



Energy Saving Kits Impact Evaluation Report

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

Prepared for:

**Nicor Gas
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1. Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2020 Energy Saving Kits (ESK) program. It presents a summary of the energy impacts for the total program and broken out by relevant 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 Nicor Gas ESK Program provides hot water and weatherization efficiency measures that reduce customer natural gas consumption. The offering targets customers through direct email, outreach events, targeted emails, and Nicor Gas Energy Efficiency Program website promotions. The kits are free and are available to all Nicor Gas single-family (SF) and multi-family (MF) residential customers upon request. There are three kit versions containing water saving measure combinations (abbreviated Kit 1, Kit 2, and Kit 3). A fourth kit combination (Kit 4) includes weatherization gas space heating reduction measures. The weatherization measures include outlet and switch gasket covers, foam tape weatherstripping, v-seal weatherstripping, a self-adhesive door sweep, and a roll of rope caulk. Table 2-1 describes the composition of the kits. Customers may request one of either Kit 1, Kit 2, or Kit 3 plus up to two of Kit 4.

The program had 22,493 participants in 2020 and distributed 50,130 kits, as shown in Table 2-1.

Table 2-1. 2020 Volumetric Findings Detail

Kit	Quantity Distributed	Measure Composition*
Kit 1	628	1 SH, 2 BA, 1 KA, 1 ST
Kit 1 MF	63	
Kit 2	10,534	2 SH, 2 BA, 1 KA, 1 ST
Kit 2 MF	1,616	
Kit 3	297	1 SH, 1 BA, 1 KA, 1 ST
Kit 3 MF	48	
Kit 4	32,816	12 OSC, 17' FTW, 17' VSW, 1 DS, 30' RC
Kit 4 MF	4,128	
Total	50,130	

* SH = Showerhead, KA = Kitchen Aerator, BA = Bath Aerator, ST = Shower Timer, OSC = Outlet or Switch Cover, FTW = Foam Tape Weatherstrip, VSW = V-Seal Weatherstrip, DS = Door Sweep, RC = Rope Caulk

Source: Nicor Gas tracking data and Guidehouse team analysis.

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

Table 2-2. 2020 Distributed Measure Quantities

Measure	Quantity Unit	Distributed Quantity
Bath Aerator	Each	26,027
Kitchen Aerator	Each	13,186
Showerhead	Each	25,336
Shower Timer	Each	13,186
Outlet Cover	Each	443,328
Foam Tape	Feet	628,048
V-Seal	Feet	628,048
Door Sweep	Each	36,944
Rope Caulk	Feet	1,108,320

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

3. Program Savings Detail

Table 3-1 summarizes the ESK program energy savings by kit and home type. Most 2020 program savings came from single-family and multi-family Kit 4 installations.

Table 3-1. 2020 Annual Energy Savings Summary

Program Path	Ex Ante Gross Savings (Therms) ‡	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Kit 1	10,406	100%	10,406		10,029
Kit 1 MF	1,206	100%	1,206		1,169
Kit 2	253,553	100%	253,553		247,128
Kit 2 MF	46,848	100%	46,848	Aerators = 1.00	45,911
Kit 3	4,749	100%	4,749	Showerheads = 1.00	4,571
Kit 3 MF	868	100%	868	All Other Measures = 0.84	841
Kit 4	1,164,640	100%	1,164,640		978,245
Kit 4 MF	146,503	100%	146,503		123,056
Total or Weighted Average	1,628,773	100%	1,628,773	0.87	1,410,949

* 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.

‡ Gross and net savings reported in the tracking data and in Table 3-1 are claimed at the kit level so savings presented at the measure level in subsequent tables below do not sum exactly to the program total due to rounding differences. Table 3-1 gross savings by kit differs by 67 therms compared with gross savings by measure shown in other tables in the report. Verified net savings by kit differs by 205 therms compared with verified net savings by measure shown in other tables in the report.

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

4. Program Savings by Measure

The program includes nine measure types, as shown in Table 4-1. Weatherization measures (Kit 4) contributed the most 2020 savings, with rope caulk being the largest single measure (400,352 annual therms and 24.5%). V-Seals and Foam tape provided the second most gas savings (265,770 therms each, and 16.3% each).

