TO P8ce]

P8cd. How about \$200?

1. Yes
2. No
98. Don't know
99. Refused

P8ce. What is the most you would have paid for the assessment?

RECORD DOLLAR AMOUNT

98. Don't know
99. Refused

### Satisfaction

SA1. On a scale of 0 to 10, where 0 is very dissatisfied and 10 is very satisfied, how would you rate your satisfaction with... [SCALE 0-10; 96=not applicable, 98=Don't know, 99=Refused][ROTATE ITEMS]

- a. The process to sign up for the program
- b. The instant rebate you received for the weatherization work
- c. The measures you received through the program?
- d. The time it took to schedule the Home Energy Savings program assessment (energy audit)?
- e. The time it took to schedule the insulation work after the home energy assessment (energy audit) was done?
- f. The representative that visited your home to conduct the home energy assessment (energy audit)?
- g. The contractor who installed the weatherization upgrades?
- h. Information you received about the program
- i. [IF EI2P=1] The House Party program informational session you attended
- j. The Home Energy Savings program overall?

### ASK SA2 IF ANY SA1<=4]

SA2. What are the reasons for your dissatisfaction with any aspect of the program?

Record verbatim – OPEN END

98. Don't know
99. Refused

SA3. How could the program be improved, if at all, from your perspective?

Record verbatim – OPEN END

98. Don't know
99. Refused

### Demographic Questions

D1. Do you own or rent your home?

1. Own
2. Rent/lease

- 97. Other, specify
- 98. Don't know
- 99. Refused

D2. In order to help us understand our survey findings factoring in customer age ranges, would you please tell me your age range from the following list? [ [READ LIST](#)]

- 1. 18-30
- 2. 31-40
- 3. 41-50
- 4. 51-60
- 5. 61-70
- 6. 71-80
- 7. 80+
- 98. DON'T KNOW/NOT SURE
- 99. REFUSED

D3. In order to help us understand our survey findings better, could you please tell us what your income level is? Please stop me when I say the range that includes your total family income in 2012 before taxes.

- 1. UNDER \$15,000
- 2. \$15,000 to LESS THAN \$30,000
- 3. \$30,000 to LESS THAN \$50,000
- 4. \$50,000 to LESS THAN \$75,000
- 5. \$75,000 to LESS THAN \$100,000
- 6. Over \$100,000
- 98. DON'T KNOW/NOT SURE
- 99. REFUSED

**CLOSING**

Those are all the questions I have. On behalf of Nicor Gas and ComEd, thank you very much for your time. Your input will be valuable to the program in the future!

**7.4.2 Joint HES PY2 Partial Participant Survey**

## Home Energy Savings Program – Nicor/ComEd Assessment-Only Participant Survey

### Contents

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**SAMPLE VARIABLES MAP TO TRACKING DATABASE VARIABLES**

- PYEAR
  - *Identifies whether a customers participated in GPY1/EPY4 or GPY2/EPY5*
- EI2P
  - *Identifies whether a customer was an EI2 House Party referral participant or not (if EI2P=1, participant was referred by the EI2 House Party)*
- CUSTNAME
  - *Contact name in tracking database: NAME FIRST + NAME LAST*
- ADDRESS
  - *Customer address for confirmation if phone number used to contact customer is different than the one in the sample file/tracking system (when call rescheduled)*
- PHONE NUMBER
  - *(Primary; use Phone\_Number\_Secondary if unable to contact primary # after 4 attempts)*
- AUDIT\_DATE
  - *date audit performed (ex. July 1, 2011)*
- AFEE
  - *Audit fee paid by customer; if 1=\$99, if 2=\$49*
- C\_FLAG
  - *this was flagged if MEASURE ID = 1 OR 2 OR 3 OR 4 OR 19 installed (0,1)*
- SH\_FLAG
  - *this was flagged if MEASURE ID = 5 OR 20 installed (0,1)*
- KA\_FLAG
  - *this was flagged if MEASURE ID = 6 installed (0,1)*
- BA\_FLAG
  - *this was flagged if MEASURE ID = 7 installed (0,1)*
- HWT\_FLAG
  - *this was flagged if MEASURE ID = 8 installed (0,1)*
- PI\_FLAG
  - *this was flagged if MEASURE ID = 9 installed (0,1)*
- PT\_FLAG
  - *this was flagged if MEASURE ID = 10 installed (0,1)*
- PTE\_FLAG
  - *this was flagged if MEASURE ID = 11 installed (0,1)*

Measure ID Codes	
MEASURE_ID	MEASURE_ID_NAME
1	9 Watt CFL
2	14 Watt CFL
3	19 Watt CFL
4	23 Watt CFL
5	Shower Head
<u>6</u>	<u><i>Kitchen Aerator</i></u>
7	Bathroom Aerator
<u>8</u>	<u><i>Hot Water Temperature Setback</i></u>
9	Pipe Insulation
10	Programmable Thermostat
11	Programmable Thermostat Education
19	9 Watt Globe CFL
20	Showerhead Handheld

**Note: italicized and underlined entries above indicate non-key measures -those contributing <5% of DI or weatherization measures' total savings- that were omitted in spillover questions where applicable (but not installation and persistence rate questions).**

**INTERVIEWER INSTRUCTIONS**

Call is to be placed asking to speak to the individual named in the customer contact information obtained from program records.

If that individual no longer has the phone number of record, ask the respondent if they live at [customer address of record].

If the individual of record no longer lives at address of record thank and terminate.

Make at least 5 attempts to each customer at different times of the day/week.

The purpose of the introductory script is to ensure the survey is answered by the primary decision maker involved in enrolling in the Nicor Gas and ComEd Home Energy Savings program and who was present during the home energy assessment (audit).

The program is jointly run by Nicor Gas and ComEd, so the customer will have accounts with both utilities.

Initial questions are to qualify the respondent.

