Home Energy Savings Impact Evaluation Report

Energy Efficiency Plan Year 2020 (1/1/2020-12/31/2020)

Prepared for:

Nicor Gas

Final

June 9, 2021

Prepared by:

Charles Ampong
Guidehouse

Karl Walter
Guidehouse

Tatjana Gasic
Guidehouse

Submitted to:

Nicor Gas Company
1844 Ferry Road
Naperville, IL 60563

Submitted by:

Guidehouse
150 N. Riverside Plaza, Suite 2100
Chicago, IL 60606

Contact:

Ed Balbis
Partner
561.644.9407
ebalbis@guidehouse.com

Stu Slote
Director
802.526.5113
stu.slote@guidehouse.com

Kevin Grabner
Associate Director
608.616.5805
kevin.grabner@guidehouse.com

Table of Contents

List of Tables

1. Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2020 Home Energy Savings (HES) Program. It presents a summary of the energy impacts for the total program and broken out by relevant measure and program structure details. Appendix A presents the impact analysis methodology. Program year 2020 covers January 1, 2020 through December 31, 2020.

2. Program Description

The HES Program includes an assessment and direct install component jointly implemented by Nicor Gas and ComEd, with Resource Innovations leading the program implementation, and a rebate component for air sealing, insulation and duct sealing work completed by approved contractors. This report focuses on natural gas savings achieved by Nicor Gas program participants. Savings from electric measures are included in a separate evaluation report delivered to ComEd.

The HES Program provides a free home energy assessment performed by an energy advisor. The energy advisor collects information about the home's energy use by examining the heating system (e.g. furnace or boiler), cooling system (air conditioner), water heater, and attic (if accessible). The energy advisor provides a customized report with recommendations identifying additional ways the customer can save energy and money. As part of the energy assessment and when appropriate, the energy advisor installs or sets direct installation (DI) measures. These DI measures include showerheads, faucet aerators for bathrooms and kitchen, hot water pipe insulation, and installing and/or setting a programmable or advanced thermostat. A Virtual Home Assessment (VHA) option was added in 2020 to adapt to COVID restrictions.

In addition to the free home energy assessment and free direct install measures, the HES Program also offers rebates for air sealing, duct sealing, and prescriptive building shell insulation (ASI) measures for eligible homes installed by an approved contractor. Measures include air sealing, attic insulation, duct sealing, basement sidewall, and wall insulation. Air sealing includes sealing gaps and cracks in the wall where air can get in and out. The contractor performs a blower door test to measure the air leakage in the home. For participants to receive the instant discount for attic insulation, they must have air sealing and attic insulation installed at the same time.

The program had 7541 participants in 2020 and completed 7645 projects, as shown Table 2-1. Installed measures were categorized as prescriptive air sealing and insulation (ASI), direct installation (DI) and virtual home assessments (VHA). Prescriptive ASI measures include air sealing, attic insulation, basement sidewall insulation, duct insulation and sealing, and wall insulation measures. Direct install measures include advanced thermostat, hot water (HW) pipe insulation, low flow faucet aerator, low flow showerhead, programmable thermostat, and thermostat education measures. Measures delivered through virtual home assessments include advanced thermostat, hot water (HW) pipe insulation, low flow faucet aerator, low flow showerhead, programmable thermostat, and thermostat education measures. The DI and VHA paths also distributed leave-behind Home Energy Assessment (HEA) Kits, which are comprised of weather stripping, door sweep, and shower timer measures.

Table 2-1. 2020 Volumetric Findings Detail

Participation	ASI	DI	VHA	Total
Participants *	803	6,324	431	7,541
Installed Projects †	805	6,374	465	7,645

* Participants are defined as the number of distinct building premise IDs.
† Installed Projects are defined as the number of distinct project IDs.
Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.

Table 2-2 summarizes the installed measure quantities that are the basis for verified energy savings.