Table 4-1. 2020 Annual Energy Savings by Measure

Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Bath Aerator	16,792	100%	16,792	1.00	16,792
Kitchen Aerator	68,718	100%	68,718	1.00	68,718
Showerhead	183,496	100%	183,496	1.00	183,496
Shower Timer	48,593	100%	48,593	0.84	40,818
Gaskets	145,021	100%	145,021	0.84	121,818
Foam Tape	265,770	100%	265,770	0.84	223,247
V-Seal	265,770	100%	265,770	0.84	223,247
Door Sweep	234,194	100%	234,194	0.84	196,723
Rope Caulk	400,352	100%	400,352	0.84	336,295
Total or Weighted Average‡	1,628,706	100%	1,628,706	0.87	1,411,154

* 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.

‡ Gross and net ex ante savings are claimed at the kit level, so measure level savings do not sum exactly to the program total due to rounding.
Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.

5. Impact Analysis Findings and Recommendations

The Guidehouse team determined verified gross savings for each measure by conducting a tracking system review. Calculated verified gross savings applied Illinois TRM (TRM) v8.0¹ methodology including inputs and formulas. Appendix A provides a description of the impact analysis methodology. Table C-1 in Appendix C shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report.

The evaluation team's verified gross and net savings calculations use non-rounded input values for per unit therm savings. In contrast, Nicor Gas rounds ex ante per-kit savings to two digits after the decimal point. These rounding differences cause minor differences in total therms for the program (typically less than 0.1%) are not Nicor Gas calculation errors. Table B-1 in Appendix B lists the 2020 per kit deemed savings and NTG values. The per-kit NTG values for water saving kits are a weighted average less than 1.00 and rounded to three digits, because shower timers have a NTG of 0.84, while showerheads and aerators have a NTG of 1.00.

Non-rounded, measure-level verified savings are used for cost effectiveness analysis and annual verified savings summary reporting toward goal attainment.

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

5.1 Impact Parameter Estimates

Table 5-1 shows the reviewed unit therm savings and realization rate findings by measure. The realization rate is the ratio of the verified savings to the ex ante savings. The evaluation team determined that all ex ante savings estimates used by Nicor Gas were consistent with Illinois TRM v8.0 methodology. Measures for Kits 1 – 3 have different unit savings depending on if the customer lives in a single-family (SF) or multi-family (MF) home.

Table 5-1. Verified Gross Savings Parameters

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Bath Aerators SF	Each	0.58	0.58	100%	Illinois TRM, v8.0†, Section 5.4.4 and Nicor Gas Program Tracking Data (PTD*)
Bath Aerators MF	Each	1.05	1.05	100%	Illinois TRM, v8.0, Section 5.4.4 and PTD
Kitchen Aerators SF	Each	5.24	5.24	100%	Illinois TRM, v8.0, Section 5.4.4 and PTD
Kitchen Aerators MF	Each	5.01	5.01	100%	Illinois TRM, v8.0, Section 5.4.4 and PTD
Showerhead x1 SF	Each	6.45	6.45	100%	Illinois TRM, v8.0, Section 5.4.5 and PTD
Showerhead x1 MF	Each	8.48	8.48	100%	Illinois TRM, v8.0, Section 5.4.5 and PTD
Showerhead x2 SF	Each	6.98	6.98	100%	Illinois TRM, v8.0, Section 5.4.5 and PTD
Showerhead x2 MF	Each	9.17	9.17	100%	Illinois TRM, v8.0, Section 5.4.5 and PTD
Shower Timer SF	Each	3.71	3.71	100%	Illinois TRM, v8.0, Section 5.4.9 and PTD
Shower Timer MF	Each	3.54	3.54	100%	Illinois TRM, v8.0, Section 5.4.9 and PTD
Gaskets	Each	0.33	0.33	100%	Illinois TRM, v8.0, Section 5.6.1 and PTD
Foam Tape	Feet	0.42	0.42	100%	Illinois TRM, v8.0, Section 5.6.1 and PTD
V-Seal	Feet	0.42	0.42	100%	Illinois TRM, v8.0, Section 5.6.1 and PTD
Door Sweep	Each	6.34	6.34	100%	Illinois TRM, v8.0, Section 5.6.1 and PTD
Rope Caulk	Feet	0.36	0.36	100%	Illinois TRM, v8.0, Section 5.6.1 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>.