**PROGRAM INTRODUCTION**

Hello, this is [INTERVIEWER'S NAME] from Blackstone Group, calling on behalf of Nicor Gas and ComEd. This is not a sales call. We are contacting customers who have participated in Nicor Gas and ComEd's *Home Energy Savings Program*. May I please speak with [CUSTNAME]? [IF NEEDED: This program provided an on-site home energy assessment (energy audit) and follow-up weatherization actions, including educational information, free installation of energy efficient upgrades such as CFL light bulbs and high-efficiency showerheads and faucet aerators, and incentives for various energy efficiency actions that were installed by a program contractor. I'd like to assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone.]

Were you the person that was at home and present during the home energy assessment (energy audit) and the person most familiar with the work done by the program? (IF NOT: May I please speak with the person who was present during the home energy assessment (energy audit) and who is most familiar with the work done by the program?)

**CONTINUE WITH RIGHT PERSON:** Hello, this is [INTERVIEWER'S NAME] from Blackstone Group, calling on behalf of Nicor Gas and ComEd. This is not a sales call. We are contacting customers who have participated in Nicor Gas and ComEd's *Home Energy Savings Program*. We are conducting a study to evaluate Nicor Gas and ComEd's *Home Energy Savings Program* and would like to include your opinions. [IF NEEDED: This program provided an on-site home energy assessment (energy audit) and follow-up energy saving actions, including educational information, free installation of energy efficient upgrades such as CFL light bulbs and high-efficiency showerheads and faucet aerators, and incentives for various weatherization actions that were installed by a weatherization contractor. I'd like to assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone. This study is required by the Illinois Commerce Commission and will be used to verify the effectiveness of the program and to make improvements.]

(IF NEEDED: It will take about 10 to 15 minutes)

(IF VERIFICATION IS NEEDED: INTERVIEW NOTE: TELL THEM THEY CAN CALL TERRI BURNS OF NICOR GAS AT 630 – 388 – 2380. [IF PROMPTED: TERRI IS AN ADMINISTRATIVE ASSISTANT SERVING THE ENERGY EFFICIENCY DEPARTMENT.]

**CELL PHONE SAFETY**

C1. Are you currently talking to me on a regular landline phone or a cell phone?

1. Regular landline phone
2. Cell phone
98. Don't Know
99. Refused

**[ASK IF C1= 2]**

C2. Are you currently in a place where you can talk safely and answer my questions?

1. Yes
2. No, schedule a callback
3. No, do not call back
98. Don't know, schedule a callback
99. Refused, schedule a callback

**PARTICIPANT TYPE VERIFICATION**

V1. Our records indicate that you received a home energy assessment through Nicor Gas and ComEd's Home Energy Savings program, where an Energy Advisor identified opportunities to improve the energy efficiency of your home. The Energy Advisor may have also installed some efficient items for you that day such as CFLs, faucet aerators, and pipe insulation. However, after the home energy assessment, you did not have additional recommended weatherization upgrades installed through the program such as air sealing and wall insulation. Is that correct?

1. (Yes) **[CONTINUE]**
2. (No, I did not have a home energy assessment) **[NOTE AND TERMINATE]**
3. (No, I had a home energy assessment and also did the follow-up energy efficiency work through the program) **[NOTE AND TERMINATE]**
4. (I had a home energy assessment through the program but I then installed the recommended energy efficiency upgrades outside of the program on my own or through my own contractor) **[CONTINUE]**
98. (Don't know) **[TERMINATE]**
99. (Refused) **[TERMINATE]**

*To start, we have several questions regarding the energy efficiency products that were installed in your home. The answers to these questions are very important so Nicor Gas and ComEd can determine how much energy is being saved by the program.*



**DIRECT INSTALL MEASURE INSTALLATION VERIFICATION AND SPILLOVER**

Our records show that the following instant upgrades were installed through the *Home Energy Savings Program* during the initial energy assessment (energy audit) done at the home. [[READ EACH INSTANT UPGRADE PER PROGRAM RECORD AND VERIFY WITH CUSTOMER:](#)] Is this correct?

- DIMV1. [IF C\_FLAG=1] CFLs
- DIMV2. [if SH\_FLAG=1] Efficient Showerhead
- DIMV3. [if BA\_FLAG=1] Bathroom Faucet Aerator(s)
- DIMV4. [if PI\_FLAG=1] Pipe Insulation
- DIMV5. [if PT\_FLAG=1] A Programmable Thermostat
- DIMV6. [if PTE\_FLAG=1] Programmable Thermostat Temperature Setting and Programming
- DIMV7. [if KA\_FLAG=1] Kitchen Faucet Aerator(s)
- DIMV8. [if HWT\_FLAG=1] Hot Water Heater Temperature Setback

- 1. (Yes, upgrade was installed/action taken)
- 2. (No, upgrade was not installed/action not taken)
- 98. (Don't know)
- 99. (Refused)

**[IF RESPONDENT STATES NO DIRECT INSTALL UPGRADES WERE INSTALLED WHATSOEVER, SKIP TO PP1]**

DIM21. Since receiving the instant upgrades we just discussed through the program, have you installed any more on your own?

- 1. Yes
- 2. No
- 98. (Don't know)
- 99. (Refused)

**[ASK IF DIM21 =1, OTHERWISE SKIP TO PP1]**

DIM21a. What did you install? [[MULTIPLE ANSWERS](#)]

- 1. CFLs
- 2. Efficient Showerhead
- 3. Pipe Insulation
- 4. Bathroom Aerator
- 5. Kitchen Aerator
- 98. (Don't Know)
- 99. (Refused)

**[ASK DIM22 and DIM23 FOR EACH DIM21a=1, 2, 3, 4, 5; IF 98 or 99, SKIP TO PP1]**

DIM22. How many [IF DIM21a = 2, "How many feet of..."] additional [INSERT MEASURE DIM21a] have you installed?

**NUMERIC OPEN END up to 997**

- 998. (Don't know)
- 999. (Refused)

DIM23. How influential was the program in encouraging you to install the additional [INSERT MEASURE DIM21a]? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

**NUMERIC OPEN END from 0 to 10**

- 98. (Don't know)
- 99. (Refused)

**WEATHERIZATION MEASURE SELF-INSTALL SPILLOVER**

PP1. After completing the home energy assessment through the program and receiving energy efficiency recommendations, did you do any wall insulation, attic insulation, air sealing, or other energy efficiency work on your own outside of the program to make your home more energy efficient? -this includes paying someone outside of the program to do the work.

