Guidehouse

Small Business Impact Evaluation Report

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

Prepared for:

Nicor Gas

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Small Business Impact Evaluation Report

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1. Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2020 Small Business (SB) 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 SB Program is designed to assist qualified Nicor Gas non-residential customers[1] to achieve natural gas energy savings through installation of direct-install (DI) energy efficiency measures and prescriptive and custom incentives offered for select measures. The program targets both private sector and public sector customers. The SB Program is implemented by CLEAResult.

The 2020 program had 430 participants, including 409 in the private sector and 21 in the public sector. These participants completed 479 and 21 projects, respectively, as shown in Table 2-1.

Table 2-1. 2020 Volumetric Summary

Participation	Direct Install	Prescriptive	Custom	Total
Private Sector				
Participants *	45	362	2	409
Installed Projects †	45	432	2	479
Unique Measure Types	8	10	2	20
Public Sector				
Participants *	19	-	2	21
Installed Projects †	19	-	2	21
Unique Measure Types	5	-	2	5

* Participants are defined as unique site addresses
† Installed Projects are defined as unique 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.

[1] The offering is available to small commercial and public sector customers of Nicor Gas territory that use less than 60,000 therms or less of natural gas consumption. Eligible small businesses must be a business owned or operated by an individual or a nonprofit or religious organization. If the business is a franchise, the owner/operator must own fewer than 10 franchise locations. Franchisees owning or operating more than 10 franchise locations will be addressed on a case by case basis for eligibility. For public sector customers the facility must use less than 60,000 therms a year.

Table 2-2. 2020 Installed Measure Quantities

Program Category	Program Path	Measure	Quantity Unit	Installed Quantity
Private	Direct Install	DHW Pipe Insulation	Ln Ft	17
		Faucet Aerator – Bath	Each	146
		Faucet Aerator - Bath Laminar	Each	11
		Faucet Aerator – Kitchen	Each	11
		Salon Sprayer	Each	4
		Commercial Weather Stripping	Ln Ft	7
		Showerheads	Each	105
		Spray Valve (Small Restaurants)	Each	2
	Prescriptive	Boiler Tune Up, Process	Each	91
		Boiler Tune Up, Space Heating	Each	1
		Direct-Fired Space Heater	Each	1
		High Efficiency Boiler	Each	2
		High Efficiency Furnace	Each	50
		Infrared Heaters	Each	15
		Pipe Insulation	Ln Ft	84
		Small Commercial Thermostat	Each	22
		Steam Trap	Each	1,856
		Custom Measures	Each	4
Public	Direct Install	DHW Pipe Insulation	Ln Ft	12
		Faucet Aerator – Bath	Each	49
		Faucet Aerator – Kitchen	Each	23
		Showerheads	Each	25
	Prescriptive	Commercial Weather Stripping	Ln Ft	8

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

3. Savings Summary

Table 3-1 summarizes the energy savings the Small Business Program achieved by path in 2020. The private sector Prescriptive path accounted for nearly 99% of program savings.

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)
Private					
Direct Install	3,809	100%	3,813	0.92	3,509
Prescriptive	1,114,482	100%	1,114,531	0.83	925,060
Custom	6,667	100%	6,667	0.93	6,200
Private Subtotal or Weighted Average	***1,124,958***	***100%***	***1,125,011***	***0.83***	***934,769***
Public					
Direct Install	1,127	100%	1,122	0.92	1,032
Custom	1,296	95%	1,230	0.93	1,144
Public Subtotal or Weighted Average	***2,423***	***97%***	***2,352***	***0.93***	***2,176***
Total or Weighted Average	**1,127,381**	**100%**	**1,127,363**	**0.83**	**936,945**

