



# Public Housing Energy Savings Impact Evaluation Report

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

**Prepared for:**

**Nicor Gas**

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**Prepared by:**

Alan Elliott  
Opinion Dynamics

Mallorie Gattie  
Opinion Dynamics

**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  
eбалbis@guidehouse.com

Stu Slote  
Director  
802.526.5113  
stu.slote@guidehouse.com

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

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## 1. Introduction

This report presents impact evaluation results from the Nicor Gas 2020 Public Housing Energy Savings (PHES) Program. It presents a summary of the gas impacts for the total program by measure and program structure details. The appendix presents the impact analysis methodology. Program year 2020 covers January 1, 2020 through December 31, 2020.

## 2. Program Description

The PHES Program works with Public Housing Authorities (PHAs) in ComEd, Nicor Gas, Peoples Gas (PGL), and North Shore Gas (NSG) territories to achieve electric and gas savings. The PHA itself is the program participant, though the residents of the properties are directly affected by the program through in-unit and common area upgrades. Given the COVID-19 pandemic, the program focused on upgrades to common areas to avoid in-unit projects, where the only gas savings opportunities were envelope measures; specifically, attic insulation, air sealing, and room AC covers and gap sealer.

The program had eight participants in 2020 and completed 68 projects as shown in Table 2-1.

**Table 2-1. 2020 Volumetric Findings Detail**

Participation	Total
Participants *	8
Installed Projects †	8
Measure Type	68
Attic Insulation	32
Air Sealing	32
Room AC Cover/Gap Sealer	4

\* Participants are defined by the unique account number variable in the tracking data.

† Installed Projects are defined by unique Project IDs in the tracking data and measure type.

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 Installed Measure Quantities**

Program Category	Program Path	Research Category	Quantity Unit	Installed Quantity
Public	Prescriptive	Attic Insulation	Square Feet	70,547
Public	Prescriptive	Air Sealing	Linear Feet	31,444
Public	Prescriptive	Room AC Cover/Gap Sealer	Each	263

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

### 3. Program Savings Detail

Table 3-1 summarizes the gas savings the Nicor Gas Public Housing Energy Savings Program achieved in 2020.

**Table 3-1. 2020 Annual Gas Savings Summary**

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Prescriptive	18,741	101%	18,898	1.00	18,898
<b>Total or Weighted Average</b>	<b>18,741</b>	<b>101%</b>	<b>18,898</b>	<b>1.00</b>	<b>18,898</b>

\* 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](https://www.ilsag.info/ntg_2020).

Source: Guidehouse evaluation team analysis.

### 4. Program Savings by Measure

The PHES Program includes three measure types as shown in Table 4-1. Air sealing and attic insulation account for the majority (90%) of the program's ex ante gas savings. Table 4-1 summarizes the ex ante and verified gas savings for each measure type offered through the program.

**Table 4-1. 2020 Annual Gas Savings by Measure**

Program Category	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Public	Attic Insulation	3,685	100%	3,685	1.00	3,685
Public	Air Sealing	13,081	100%	13,081	1.00	13,081
Public	Room AC Cover/Gap Sealer	1,975	108%	2,132	1.00	2,132
<b>Total or Weighted Average</b>		<b>18,741</b>	<b>101%</b>	<b>18,898</b>	<b>1.00</b>	<b>18,898</b>

\* 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](https://www.ilsag.info/ntg_2020).

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

## 5. Impact Analysis Findings and Recommendations

### Impact Parameter Estimates

The evaluation team calculated verified gas savings by applying the impact algorithm sources found in the Illinois Statewide Technical Reference Manual v8.0 (TRM v8.0)<sup>1</sup>. The team leveraged program tracking data to inform savings assumptions — for example insulation R-values. For savings calculation inputs not in the tracking data, the evaluation team relied on default assumptions from the TRM v8.0.