Table 2-2. 2020 Measure Quantities

Program Path	Measure	Quantity Unit	Installed or Distributed Quantity*
ASI	Air Sealing (installed with attic insulation)	Projects	690
ASI	Air Sealing (installed without attic insulation)	Projects	98
ASI	Attic Insulation	Square Feet	861,222
ASI	Basement Sidewall Insulation	Square Feet	9,451
ASI	Duct Insulation and Sealing	Projects	23
ASI	Wall Insulation	Square Feet	64,726
DI	Advanced Thermostat	Each	767
DI	HEA Kit	Each	5,650
DI	HW Pipe Insulation	Linear Feet	9,640
DI	Low Flow Faucet Bathroom Aerator	Each	4,046
DI	Low Flow Faucet Kitchen Aerator	Each	720
DI	Low Flow Showerhead	Each	4,628
DI	Programmable Thermostat	Each	732
DI	Thermostat Education	Each	1,159
VHA	Advanced Thermostat	Each	28
VHA	HEA Kit	Each	436
VHA	HW Pipe Insulation	Linear Feet	2,008
VHA	Low Flow Faucet Bathroom Aerator	Each	610
VHA	Low Flow Faucet Kitchen Aerator	Each	85
VHA	Low Flow Showerhead	Each	571
VHA	Programmable Thermostat	Each	9
VHA	Thermostat Education	Each	3

* The ASI path shows installed quantities. The DI and VHA paths show distributed quantities.
Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.

3. Program Savings Detail

Table 3-1 summarizes the energy savings the Home Energy Savings Program achieved by path in 2020.

Table 3-1. 2020 Annual Energy Savings Summary

Program Path	Measure	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
ASI	Air Sealing (installed with attic insulation)	64,607	72%	46,519	NA‡	46,519
ASI	Air Sealing (installed without attic insulation)	7,838	107%	8,404	0.83	6,975
ASI	Attic Insulation	79,119	100%	79,126	NA‡	79,126
ASI	Basement Sidewall Insulation	1,088	100%	1,088	0.85	925
ASI	Duct Insulation and Sealing	4,029	100%	4,029	0.93	3,747
ASI	Wall Insulation	5,811	117%	6,789	0.85	5,771
ASI Subtotal or Weighted Average		***162,492***	***90%***	***145,955***	***0.98***	***143,063***
DI	Advanced Thermostat	54,699	96%	52,760	NA‡	52,760
DI	HEA Kit	93,062	98%	91,648	0.99	90,731
DI	HW Pipe Insulation	6,401	89%	5,668	0.99	5,611
DI	Bathroom Faucet Aerator	3,594	97%	3,498	1.07	3,743
DI	Kitchen Faucet Aerator	2,059	93%	1,923	1.07	2,058
DI	Low Flow Showerhead	41,282	98%	40,513	1.07	43,349
DI	Programmable Thermostat	46,403	100%	46,321	0.81	37,520
DI	Thermostat Education	73,141	100%	73,223	0.85	62,240
DI Subtotal or Weighted Average		***320,641***	***98%***	***315,553***	***0.94***	***298,012***
VHA	Advanced Thermostat	2,190	96%	2,105	NA‡	2,105
VHA	HEA Kit	7,254	100%	7,254	0.99	7,181
VHA	HW Pipe Insulation	1,070	89%	927	0.99	917
VHA	Bathroom Faucet Aerator	453	97%	440	1.07	471
VHA	Kitchen Faucet Aerator	197	94%	185	1.07	198
VHA	Low Flow Showerhead	4,149	100%	4,136	1.07	4,425
VHA	Programmable Thermostat	555	97%	539	0.81	437
VHA	Thermostat Education	187	100%	187	0.85	159
VHA Subtotal or Weighted Average		***16,055***	***98%***	***15,773***	***1.01***	***15,893***
Total or Weighted Average		**499,188**	**96%**	**477,281**	**0.96**	**456,969**

* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.
† A deemed value. Available on the SAG web site: https://www.ilsag.info/ntg_2020.
‡ The TRM v8.0 (http://www.ilsag.info/technical-reference-manual.html) algorithm is deemed to calculate net savings, so no NTG adjustment is applicable.
Source: Guidehouse evaluation team analysis.