- 1. Yes [SKIP TO PP1a]
- 2. No [CONTINUE TO PP1Na]
- 98. (Don't know) [SKIP TO P1]
- 99. (Refused) [SKIP TO P1]

**[ASK PP1Na-PP1Nd IF PP1=2]**

PP1Na. Why did you decide to not install the recommended energy efficiency upgrades on your own or through the program?

**[RECORD VERBATIM]**

- 98. (Don't know)
- 99. (Refused)

PP1Nb. Do you still plan to do the recommended energy efficiency work in the future even though you haven't gotten around to it yet?

- 1. Yes
- 2. No
- 98. (Don't know)
- 99. (Refused)

**[ASK PP1Nc IF PP1Nb=1]**

PP1Nc. When do you think you will do the recommended energy efficiency work? **[DO NOT READ LIST]**

1. (WITHIN THE NEXT 6 MONTHS)
2. (WITHIN 6 MONTHS TO A YEAR)
3. (1-2 YEARS FROM NOW)
4. (2 OR MORE YEARS FROM NOW)
98. (DON'T KNOW)
99. (REFUSED)

PP1Nd. Is there anything the program can do to help you follow-through and install the energy efficiency upgrades that were recommended to you after your home energy assessment (audit)?

**[RECORD VERBATIM]**

98. (Don't know)
99. (Refused)

**[ASK IF PP1=1]**

PP1a. What additional insulation or air sealing work did you have done after participating in the program? **[MULTIPLE RESPONSES]**

1. Air Sealing
2. Wall insulation
3. Attic Insulation
4. Other Insulation **[RECORD VERBATIM]**
98. (Don't know)
99. (Refused)

**[IF PP1a=1,2,3, 4 ASK PP1b FOR EACH CHECK ABOVE BEFORE CONTINUING TO PP1c, OTHERWISE, SKIP TO P1]**

PP1b. How influential was your participation in the program in encouraging you to install the additional **[INSERT MEASURE PP1a]**? Please rate this on a 0-10 scale, where 0 means not at all influential and 10 means very influential.

**NUMERIC OPEN END from 0 to 10**

98. (Don't know)
99. (Refused)

PP1c. Why did you decide to do the work on your own without participating in the program and receiving the program's rebate money? [**ACCEPT MULTIPLE RESPONSES**]

1. (More time-consuming to perform the work through the program)
2. (Program is more expensive)
3. (Program doesn't offer the measure)
4. (I wanted to use my own contractor)
5. (I wanted to do the work myself)
6. Other [**RECORD VERBATIM**]
98. (Don't know)
99. (Refused)

## PROCESS QUESTIONS

### Marketing and Outreach

P1. Which best describes you?

1. Before learning about the Home Energy Savings program, I did not think about energy efficiency changes in my home.
2. Before learning about the Home Energy Savings program, I thought about energy efficiency changes in my home, but did not do anything.
3. Before learning about the Home Energy Savings program, I already made some changes in my home to save energy.
4. Before learning about the Home Energy Savings program, I already made major changes in my home to save energy.
98. Don't Know
99. Refused

P2. How did you *first* hear about the Home Energy Savings program? [**DO NOT READ LIST**]

1. (BROCHURE/FLYER THROUGH DIRECT MAIL)
2. (INTERNET)
3. (CUSTOMER CALLED COMED TO ASK ABOUT REDUCING ENERGY BILL)
4. (COMED REPRESENTATIVE – OTHER)
5. (CUSTOMER CALLED NICOR TO ASK ABOUT REDUCING ENERGY BILL)
6. (NICOR REPRESENTATIVE – OTHER)
7. (WORD-OF-MOUTH)
8. (CONTRACTOR REFERRAL)
9. (COMMUNITY EVENT)
10. (E12 HOUSE PARTY)
97. (OTHER, SPECIFY)
98. (DON'T KNOW)
99. (REFUSED)

P3. Before participating, did you have any concerns or skepticism about the program and its offerings?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

**[SKIP P4 IF P2=8]**

P4. Did you reach out to the program to participate because the contractor that ultimately did your work recommended it to you?

1. Yes
2. No
98. (Don't know)
99. (Refused)

**[IF E12P=1 ASK P5-P6a]**

P5. Where you a host for an informational house party where a contractor and program staff presented information on the program?

1. Yes
2. No
98. (Don't know)
99. (Refused)

P6. On a scale of 0-10, where 10 is very influential, how influential was the house party informational session in encouraging you to participate in the program?

**[RECORD SCORE 0-10]**

98. (Don't know)
99. (Refused)

**[IF P6 > 4, ASK P6a]**

P6a. What made the house party informational session influential in encouraging you to participate in the program?

**[DO NOT READ, ACCEPT MULTIPLE RESPONSES]**

1. (UNDERSTANDING THE EXTENT OF THE WORK THE PROGRAM WOULD INVOLVE)
2. (IT WAS FREE)
3. (OVERCOMING SKEPTICISM ABOUT PROGRAM)

4. (LEARNING ABOUT THE INCENTIVES AVAILABLE THROUGH THE PROGRAM)
  5. (THIS WAS THE FIRST TIME I HEARD ABOUT THE PROGRAM)
  6. (LEARNING ABOUT THE MONEY SAVING AND COMFORT BENEFITS OF CONDUCTING ENERGY EFFICIENCY WORK)
  7. (RECEIVING PROGRAM LITERATURE AND WAYS TO FIND OUT MORE INFORMATION ABOUT THE PROGRAM)
  8. (INFLUENCE FROM SEEING POSITIVE REACTION TO THE PROGRAM FROM FRIENDS/NEIGHBORS/OTHER ATTENDEES – INCLUDING )
  9. (MEETING THE CONTRACTOR THAT WOULD DO THE WORK ON OUR HOME)
- 97OTHER: **[RECORD VERBATIM]**
98. (DON'T KNOW)
  99. (REFUSED)

P7. What were your main considerations before deciding to follow-through with energy efficiency work on your home through the program after having had a home energy assessment?