Table 5-1 shows the unit therm savings and realization rate findings by measure from our review. The realization rate is the ratio of the verified savings to the ex ante savings. Following the table, 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)
Attic Insulation	Square Feet	0.05	0.05	1.00	Illinois TRM, v8.0†, Section 5.6.5 and Program Tracking Database*
Air Sealing	Linear Feet	0.42	0.42	1.00	Illinois TRM, v8.0†, Section 5.6.1 and PTD
Room AC Cover/Gap Sealer	Each	7.51	8.10	1.08	Illinois TRM, v8.0 errata†, Section 4.4.38 and PTD

\* Program Tracking Data (PTD) provided by Nicor Gas, extract dated January 28, 2021. Additional inputs provided by ComEd tracking data, dated January 30, 2021.

† State of Illinois Technical Reference Manual version 8.0 from <http://www.ilsag.info/technical-reference-manual.html>.

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

**Finding 1.** For all three measure types, the Nicor Gas program tracking data did not include all necessary data to verify savings, such as heating type, building type, pre- and post- R-values, etc. Verified savings calculations relied on data from the ComEd program tracking database for variables excluded from the Nicor Gas program tracking database.

**Recommendation 1.** Include all necessary data in the Nicor Gas program tracking database to carry out gas savings calculations from the TRM v8.0.

**Finding 2.** For project (PID #69339) with Room AC Cover/Gap Sealer measure, the ex ante savings applied full load heating hours from Section 4.4.40 (Gas High Efficiency Single Package Vertical Air Conditioner) from the TRM v8.0, while all other projects relied on full load heating hours from Section 4.4.38 (Covers and Gap Sealers for Room Air Conditioners) per direction from the TRM v8.0, resulting in a slight reduction in verified savings compared with the ex ante savings.

<sup>1</sup> Available on the SAG web site: <http://www.ilsag.info/technical-reference-manual.html>

**Recommendation 2.** For the Room AC Cover/Gap Sealer measure, ensure savings calculations rely on full load heating hours from Section 4.4.38, instead of Section 4.4.40.

**Finding 3.** For project (PID #72784) with Room AC Cover/Gap Sealer measure, the ex ante savings applied assumptions from the TRM v8.0 for Mid-Rise Multifamily buildings. The evaluation team leveraged the Nicor Gas tracking database with the joint ComEd PHES database and identified this project as a High Rise Multifamily building type. With other verified inputs, we calculated higher verified savings compared to the ex ante savings.

**Recommendation 3.** Update savings assumptions so the TRM v8.0 assumptions align with the building type specified in the Nicor Gas program tracking database.

**Finding 4.** For all Room AC Cover/Gap Sealer measures, the program tracking database excludes variables for the terrain and shielding classes needed to perform table lookups in the TRM. The verified savings analysis relied on building type (e.g., mid-rise, high-rise) to establish terrain and shielding classes that align with building conditions.

**Recommendation 4.** Include terrain and shielding class specifications in future program tracking databases.

## Appendix A. Impact Analysis Methodology

The evaluation team calculated gross verified savings for the PHES Program by applying savings algorithms from the Illinois TRM v8.0<sup>2</sup>. The team determined verified gross savings for each program measure by:

- Reviewing the savings algorithm inputs in the measure workbook for agreement with the TRM v8.0 and TRM v8.0 Errata.
- Validating savings algorithms were applied correctly.
- Prioritizing project-specific information to inform savings calculations where the TRM v8.0 advises to use actual values. For variables where project information did not include project-specific actual values, the evaluation team relied on defaults from the TRM v8.0.
- Cross-checking per-unit savings values in the tracking data with the verified values in the measure workbook or in the evaluation team's calculations if the workbook did not agree with the TRM v8.0.
- Multiplying the verified per-unit savings value by the quantity reported in the tracking data.

The evaluation team calculated verified net gas savings by multiplying the verified gross savings estimates by a net-to-gross (NTG) ratio of 1.0. For 2020, the PHES Program's NTG estimate was defined by a consensus process through the Illinois SAG.

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<sup>2</sup> Available on the SAG web site: <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.

**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)
Prescriptive	Attic Insulation	Square Feet	70,547	20.0	3,685	3,685	3,685
Prescriptive	Air Sealing	Linear Feet	31,444	20.0	13,081	13,081	13,081
Prescriptive	Room AC Cover/Gap Sealer	Each	263	5.0	1,975	2,132	2,132
<b>Total or Weighted Average</b>			<b>102,254</b>	<b>20.0</b>	<b>18,741</b>	<b>18,898</b>	<b>18,898</b>

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