4. Program Savings by Measure

The program includes 13 measures as shown Table 4-1. The HEA Kits, thermostats, showerheads, insulation, and air sealing measures contributed the most savings.

Table 4-1. 2020 Annual Energy Savings by Measure

Program Management	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
ASI	Air Sealing (installed with attic insulation)	64,607	72%	46,519	NA‡	46,519
ASI	Air Sealing (installed without attic insulation)	7,838	107%	8,404	0.83	6,975
ASI	Attic Insulation	79,119	100%	79,126	NA‡	79,126
ASI	Basement Sidewall Insulation	1,088	100%	1,088	0.85	925
ASI	Duct Insulation and Sealing	4,029	100%	4,029	0.93	3,747
ASI	Wall Insulation	5,811	117%	6,789	0.85	5,771
DI & VHA	Advanced Thermostat	56,888	96%	54,865	NA‡	54,865
DI & VHA	HEA Kit	100,316	99%	98,902	0.99	97,913
DI & VHA	HW Pipe Insulation	7,471	88%	6,594	0.99	6,528
DI & VHA	Bathroom Faucet Aerator	4,047	97%	3,938	1.07	4,214
DI & VHA	Kitchen Faucet Aerator	2,257	93%	2,108	1.07	2,256
DI & VHA	Low Flow Showerhead	45,431	98%	44,648	1.07	47,774
DI & VHA	Programmable Thermostat	46,958	100%	46,860	0.81	37,957
DI & VHA	Thermostat Education	73,328	100%	73,410	0.85	62,399
	Total	**499,188**	**96%**	**477,281**	**0.96**	**456,969**

* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.
† A deemed value. Available on the SAG web site: https://www.ilsag.info/ntg_2020.
‡ The TRM v8.0 (*http://www.ilsag.info/technical-reference-manual.html*) algorithm savings is deemed to calculate net savings, so no NTG adjustment is applicable.
Source: Nicor Gas tracking data and Guidehouse evaluation team analysis

5. Impact Analysis Findings and Recommendations

5.1 Impact Parameter Estimates

Table 5-1 shows the unit therm savings and realization rate findings by measure from Guidehouses's review. The realization rate is the ratio of the verified savings to the ex ante savings. Following Table 5-1, we provide findings and recommendations, including discussion of all measures with realization rates above or below 100%. Appendix A provides a description of the impact analysis methodology. Table B-1 in Appendix B shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report.

Table 5-1. Verified Gross Savings Parameters

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Air Sealing (installed with attic insulation)	Project	Varies	Varies	72%	TRM v8.0 - 5.6.1† and PTD*
Air Sealing (installed without attic insulation)	Project	Varies	Varies	107%	TRM v8.0 - 5.6.1 and PTD
Attic Insulation	Square Feet	Varies	Varies	100%	TRM v8.0 - 5.6.5 and PTD
Basement Sidewall Insulation	Square Feet	Varies	Varies	100%	TRM v8.0 - 5.6.2 and PTD
Duct Insulation and Sealing	Project	Varies	Varies	100%	TRM v8.0 - 5.3.4 and PTD
Wall Insulation	Square Feet	Varies	Varies	117%	TRM v8.0 - 5.6.4 and PTD
Advanced Thermostat	Each	Varies	Varies	96%	TRM v8.0 - 5.3.16 and PTD
HEA Kit	Each	Varies	Varies	99%	Evaluation Research and PTD
HW Pipe Insulation	Linear Feet	Varies	Varies	88%	TRM v8.0 - 5.4.1 and PTD
Low Flow Faucet Aerator - Bathroom	Each	Varies	Varies	97%	TRM v8.0 - 5.4.4 and PTD
Low Flow Faucet Aerator - Kitchen	Each	Varies	Varies	93%	TRM v8.0 - 5.4.4 and PTD
Low Flow Showerhead	Each	Varies	Varies	98%	TRM v8.0 - 5.4.5 and PTD
Programmable Thermostat	Each	Varies	Varies	100%	TRM v8.0 - 5.3.11 and PTD
Thermostat Education	Each	Varies	Varies	100%	TRM v8.0 - 5.3.11 and PTD