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

4. Program Savings by Measure

The program includes 20 measures as shown in the following Table 4-1. The steam trap and boiler tune up 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)
	Boiler Tune Up, Process	131,358	100%	131,358	0.83	109,027
	Boiler Tune Up, Space Heating	947	100%	947	0.83	786
	Direct-Fired Space Heater	7,634	100%	7,634	0.83	6,336
	High Efficiency Boiler	1,235	100%	1,235	0.83	1,025
	High Efficiency Furnace	15,073	100%	15,122	0.83	12,551
	Infrared Heaters	6,765	100%	6,765	0.83	5,615
	Pipe Insulation - Dry Cleaner	365	100%	365	0.83	303
	Small Commercial Thermostat	3,459	100%	3,459	0.83	2,871
	Steam Trap	947,646	100%	947,646	0.83	786,546
Private	Commercial Weather Stripping	74	100%	74	0.92	68
	DHW Pipe Insulation	9	101%	9	0.92	9
	Faucet Aerator - Bath	800	100%	800	0.92	736
	Faucet Aerator - Bath Laminar	59	100%	59	0.92	55
	Faucet Aerator - Kitchen	75	100%	75	0.92	69
	Salon Sprayer	409	100%	409	0.92	377
	Showerheads	2,268	100%	2,272	0.92	2,090
	Spray Valve (Small Restaurants)	115	100%	115	0.92	105
	Custom - Boiler Replacement	2,310	100%	2,310	0.93	2,148
	Custom - HVAC Controls	4,357	100%	4,357	0.93	4,052
Private Subtotal or Weighted Average		***1,124,958***	***100%***	***1,125,011***	***0.83***	***934,769***
	Commercial Weather Stripping	83	100%	83	0.92	76
	DHW Pipe Insulation	13	52%	7	0.92	6
	Faucet Aerator - Bath	336	100%	336	0.92	309
Public	Faucet Aerator - Kitchen	156	100%	156	0.92	143
	Showerheads	540	100%	541	0.92	498
	Custom - RTUs	832	92%	766	0.93	712
	Custom - RTU BAS	464	100%	464	0.93	432
Public Subtotal or Weighted Average		***2,423***	***97%***	***2,352***	***0.93***	***2,176***
Total or Weighted Average		**1,127,381**	**100%**	**1,127,363**	**0.83**	**936,945**

* 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.
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 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. 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)*
Boiler Tune Up, Process	Each	vary	vary	100%	TRM v8.0†, 4.4.3
Boiler Tune Up, Space Heating	Each	947.2	947.2	100%	TRM v8.0, 4.4.2
Commercial Weather Stripping	Ln Ft	vary	vary	100%	TRM v8.0 4.8.16
DHW Pipe Insulation	Ln Ft	0.55 or 1.06	0.55	100% / 52%	TRM v8.0, 5.4.1
Direct-Fired Space Heater	Each	7,634	7,634	100%	TRM v8.0, 4.4.39
Faucet Aerator - Bath	Each	vary	vary	100%	TRM v8.0, 4.3.2
Faucet Aerator - Bath Laminar	Each	5.4	5.4	100%	TRM v8.0, 4.3.2
Faucet Aerator - Kitchen	Each	vary	vary	100%	TRM v8.0, 4.3.2
High Efficiency Boiler	Each	vary	vary	100%	TRM v8.0, 4.4.10
High Efficiency Furnace	Each	vary	vary	100%	TRM v8.0, 4.4.11
Infrared Heaters	Each	451.0	451.0	100%	TRM v8.0, 4.4.12
Pipe Insulation - Dry Cleaner	Ln Ft	4.4	4.4	100%	TRM v8.0, 4.4.14
Salon Sprayer	Each	102.3	102.3	100%	TRM v8.0, 4.2.11
Showerheads	Each	21.3	21.3	100%	TRM v8.0, 4.3.3
Small Commercial Thermostat	Each	vary	vary	100%	TRM v8, 4.4.48
Spray Valve (Small Restaurants)	Each	57.3	57.3	100%	TRM v8.0, 4.2.11
Steam Traps	Each	vary	vary	100%	TRM v8.0, 4.4.16
Custom	Each	vary	vary	vary	Project File Review, Monthly Billing Data, Phone Interviews‡

* 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.
‡ Project files and monthly billing data provided by Nicor Gas. Where conducted, telephone interview data collected by Guidehouse.

5.1.1 High Efficiency Furnace

All the high efficiency furnace measures had a verified gross realization rate of 100%, except project PRJ-2541354, which had a realization rate of 108%. This project was installed in the colder climate zone 1, but the ex ante savings used warmer climate zone 2.

Recommendation 1. Map project site building type savings calculations consistently with the TRM climate zone values.