**[DO NOT READ, ACCEPT MULTIPLE RESPONSES]**

1. (Financial planning/affording the work/cost of the work)
2. (Finding a convenient time to do the work)
3. (Shopping around for better prices or other incentive opportunities)
4. (Waiting to see how a friend/other participant's work turned out and their satisfaction)
97. (Other, specify)
98. (Don't know)
99. (Refused)

### **PRE-ASSESSMENT EE COMMITMENT, KNOWLEDGE, AND ASSESSMENT PRICING**

P8a. Thinking back to when you signed up for the home energy assessment, on a scale of 0 to 10, where 10 means very committed, how committed were you to doing some sort of energy efficiency work on your home?

**[RECORD SCORE 0-10]**

98. (Don't know)
99. (Refused)

P8b. On a scale of 0 to 10, where 10 is very knowledgeable, how knowledgeable were you about the energy efficiency work that could be done on your home prior to participating in a home energy assessment?

**[RECORD SCORE 0-10]**

98. (Don't know)

99. (Refused)

**[ASK IF AFEE=2, OTHERWISE SKIP TO P8cc]**

P8ca. Looking back to the home energy assessment and the value it provided you, would you have been willing to pay \$75 for the assessment?

1. Yes
2. No
98. (Don't know)
99. (Refused)

P8cb. Would you have been willing to pay \$99 for the assessment?

1. Yes
2. No
98. (Don't know)
99. (Refused)

P8cc **[IF AFEE=1, "Looking back to the home energy assessment and the value it provided you"]** would you have been willing to pay \$150 for the assessment?

1. Yes
2. No
98. (Don't know)
99. (Refused)

P8cd. How about \$200?

1. Yes
2. No
98. (Don't know)
99. (Refused)

P8ce. What is the most you would have paid for the assessment?

**[RECORD DOLLAR AMOUNT]**

98. (Don't know)
99. (Refused)

**SATISFACTION**

SA1. On a scale of 0 to 10, where 0 is very dissatisfied and 10 is very satisfied, how would you rate your satisfaction with... **[SCALE 0-10; 96=not applicable, 98=Don't know, 99=Refused][ROTATE ITEMS]**

- a. The process to sign up for the program



- b. The time it took to schedule the Home Energy Savings program assessment (energy audit)?
- c. The representative that visited your home to conduct the home energy assessment (energy audit)?
- d. Information you received about the program
- e. **[IF EI2P=1]** The House Party program informational session you attended
- f. The Home Energy Savings program overall?

**[ASK SA2 IF ANY SA1<=4]**

SA2. What are the reasons for your dissatisfaction with any aspect of the program?

**RECORD VERBATIM- OPEN END**

98. (Don't know)
99. (Refused)

SA3. How could the program be improved, if at all, from your perspective?

**RECORD VERBATIM- OPEN END**

98. (Don't know)
99. (Refused)

**DEMOGRAPHIC QUESTIONS**

D1. In order to help us understand our survey findings factoring in customer age ranges, would you please tell me your age range from the following list? **[READ LIST]**

1. 18-30
2. 31-40
3. 41-50
4. 51-60
5. 61-70
6. 71-80
7. 80+
98. [DON'T KNOW/NOT SURE]
99. [REFUSED]

D2. Do you own or rent your home?

1. Own
2. Rent/lease
97. (Other, specify)
98. (Don't know)
99. (Refused)

D3. In order to help us understand our survey findings better, could you please tell us what your income level is? Please stop me when I say the range that includes your total family income in 2012 before taxes.

1. UNDER \$15,000
2. \$15,000 to LESS THAN \$30,000
3. \$30,000 to LESS THAN \$50,000
4. \$50,000 to LESS THAN \$75,000
5. \$75,000 to LESS THAN \$100,000
6. Over \$100,000
98. [DON'T KNOW/NOT SURE]
99. [REFUSED]

#### **CLOSING**

Those are all the questions I have. On behalf of Nicor Gas and ComEd, thank you very much for your time. Your input will be valuable to the program in the future!

**7.4.3 Joint HES PY2 TA Interviews**

**Nicor Gas/ComEd Evaluation  
for the Home Energy Savings Program – PY2/5**

**Trade Ally Interview Guide**

FINAL September 12, 2013

Name of Interviewee: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_ Company: \_\_\_\_\_

Note: Light blue text indicates notes for interviewer.

**Depth Interview Guide – Nicor Gas/ComEd Home Energy Savings Program**

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

**Introduction**

Hi, may I please speak with [NAME]?

My name is \_\_\_ and I’m calling from Navigant Consulting, we are part of the team hired to conduct an evaluation of the Nicor Gas/ComEd Home Energy Savings Program. We’re currently in the process of conducting interviews with the program’s weatherization contractors to help improve our understanding of the program.

Our records show you are a weatherization contractor for the Nicor Gas/ComEd Home Energy Savings Program. May I speak with [PERSON LISTED AS THE PRIMARY CONTACT for the program]? *[WHEN CONTACT PERSON ANSWERS, CONFIRM THAT THIS IS THE PERSON MOST KNOWLEDGEABLE AT THEIR BUSINESS, OR GET ALTERNATE NAME AND ASK TO SPEAK WITH THAT PERSON. RESTART SCRIPT AS APPROPRIATE].*

I’d like to ask for about forty five minutes to an hour of your time to discuss your experience with the program during the past year. The information you provide

will be kept anonymous in our reports. General observations and findings will appear in our final report, but they will not be attributed to any named person or company. Is this a good time to talk? [IF NOT, SCHEDULE A CALL BACK.]

### **Company Background**

1. Can you briefly describe the company you work for and the type of business it conducts? *Potential probing questions:*
  - a. *How many are employed at the company?*
  - b. *Who are your primary business customers?*
2. Can you briefly summarize your personal roles and responsibilities at your company? For how long have you carried these out?