* Program Tracking Data (PTD) provided by Nicor Gas, extract dated January 28, 2021.
† State of Illinois Technical Reference Manual version 8.0 from http://www.ilsag.info/technical-reference-manual.html.

COVID-19 lockdowns in 2020 prompted ComEd, Nicor Gas, Peoples Gas, and North Shore Gas to pursue virtual assessment and guided self-installation options for their assessment and direct install programs. The TRM does not prescribe in-service rates (ISRs) for measures installed as part of a virtual assessment channel. In order to estimate program savings for 2020, Guidehouse developed custom ISRs for virtual assessment/self-install measures[1]. These measures include showerheads, kitchen and bathroom aerators, and omnidirectional and specialty LEDs. Guidehouse used a weighted average approach to create the custom virtual assessment ISRs by weighting the efficiency kit ISR (as specified in the TRM) by fifty percent and the direct-install ISR by fifty percent.

[1] Guidehouse, *In-Service Rates for CY2020 Single Family Virtual Assessment Measures*, August 20, 2020.

Table 5-2. Virtual Home Assessment In-Service Rates

Measure Category	Prospective Custom ISR for 2020 Single Family Virtual Assessment Measures
Showerheads	0.795
Aerators – Bathroom	0.780
Aerators – Kitchen	0.765
DHW Pipe Insulation	0.780
Omnidirectional LEDs	0.803
Specialty LEDs	0.803

Source: Guidehouse analysis, IL TRM v8.0

5.2 Findings and Recommendations

5.2.1 Thermostats

The verified gross realization rate for the advanced thermostats projects, programmable and thermostat education varied widely, from 0% to 232%, and resulted in an overall realization of 96% for the advanced thermostat, and 100% for the programmable and thermostat education. The evaluation team verified multiple projects that switched or used incorrect household factors for the ex ante values applicable to single family households or multi-family households. In addition to the incorrect household assumption, the evaluation found some advanced thermostat projects where ex ante savings values assumed a manual baseline thermostat when the measure notes data field indicated these were a programmable baseline. The verified savings corrected the household assumptions and used the baseline as described in the measure notes.

Recommendation 1. Ensure household factors and subsequent ex ante savings values are consistent with the reported residential building type for single-family and multi-family.

Recommendation 2. Ensure claimed savings and assumptions are consistent with the baseline description for thermostats as provided in the measure notes field.

The evaluation team identified 36 projects with boiler model numbers indicating a boiler heating system, but the ex ante values assumed a furnace heating system. The evaluation corrected the assumptions to use the Heat Consumption parameter applicable to boilers. We also identified 10 projects with electric heating which instead claim gas savings. We determined that the verified savings for all of these projects should be zero. While Nicor Gas made an effort to only claim one thermostat savings per household in accordance with the Illinois Technical Reference Manual (TRM) v8.0, the evaluation team found three projects which claimed savings for more than one thermostat. We determined that the verified savings for the extra claimed thermostats should be zero.

Recommendation 3. Screen out and do not claim savings for projects installed in electric heating buildings.

Recommendation 4. Update validation procedures to prevent claiming more than one thermostat savings per household.

Recommendation 5. Ensure heating system type and heating consumption inputs are consistent with the model specifications in the tracking database for thermostat savings.

5.2.2 Air Sealing (installed with and without attic insulation)

The overall realization rate for the air sealing with attic insulation measure is 72%. The ex ante savings for 690 projects with this measure were based on the assumption that the attic installation was not installed with air sealing, and therefore used a 1.00 adjustment factor for the "ADJAirSealGasHeat" savings input. The verified savings used a 0.72 adjustment factor according to the TRM v8.0, which resulted in 72% overall gross realization rate.