Guidehouse found that the measure level savings calculations were consistent with the algorithms and assumptions outlined in TRM v8.0. Guidehouse did not make any adjustments to the measure or kit level savings, resulting in realization rates of 100% for each measure and kit.

During the wave 1 review, Guidehouse identified 177 cases where it appeared that six kits were distributed to a single customer (denoted by Vendor Project ID). In each case, the program tracking data showed two entries for each customer with different reporting dates. Nicor Gas examined these records and determined that these specific customers had been entered into the tracking system twice. Nicor Gas removed these duplicated records as a result of the wave 1 analysis. Guidehouse confirmed that the final 2020 program data did not contain any duplicated records.

5.2 Other Findings and Recommendations

One Vendor Project ID (NG996EJP2U2U5Y2N) in the final 2020 program tracking data had a total of six kits delivered. Guidehouse examined this record and found that the second set of kits shared a single address in a multi-unit townhouse-style building, so it is plausible a second set of kits was installed in a second unit. The tracking data does not contain a second address to distinguish the units.

Recommendation 1. Work with the program implementer to review the program tracking protocols and ensure that project IDs are tied to unique service addresses. This step will aid with program data quality control and assist the evaluation team in verifying unique program transactions.

Appendix A. Impact Analysis Methodology

Guidehouse determined verified gross savings for each program measure by conducting a tracking system review. Guidehouse checked that measure inputs matched deemed TRM (v8.0)² inputs and validated custom inputs or adjusted, as necessary. To be eligible, an TRM measure must meet the physical, operational, and baseline characteristics as defined in the applicable version of the TRM.³ Verified gross realization rates are calculated by dividing the verified gross savings by the ex ante gross savings.

² Available on the SAG web site: <http://www.ilsag.info/technical-reference-manual.html>

³ Illinois Statewide Technical Reference Manual for Energy Efficiency Version 8.0 from <http://www.ilsag.info/technical-reference-manual.html>

Appendix B. Impact Analysis Supplemental Information

Table B-1 lists the 2020 per-kit rounded deemed savings and NTG values. The NTG values for water saving kits are a weighted average less than 1.00 and rounded to three digits, consisting of shower timers with a NTG of 0.84, and showerheads and aerators with a NTG of 1.00.

Table B-1. 2020 Gross Savings and Net-to-Gross Parameters for Kits

Kit Type	Gross Savings Per Kit	Net Savings Per Kit	Average NTG Per Kit
Kit 1	16.57	15.97	0.964
Kit 1 MF	19.14	18.56	0.970
Kit 2	24.07	23.46	0.975
Kit 2 MF	28.99	28.41	0.980
Kit 3	15.99	15.39	0.963
Kit 3 MF	18.09	17.52	0.969
Kit 4	35.49	29.81	0.840
Kit 4 MF	35.49	29.81	0.840

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

Appendix C. Program Specific Inputs for the Illinois TRC

Table C-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. Non-rounded, measure-level verified savings are used for cost effectiveness analysis and annual verified savings summary reporting toward goal attainment.

Table C-1. Verified Cost Effectiveness Inputs

Program Path	Research Category	Units	Distributed Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Prescriptive	Bath Aerator	Each	26,027	10	16,792	16,792	16,792
Prescriptive	Kitchen Aerator	Each	13,186	10	68,718	68,718	68,718
Prescriptive	Showerhead	Each	25,336	10	183,496	183,496	183,496
Prescriptive	Shower Timer	Each	13,186	2	48,593	48,593	40,818
Prescriptive	Gaskets	Each	443,328	20	145,021	145,021	121,818
Prescriptive	Foam Tape	Feet	628,048	20	265,770	265,770	223,247
Prescriptive	V-Seal	Feet	628,048	20	265,770	265,770	223,247
Prescriptive	Door Sweep	Each	36,944	20	234,194	234,194	196,723
Total or Weighted Average			2,922,423	17	1,628,706	1,628,706	1,411,154

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