### **Program Influence/Sales Volume Net to Gross**

4. What effect—if any—has the low natural gas prices has on customers' willingness to participating in the program?"  
RECORD VERBATIM - CLARIFY AS NECESSARY  
888. Don't Know  
999. Refused
5. What is your sense of the size of the Do-It-Yourself Market (meaning potential participants installing weatherization measures themselves rather than calling a contractor) in the Chicagoland area? Are you aware of any assessment-only participants that may have pursued the weatherization work on their own rather than through the program?  
RECORD VERBATIM - CLARIFY AS NECESSARY  
888. Don't Know  
999. Refused

### **Baseline**

*I'm going to ask you some questions about your sales of energy-efficient equipment prior to your involvement with the program.*

B1. Prior to your involvement with the Home Energy Savings Program, did your business recommend and conduct attic insulation, air sealing, and wall insulation weatherization work?

1. (Yes, all of these)
2. (Yes, but only conducted some of the above [[RECORD WHICH AND CONTINUE TO B2 IN REFERENCE TO MEASURES THEY DID OFFER](#)])
3. (Did not conduct any of the above weatherization work prior to program participation) – SKIP TO B7
888. (Don't Know) – SKIP TO B7
999. (Refused) – SKIP TO B7

B1a. Prior to your involvement with the program, were you following BPI (Building Performance Institute) standards?

[IF B1= "Yes"]

B2. Again, thinking about work completed **prior to your involvement with the program**, about what percent of potential customers or customer leads actually followed through on implementing the following measures?

RECORD PERCENTAGE FOR EACH APPLICABLE MEASURE TYPE

888. Don't Know
999. Refused

Air Sealing:

Wall Insulation:

Attic Insulation:

Other Insulation:

B3. **Since your involvement in the program**, about what percent of your potential customers or customer leads actually choose to *implement* the following measures I will list? Please think about all your customers *including* participants in the Home Energy Savings Program as well as customers outside of the program.

RECORD PERCENTAGE FOR EACH APPLICABLE MEASURE TYPE

888. Don't Know
999. Refused

Air Sealing:

Wall Insulation:  
Attic Insulation:  
Other Insulation:

B4. Of those customers who implement these weatherization measures, about what percent of them are **not participants** in the Home Energy Savings Program?

RECORD PERCENTAGE FOR EACH APPLICABLE MEASURE TYPE

888. Don't Know  
999. Refused

Air Sealing:  
Wall Insulation:  
Attic Insulation:  
Other Insulation:

B4a. Why aren't they participating in the program?

B5. Using a 0 to 10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, *if the program had not been available*, what is the likelihood that you would have implemented the same number of measures?

ENTER RATING 0 - 10

888. Don't Know  
999. Refused

[IF B5 >5, ASK B5a]

B5a. Can you tell me a little bit more about what factors outside of the program are driving your weatherization work sales? [PROBE TO UNDERSTAND WHY SALES MAY BE HIGHER REGARDLESS OF THE PROGRAM]

RECORD VERBATIM - CLARIFY AS NECESSARY

888. Don't Know  
999. Refused

B6. Has the total number of [air sealing/wall insulation/attic insulation] projects completed per year increased since you started participating in the program? [IF NO TO ALL MEASURES, SKIP TO C1; OTHERWISE CONTINUE FOR MEASURES THAT ARE "YES" - IT MAY BE THE SAME % ESTIMATE FOR ALL MEASURES]

Air Sealing:

Wall Insulation:

Attic Insulation:

Other Insulation:

B7. If yes - do you believe that increase in the number of projects is due to:

- a) An increased volume of potential customer leads?
- b) An increased conversion rate (i.e., more customer leads turn into actual customers doing projects)?
- c) Both of the above?
- d) Another factor (specify: \_\_\_\_\_)

**[IF B7 = A OR C, ASK B8; IF B7 = B OR C, ASK B9]**

B8. Compared to pre-program levels, how much has the volume of customer leads increased for [measure]? *[look for a % increase, if they have trouble providing an estimate explain that a 100% increase would mean that the # of leads has doubled, 50% increase would mean that for every 100 pre-program leads, they have 150 now, etc.]*

Air Sealing:

Wall Insulation:

Attic Insulation:

Other Insulation:

B9. What percentage of customer leads actually implement [measure]? *[this is the during-program conversion rate]*

Air Sealing:

Wall Insulation:

Attic Insulation:

Other Insulation:

### **Project Level Free Ridership**

C1. On a scale of 0 to 10, with 10 being the most influential, how much influence do you think *your and CSG's Energy Advisor (auditor) recommendations and technical assistance* have on your customers' decisions to select which weatherization measures to implement? Is this different for customers that you bring into the program vs. customers generally assigned to you by the program?



ENTER RATING 0 - 10 [Note differences between tagged and generally assigned customers.]

888. Don't Know

999. Refused

C2. On a scale of 0 to 10, with 10 being the most influential, how much influence do you think the *Home Energy Savings program and its incentives* have on your customers' decision to implement weatherization measures?

Is this different for customers that you bring into the program vs. customers generally assigned to you by the program?

ENTER RATING 0 - 10 [Note differences between tagged and generally assigned customers.]

888. Don't Know

999. Refused

C3. What is your best estimate of the percent of energy savings that would have been achieved, even without the program? Is this different for customers that you bring into the program vs. customers generally assigned to you by the program? [IF DIFFERENT, probe for tagged vs not tagged percentages]. [If needed for clarification] "For example, 50% means that half of the savings from the Home Energy Savings Program weatherization measures would have been achieved anyway, even if the program did not exist.]

RECORD PERCENTAGE [Note differences between tagged and generally assigned customers.]

888. Don't Know

999. Refused

### **Program Spillover**

[IF B4 < 3% FOR ALL MEASURES, SKIP TO D4, OTHERWISE CONTINUE TO D0 FOR APPLICABLE MEASURES]

D0. Earlier you had indicated that some of your customers who implement air sealing, attic insulation, and wall insulation weatherization measures do not

participate in the program. Why didn't some of your customers participate in the program?