There were 98 projects that implemented air sealing without attic insulation. The evaluation team verified that 74 of those projects correctly applied the adjustment factor of 1.00 and achieved 100% gross realization rates. The remaining 24 projects applied a 0.72 adjustment factor, which upon correction to a 1.00 adjustment factor produced a 139% gross realization rate. The overall verified gross realization rate for the air sealing without attic insulation measure was 107%.

Recommendation 6. Ensure consistency in the data tracking process for input parameters and ex ante savings calculations for air sealing installed with and without attic installation.

5.2.3 Low Flow Showerhead

Low flow showerheads had a verified gross savings realization rate of 98%. Several of the direct install ex ante unit savings were incorrect (using 8.88 for SF, and 12.23 for MF). Verified unit savings were 8.79 therms/unit (SF) and 11.3 therms/unit (MF). Incorrect classification between single-family versus multi-family households caused some direct install and virtual assessment ex ante values to be adjusted appropriately for the verified savings. We adjusted in service rate (ISR) values from 0.98 to 0.97 for direct install single-family, and adjusted the virtual ISR rounded values of 0.80 to the recommended default value of 0.795. We also adjusted savings for 32 projects identified with electric heating fuel type, and hence set the savings to zero.

Recommendation 7. Use the TRM deemed inputs to calculate ex ante savings, which would produce 8.79 therms per showerhead for single family, instead of using the deemed example calculation value of 8.88 therms from the TRM.

Recommendation 8. Ensure consistency in the application of ISR values.

Recommendation 9. To avoid evaluation savings adjustments, establish quality control procedures to align tracked data inputs for household types and heating fuel types with ex ante savings calculations.

5.2.4 Low Flow Faucet Aerator

The verified gross realization rate for low-flow bathroom faucet aerators is 97%, and for kitchen aerators, the rate is 93%. The bathroom aerator ex ante savings assumed 1.5355 baseline gallons per minute (GPM_base), instead of the deemed 1.53 value, to qualify for applying the 1.07 net to gross ratio. Similarly, the kitchen aerator applied 1.6351 GPM instead of a 1.63 value. Evaluation also corrected inconsistencies for the single-family versus multi-family household factors. We set the savings to zero for the electric heating fuel type.

Recommendation 10. Ensure that the "Measure Name" field, which classifies measure suffix -SF but are found to be installed in multi-family units, have the measure suffix revised to reflect claimed savings with multi-family input assumptions.

Recommendation 11. The aerator and showerhead measures have zero free-ridership applied only when the baseline GPM definition in the TRM is followed. Use the TRM deemed baseline GPMs to qualify for the assumption of zero free ridership in the NTG calculation (1.07 NTG for Nicor Gas).

5.2.5 HW Pipe Insulation (1 ft.)

The pipe insulation measure had a verified gross realization rate of 88%. The measure description in the tracking data is confusing because it produces savings for two types of pipe insulation systems: (1) domestic hot water pipe insulation (DHW) with 8,766 hours of use, and (2) hot water space heating pipe insulation (HW) with climate zone 2 equivalent full load hours (EFLH). The tracking values of the circumference of existing pipe (Cexist = 0.1635 ft) and the new pipe (Cnew = 0.425) do not produce the ex ante savings. During year end evaluation we determined that the Cexist of 0.196 (0.75-inch pipe) and Cnew of 0.425 produced a 100% gross realization rate for the HW measure, and an 87% realization rate for the DHW pipe insulation. We also adjusted savings downward for three projects using a Climate Zone 2 EFLH instead of a Climate Zone 3 EFLH. We adjusted the savings of 16 projects with electric DHW or HW system and set the savings to zero therms.

Recommendation 12. Produce separate measure descriptions for the DHW and HW space heating pipe insulation measures, and track Cexist and Cnew assumptions that are consistent with the ex ante savings for each measure.

5.2.6 Wall Insulation

Guidehouse could not isolate a single cause to explain the realization rate deviating from 100%. Guidehouse identified clusters of realization rates, varying from 111% to 133%. Examples include projects PID-2020.03.10-65009, PID-2020.04.14-68958, and PID-2020.04.28-69261. A potential input variable that may be causing the savings to deviate from 100% could be R_new, and is driven by the insulation material parameters.

Recommendation 13. Review the R_new input and other tracking input assumptions for wall insulation measure to reflect the savings claimed.

5.2.7 Tracking Virtual Home Assessment and Application of In-Service Rates

This report includes 465 distinct projects with various measures missing the In-Service-Rates (ISR). While evaluating savings for these projects, Guidehouse used the recommended ISR values as outlined in the Table 5-3, and as documented in the memo "Single Family Virtual Assessment ISR Memo 2020-08-20", dated August 20, 2020.

Table 5-3. Single-Family Virtual Assessment Custom ISRs

Measure Category	Prospective Custom ISR for CY2020 Single Family Virtual Assessment Measures
Showerheads	0.795
Aerators – Bathroom	0.780
Aerators – Kitchen	0.765
Omnidirectional LEDs	0.780
Specialty LEDs	0.803

Source: Guidehouse analysis

Recommendation 14. For the VHA path, populate the tracking system with the virtual ISRs provided in the evaluator memo dated August 20, 2020, and ensure consistent application to generate ex ante savings.

5.2.8 HEA Kits Savings Estimates

The HEA Kit measures included weather stripping, a door sweep, and a shower timer. The evaluation team identified several instances where the ex ante per unit savings did not match the verified savings based on TRM v8.0. The verified savings per kit are based on several configurations of project information in the tracking data (DHW fuel, space heating system type, household type, and climate zone). Two types of discrepancies resulted in savings adjustments:

- Households with electric DHW and electric space heating systems are not expected to produce gas savings for the kit measures that affect those end uses.
- Many of the ex ante estimates in the tracking data differ from the reported climate zones or household types.

The total ex ante savings is 100,316 therms, and the verified savings is 98,902 therms, producing 99% verified gross realization rate. Table 5-4 shows the verified per unit savings by measure location and system configuration.

Table 5-4. Single-Family HEA Kits Configurations and Savings

Household, Climate Zone, and Systems Configuration	Ex Ante Savings Per Kit	Verified Savings Per Kit	Household Type	HDD Zone	DHW Fuel	Space Heating Fuel
MF, HDD - 1, DHW - Natural Gas, Space Heating - Natural Gas	17.31 or 16.31	16.99	MF	1	Natural Gas	Natural Gas
MF, HDD - 2, DHW - Electric, Space Heating - Natural Gas	16.85 or 15.85	13.01	MF	2	Electric	Natural Gas
MF, HDD - 2, DHW - Natural Gas, Space Heating - Electric	16.85	3.54	MF	2	Natural Gas	Electric
MF, HDD - 2, DHW - Natural Gas, Space Heating - Natural Gas	15.85 or 16.85	16.54	MF	2	Natural Gas	Natural Gas
SF, HDD - 1, DHW - Electric, Space Heating - Electric	17.31	-	SF	1	Electric	Electric
SF, HDD - 1, DHW - Electric, Space Heating - Natural Gas	17.31	13.45	SF	1	Electric	Natural Gas
SF, HDD - 1, DHW - Natural Gas, Space Heating - Natural Gas	17.31 or 16.31	17.16	SF	1	Natural Gas	Natural Gas
SF, HDD - 2, DHW - Electric, Space Heating - Unknown	9.44	12.16	SF	2	Electric	Unknown
SF, HDD - 2, DHW - Electric, Space Heating - Electric	vary from 9.44 to 15.85	-	SF	2	Electric	Electric
SF, HDD - 2, DHW - Electric, Space Heating - Natural Gas	vary from 9.44 to 16.86	13.01	SF	2	Electric	Natural Gas
SF, HDD - 2, DHW - Natural Gas, Space Heating - Electric	15.85 or 16.85	3.71	SF	2	Natural Gas	Electric
SF, HDD - 2, DHW - Natural Gas, Space Heating - Natural Gas	vary from 9.44 to 17.31	16.71	SF	2	Natural Gas	Natural Gas
SF, HDD - 2, DHW - Unknown, Space Heating - Unknown	15.85	15.27	SF	2	Unknown	Unknown
SF, HDD - 3, DHW - Natural Gas, Space Heating - Natural Gas	14.10 or 15.12	15.00	SF	3	Natural Gas	Natural Gas
SF, HDD - 3, DHW - Unknown, Space Heating - Unknown	15.10	13.67	SF	3	Unknown	Unknown