D1a. Did your experience with the program in any way influence you to install energy efficiency measures to higher standards? [This applies to both program and out-of-program projects]

1. (Yes)
2. (No)
000. Other: (verbatim)
888. Don't Know
999. Refused

If D1a = "Yes" ask D2a – D3a]

D2a. What additional standards did you adopt?

[DO NOT READ LIST, CHECK ALL THAT APPLY, RECORD VERBATIM  
[RECORD VERBATIM]

888. Don't Know
999. Refused

D3a. On a scale of 0 to 10, where 10 is very influential, how influential was the program in encouraging you to install energy efficiency measures to higher standards.

RECORD NUMBER, 0-10

888. Don't Know
999. Refused

D1b. Did your experience with the program in any way influence you to install more energy efficient measures in your work outside of the program beyond what you would have done otherwise? I'm asking specifically about additional measures that did not receive a utility program incentive. [This applies to both program and out-of-program projects]

3. (Yes)
4. (No)
000. Other: (verbatim)
888. Don't Know
999. Refused

[If D1b = "Yes" ask D2b – D3b]

D2b. What additional efficiency measures did you implement?

[DO NOT READ LIST, CHECK ALL THAT APPLY, RECORD VERBATIM  
FOR ANYTHING NOT ON LIST]

1. Pipe Insulation
2. Attic Insulation
3. Air Sealing
4. Wall Insulation
5. Other [SPECIFY, OPEN ENDED]:
  888. Don't Know
  999. Refused

D3b. On a scale of 0 to 10, where 10 is very influential, how influential was the program in encouraging you to install additional high-efficiency measures.

RECORD NUMBER, 0-10

888. Don't Know
999. Refused

### **Non-participant Contractor Program Spillover**

E1. Do you believe that the program with its incentives is putting competitive pressure on the prices that other contractors that are not part of the program are able to charge?

1. (Yes)
2. (No)
000. Other: (verbatim)
888. Don't Know
999. Refused

[If E1 = "yes"]

E1a. [IF YES] Can you tell me what kind of effect the program is having on your competitors' pricing? [POTENTIALLY PROBE ABOUT WHETHER DROPPING PRICES EQUIVALENT TO PROGRAM INCENTIVE OF \$1750]

### **Marketing and Promotion to Customers**

7. What has worked best to attract people to participate in the program? Are there other marketing approaches you think also would be effective?
8. Do you think the program marketing and promotion efforts are reaching the right audience? [If not, why not and how to better target the right audience?]

9. Did you “tag” any participants this year, that is, were you assigned any weatherization work this year due to your direct referrals of customers to the program? How about through presenting at EI2’s informational parties? What was your experience with those approaches to program participation?
10. How were the EI2 Informational (House) Parties? –Probe for feedback on how those worked & ways to improve (including cost reduction opportunities, different approaches to promoting, other?). What do you think will be the effect of EI2 involvement being discontinued (impact on participation rates, depth of participation, etc.)?
11. Have you been involved in any “Reach-back” marketing to increase audit-to-project conversion rate by reaching out to customers previously audited that never took further program action? What was your experience with that effort, if any?

### **Customer Participation**

12. What do you think are some of the reasons for customers not going ahead with weatherization projects, or delaying going ahead with projects? Are there ways to improve conversion success rates and to increase project sizes? Are there any other ways Nicor Gas and ComEd get more customers to participate?
13. Do customers understand the participation process? What improvements can be made?
14. Do you have a sense of whether participants that go through the home assessment understand the reports with recommended efficiency improvements they are given? Are there any ways to improve the recommendation process for them?
15. Do customers complain about any particular aspects of the program? Do customers cancel their participation or drop out of this program? If so, why?
16. Did customers ever ask you to not install something that was in your work order for weatherization measures that could have been installed? What do you do in that situation?
17. Do you see opportunities to include other kinds of efficiency improvements in the program beyond what was available in the last program year?

18. What is your opinion of the program's invoicing and measure installation documentation practices? Are there any areas that you think could use improvement, especially to improve accurate data tracking?

### **Incentives**

19. What is your opinion of the \$1,750 incentive amount that was introduced between June 2012 and June 2013 from the original \$1250 incentive amount—Has the increase led to significantly more, some more, or the same level of interest in the program? What is the right rebate amount in your opinion to drive the most participation in a cost effective manner?
20. Audit discounting – What is the effect of discounting the cost of the program audit (from \$99 to \$49) on audit participation rates, effect on conversion to weatherization projects, and size of projects. Is there a “right” price for audits [did customers say anything about it affecting their decision to participate]?

### **Program Adjustments and Enhancements**

21. Are there elements in design, structure, and/or operation that should be modified to make the program work better (e.g., [incentive levels](#), [eligible equipment](#), etc.)? If so, what would you recommend? Why do you think this change is needed?
22. Have you had any issues installing the program's qualifying products? Please describe any issues that you think need to be addressed to improve the program in any way.
23. Are there strengths in the program that you think could be more fully exploited? [\[IF SO,\]](#) What could be done to better capitalize on the program's strengths?

### **Success and the Future of These Efforts**

24. In your summary opinion, how successful is the program? Why? What are the strengths? What are the weaknesses? Do you have any other comments or suggestions for us?

*Thank you very much for taking the time in assisting us with this evaluation. Your contribution is a very important part of the process.*

*We might follow-up with you by phone later, if additional questions arise. Would that be ok with you?*

**7.5 QAQC Ride-Along Memo**

## Navigant Summary of Nicor/ComEd GPY2/EPY5 HES Program QAQC Ride-Along Finding Notes

Navigant conducted two QAQC ride-alongs with two different CSG QAQC staff (different weatherization contractors, and both a new auditor and an experienced auditor) in order to verify QAQC practices and to determine how CSG's installation and persistence rate data if applicable will be used for PY2 impact calculations.