Source: Guidehouse analysis

Recommendation 15. Review the tracking system inputs and the ex ante savings methodology to align ex ante savings with the configurations of inputs in the tracking data (DHW fuel, space heating system type, household type, climate zone). Refer to the verified savings per unit for combinations of measure configurations that are shown in Table 5-4.

Appendix A. Impact Analysis Methodology

Guidehouse calculated gross savings by using the methodologies prescribed in Illinois Technical Reference Manual (TRM) v8.0[2] and the inputs provided in the program tracking data when available.

Guidehouse calculated verified net energy savings by multiplying the verified gross savings estimates by a net-to-gross (NTG) ratio. In 2020, the NTG estimates used to calculate the net verified savings were based on past evaluation research and defined by a consensus process through the Illinois Stakeholder Advisory Group (SAG).

The NTG for the leave-behind HEA Kit was not specifically identified in the deemed 2020 NTG values. Instead of the TRM default NTG of 0.80, we assigned a NTG of 0.99 to those measures, which is the NTG used for other self-installable equipment measures in the program, including boiler pipe insulation and DHW pipe insulation.

[2] State of Illinois Technical Reference Manual version 8.0 from http://www.ilsag.info/technical-reference-manual.html

Appendix B. Program Specific Inputs for the Illinois TRC

Table B-1 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to the evaluation team later. Guidehouse will include annual and lifetime water savings and greenhouse gas reductions in the end of year summary report.

Table B-1. Verified Cost Effectiveness Inputs

Program Path	Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
ASI	Air Sealing (installed without attic insulation)	Project	98	20.0	64,607	46,519	46,519
ASI	Air Sealing (installed with attic insulation)	Project	690	20.0	7,838	8,404	6,975
ASI	Attic Insulation	Square Feet	861,222	20.0	79,119	79,126	79,126
ASI	Basement Sidewall Insulation	Square Feet	9,451	20.0	1,088	1,088	925
ASI	Duct Insulation and Sealing	Project	23	20.0	4,029	4,029	3,747
ASI	Wall Insulation	Square Feet	64,726	20.0	5,811	6,789	5,771
DI & VHA	Advanced Thermostat	Each	795	11.0	56,888	54,865	54,865
DI & VHA	HEA Kit	Each	6,086	16.6	100,316	98,902	97,913
DI & VHA	HW Pipe Insulation	Linear Feet	11,648	15.0	7,471	6,594	6,528
DI & VHA	Bathroom Faucet Aerator	Each	4,656	10.0	4,047	3,938	4,214
DI & VHA	Kitchen Faucet Aerator	Each	805	10.0	2,257	2,108	2,256
DI & VHA	Low Flow Showerhead	Each	5,199	10.0	45,431	44,648	47,774
DI & VHA	Programmable Thermostat	Each	741	8.0	46,958	46,860	37,957
DI & VHA	Thermostat Education	Each	1,162	2.0	73,328	73,410	62,399
Total or Weighted Average				**13.2**	**499,188**	**477,281**	**456,969**

Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.