**Navigant determined that while contractor weatherization work and measures were sufficiently QAQC checked according to and as defined by the program manual, direct install measure installation verification was less consistent and not a priority during the QAQC visit.** This is actually in accordance with the program manual where there appears to be ambiguity as to when DI measures should be checked. The program manual defines two QAQC types: the assessment QAQC, and the contractor QAQC. The assessment QAQC is either done as a ride-along with new auditors, or as part of the contractor QAQC, and emphasizes review of home assessment procedures and/or verification of direct install measure installation. However, given that there is a separate outline in the manual of the contractor QAQC procedures that does not outline direct install measure verification as a priority, it is not immediately clear as to when a contractor QAQC effort should verify DI measures. That is, it's not clear when a contractor QAQC is defined as one where assessment work including DI measures should be reviewed in addition to contractor work verification procedures. As such, DI measure verification appears to not be strongly and clearly emphasized in the post-installation (contractor) QAQC effort both in the program manual, and as observed in Navigant's ride-along.

### **Recommendations:**

- Identify opportunities to clarify when DI measure verification should be happening during post-installation QAQCs (during all inspections? During some inspections- and, if so, during which?).

**The less thorough review of DI measures was evident in Navigant's ride-alongs with post-installation (contractor) QAQCs, which resulted in potential lost opportunities for program improvement.** QAQC staff relied on memory to recall what DI measures were installed in the particular home, and one auditor reported that they do not always check for DI measures. One of the auditors made notes on DI measures, while the other did not during the audit (but may have in the car after the audit). Both auditors found pipe insulation DI measure errors.<sup>1</sup> The first did not seem to make note of it on a form, while the other intended to fix the error before the end of the inspection, but given the other priorities, he forgot and Navigant staff did not see him take note of the error on the forms. These are both examples of the potential for making program improvements that can be lost due to some inconsistencies in defining DI measure verification procedures.

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<sup>1</sup> In the first pipe insulation error, the auditor found that the pipe insulation was installed on the wrong portion of the pipe which made the insulation less effective- it wasn't installed on the first nine feet of pipe. In the second pipe insulation error, the auditor found that the pipe insulation was installed too close to the flue- it should not be within six inches of the flue.



### **Recommendations:**

- Have post-installation QAQC auditors review Direct Install measures against a checklist that is printed and brought on site during QAQC audit. Ensure that auditors track discrepancies such as installation errors and opportunities for education on appropriate forms.
- It appears that given the short time-frame for the QAQC visit, auditors may not have enough time to fill out the various QAQC forms they have; as a result, they may be skipping certain sections. Simplifying the forms may help (or using tablet computers to create time efficiencies, as noted by one of the auditors).

**Navigant will use CSG's installation rate findings data for reporting; however, Navigant will also gauge direct install measure installation rates in the survey to have a comparative reference point (weatherization will be assumed to be 100%, given uninstillation is unlikely).** If we find that there are large (>25%) discrepancies between survey installation rate findings and CSG's reported installation rates for particular measures, there may be opportunity to further verify QAQC procedures for these measures. In particular, we would like to review the programmable thermostat education measure installation rates. Navigant's GPY1/EPY5 survey installation rate findings were very low (about 30-40%) compared to CSG's findings, which may have been due to customer recollection error; however, in discussing the measure with QAQC staff (one of which was an auditor as well), they reported that they either do not do the measure unless they're installing a programmable thermostat (the QAQC staff that's also an auditor said this) and that they wouldn't want to program with an existing programmable thermostat for liability reasons and because of time constraints. One auditor also noted that customer engagement varies, which affects the ability to implement the measure. Thus there appears to be potential for misunderstanding for auditors as to when and how to conduct the measure, as it's intended to be done on homes with a programmable thermostat already existing. Given that it makes up a large portion of therm savings (~20%) in PY2, it is important that we review this measure.

**Navigant will use survey findings to establish persistence rates for both DI and weatherization measures.** CSG conducts QAQC inspections too soon to use findings to establish appropriate persistence rates.

### **Summary of field observations:**

#### Ride-along #1 Summary of Relevant Findings:

- Conducted combustion analyzer and blower door tests and noted findings on QAQC forms
- Auditor noted priority in QAQC checks is doing the combustion analyzer (CAZ) checks and verifying contractor work
- Auditor inspected contractor work quality and gave immediate feedback (contractor was on site)
- Auditor did not have direct install measure list to check against (relied on memory)
- Direct Install measure verification not noted on any forms during time of audit

- Direct Install measure error found (pipe insulation), not noted on forms during audit (auditor said will remember to bring up in future trainings)
- Auditor said that he wouldn't want to reprogram a homeowner's existing programmable thermostats because 1) for liability reasons, and 2) they don't have enough time on the jobs to spend time explaining to a home owner how a programmable thermostat works and how to set it. [May be less familiar with it because they're not auditor staff]

Ride-along #2 Summary of Relevant Findings:

- Conducted combustion analyzer and blower door tests and noted findings on QAQC forms
- Inspected contractor weatherization work quality
- Auditor reports that doesn't check DI measures in every QAQC visit
- Auditor reports that doesn't go through a specific paper-based checklist of DI measures; relies on memory of what was installed upon reviewing EM Home in the car prior to visiting a site. Reports that sometimes asks homeowner if they uninstalled any items
- Auditor reviewed DI measures and took notes on QAQC form
- Auditor found pipe insulation installation error; was going to fix it before leaving but forgot
- Auditor reports that he does not enter information from QAQC form into a tracking system. Reports that if he finds a discrepancy, he makes note in QAQC form and gives it to the Field Manager
- Auditor reports homes are inspected from within a few days of the contractor work to a month or so after; this is too soon to properly gauge persistence
- Auditor reports programmable thermostat education doesn't happen often, isn't done unless programmable thermostat is installed

**7.6 Audit Pricing Data Request Presentation**



ENERGY

# Nicor Gas/ComEd HES GPY2/EPY5 Audit Pricing Analysis

January 27, 2014

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## **Navigant reviewed tracking system data to determine the comparative cost per unit of energy saved between \$99 and \$49 assessment participants to determine which pricing is more cost effective.**

- The analysis included only incentive costs - both utility and EI2 contributions - and the program management fee associated with the conversions, both of which were pulled from the tracking system extract.
- Navigant allocated EI2 incentive funding to Nicor and ComEd based on their comparative MMBTU savings ratio.
- Navigant's analysis excludes fourth quarter assessment participants because their conversions would not all have occurred in the program year.
- Two snapshots of the costs are presented:
  - ✓ Nine months GPY2/EPY5 showing EI2 contributions separately.
  - ✓ DI and weatherization-specific results for GPY2/EPY5.
- All analyses and utility-specific costs assume the current cost allocation between ComEd and Nicor Gas as reflected in the tracking system data.

**In total, the participant \$49 assessments appear more cost effective for both utilities (looking at tracking data costs only), while the \$99 assessment delivers higher conversion rates and higher per participant savings.**

### Nine Months GPY2/EPY5 Overall Assessment Cost Comparison

Participant Audit Cost		\$99	\$49	% Diff
<b>Participation</b>	Participation (Assess-only and Full P)	1419	201	
	Full Participants	571	60	
	Assessment Only	848	141	
	Conversion Rate*	40%	30%	
<b>Costs***</b>	Nicor Cost	\$ 840,386	\$ 104,392	
	ComEd Cost	\$ 180,236	\$ 24,136	
	EI2 Cost Nicor Allocation	\$ 209,463	\$ 11,155	
	EI2 Cost ComEd Allocation	\$ 25,326	\$ 1,490	
	Total Nicor Cost (Nicor + EI2 Allocation)	\$ 1,049,849	\$ 115,548	
	Total ComEd Cost (ComEd + EI2 Allocation)	\$ 205,562	\$ 25,626	
<b>Savings</b>	Therms Saved	179,067	21,617	
	kWh Saved	634,916	84,661	
	Therms Saved per Participant	126.19	107.55	-15%
	kWh Saved per Participant	447.44	421.20	-6%
<b>Costs per Unit of Energy Saved</b>	Nicor \$/Therm	\$ 4.69	\$ 4.83	3%
	ComEd \$/kWh	\$ 0.28	\$ 0.29	0%
	EI2 \$/Therm	\$ 1.17	\$ 0.52	-56%
	EI2 \$/kWh	\$ 0.04	\$ 0.02	-56%
	Nicor \$/Therm with EI2 Allocation	\$ 5.86	\$ 5.35	-9%
	ComEd \$/kWh with EI2 Allocation	\$ 0.32	\$ 0.30	-7%

\*Overall \$99 conversion rate includes some \$99 audits that occurred during the \$49 audit promotion period

\*\*Includes Nicor, Comed, and EI2 Incentive Costs and a Program Management Fee

\*\*\*Incentives and Program Management Fee

**Looking separately at direct install and weatherization costs per therm saved, the assessment/direct install measures cost less per unit saved for \$49 assessments relative to \$99 audits, while weatherization measures cost more.**

**Nine Months GPY2/EPY5 DI and Weatherization by Assessment Cost Comparison**

Participant Audit Cost		\$99	\$49	% Diff
<b>Incentive Costs</b>	DI and Assess Measure Cost Nicor	\$ 172,144	\$ 32,078	
	DI and Assess Measure Cost ComEd	\$ 62,311	\$ 11,375	
	DI and Assess Measure Cost EI2	\$ -	\$ -	
	Weath Measure Cost Nicor	\$ 668,242	\$ 72,314	
	Weath Measure Cost ComEd	\$ 117,925	\$ 12,761	
	Weath Measure Cost EI2	\$ 234,789	\$ 12,645	
	Nicor EI2 Allocation Ratio	0.89	0.88	
	ComEd EI2 Allocation Ratio	0.11	0.12	
	Weath Measure Cost Nicor with EI2 alloc	\$ 877,706	\$ 83,469	
	Weath Measure Cost ComEd with EI2 alloc	\$ 143,251	\$ 14,251	
<b>Savings</b>	DI Measure Savings therms	51,480	8,530	
	DI Measure Savings kwh	438,948	61,387	
	Weath Measure Savings therms	127,588	13,088	
	Weath Measure Savings kwh	195,968	23,274	
	Overall Savings therms	179,067	21,617	
	Overall Savings kWh	634,916	84,661	
	DI Participants	1419	201	
	Avg DI Savings/DI Participant therms	36	42	17%
	Avg DI Savings/DI Participant kWh	309	305	-1%
	Total/Full Participants	1419/571	201/60	
	<b>Avg W Savings/Total and Full Participants - therms</b>	<b>90/223</b>	<b>65/218</b>	<b>-28%/-2%</b>
	<b>Avg W Savings/Total and Full Participants - kWh</b>	<b>138/343</b>	<b>116/388</b>	<b>-16%/13%</b>
<b>Costs per Unit of Energy Saved</b>	<b>DI + Assess \$/DI Therm Savings</b>	<b>\$ 3.34</b>	<b>\$ 3.76</b>	<b>12%</b>
	<b>DI + Assess \$/DI kWh Savings</b>	<b>\$ 0.14</b>	<b>\$ 0.19</b>	<b>31%</b>
	<b>Weath \$/Weath Therm Savings</b>	<b>\$ 6.88</b>	<b>\$ 6.38</b>	<b>-7%</b>
	<b>Weath \$/Weath kWh Savings</b>	<b>\$ 0.73</b>	<b>\$ 0.61</b>	<b>-16%</b>

## **Nine months of GPY2/EPY5 data suggest that promoting the HES program with a \$49 (participant) cost is a cost-effective way to bring participants into the HES program.**

- Promoting the program with a \$49 audit offering will yield additional savings at lower cost than the \$99 price, but deliver fewer conversions with their deeper savings.
- It must be kept in mind that the data are not definitive, and repeating and expanding this analysis may make sense once the program marketing and operations are largely stable.
  - ✓ The data only reflect incentive costs and program management fees and do not include full marketing and implementation costs.
  - ✓ The program was ramping up its delivery and marketing capabilities during this period so other factors than the assessment cost may have influenced the conversion rate differences.
  - ✓ The \$49 audit offering occurred during the summer only, a traditionally low period for this program. Consequently the results could be unrepresentative of year-round results.
  - ✓ EI2 house parties were underway over this period and will not necessarily be active going forward.