5.1.2 DHW Pipe Insulation

All the DHW pipe insulation measures have a verified gross realization rate of 100%, except two projects, PRJ-2626910 and PRJ-2645276, which are public sector projects. The evaluation team did not find any difference between the savings inputs for private or public projects, as provided in the tracking data. The ex ante savings for the public projects do not match the TRM v8.0, resulting in a realization rate of 52%. The overall measure gross realization rate is 72%.

Recommendation 2. Apply the correct algorithms and savings inputs consistently across all projects.

5.2 Custom Projects

Table 5-2 summarizes the results of evaluation verification on custom projects from 2020. Key findings and recommendations follow the table.

Table 5-2. Details of Custom Measures

Project ID	Measure	Ex Ante Gross Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTG	Verified Net Savings (Therms)
NG-18-026	Boiler Replacement	2,310	100%	2,310	0.93	2,148
NG-20-14	HVAC Controls	4,357	100%	4,357	0.93	4,052
NGPS-20-04	RTUs	832	92%	766	0.93	712
NGPS-20-48	RTU BAS	464	100%	464	0.93	432
Total or Weighted Average		**7,963**	**99%**	**7,897**	**0.93**	**7,344**

Source: Nicor Gas tracking data and Guidehouse team analysis.

5.2.1 NGPS-20-04 - RTUs

Custom project NGPS-20-04 is a rooftop unit (RTU) replacement with demand control ventilation and upgraded thermostats. The improvement affected only a portion of the building (estimated by the implementer to be 7,250 ft^2 (36%) of the total 20,000 ft^2 area). The ex ante thermostat savings calculation used a TRM algorithm and an adjustment factor of 0.8 to calculate usage of the affected rooftop units.[2] The evaluation team verified this usage value by

[2] From ex ante calculation file: “Reduction factor of 80% has been used in order to adjust the total natural gas consumption of the rooftop unit with the actual natural gas billing consumption”

applying the percentage of area affected by the gas space heating usage. This resulted in a realization rate of 92% for the project.

Recommendation 3. When available, use site-specific data for energy saving calculation approaches in custom projects.

Appendix A. Impact Analysis Methodology

Guidehouse determined verified gross savings for each program measure by conducting a tracking system data review. Guidehouse used the Illinois Technical Reference Manual (TRM) version 8.0[3] methodology to calculate verified gross savings or relied on custom inputs as provided in the tracking database.

Engineering Review of Project Files

For each selected project, an in-depth application review is performed to assess the engineering methods, parameters and assumptions used to generate all ex ante impact estimates. The verified savings were based on review of documentation and engineering analysis.

To support this review, the implementation contractor provided project documentation in electronic format for each. Documentation included some or all scanned files of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), pre-inspection reports and photos, post inspection reports and photos, and calculation spreadsheets.

[3] 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)
Private	Boiler Tune Up, Process	Each	91	3.0	131,358	131,358	109,027
	Steam Traps	Each	1,856	6.0	947,646	947,646	786,546
	Boiler Tune Up, Space Heating	Each	1	3.0	947	947	786
	High Efficiency Boiler	Each	2	25.0	1,235	1,235	1,025
	High Efficiency Furnace	Each	50	16.5	15,073	15,122	12,551
	Infrared Heaters	Each	15	12.0	6,765	6,765	5,615
	Pipe Insulation - Dry Cleaner	Ln Ft	84	15.0	365	365	303
	Commercial Weather Stripping	Ln Ft	7	10.0	74	74	68
	Direct-Fired Space Heater	Each	1	15.0	7,634	7,634	6,336
	Small Commercial Thermostat	Each	22	11.0	3,459	3,459	2,871
	Custom - Boiler Replacement	Each	1	25.0	2,310	2,310	2,148
	Custom – HVAC Controls	Each	1	15.0	4,357	4,357	4,052
	DHW Pipe Insulation	Ln Ft	17	15.0	9	9	9
	Faucet Aerator - Bath	Each	157	20.0	859	859	791
	Faucet Aerator - Kitchen	Each	11	10.0	75	75	69
	Salon Sprayer	Each	4	5.0	409	409	377
	Showerheads	Each	105	10.0	2,268	2,272	2,090
	Spray Valve (Small Restaurants)	Each	2	5.0	115	115	105
Public	Commercial Weather Stripping	Ln Ft	8	10.0	83	83	76
	Custom – RTUs	Each	1	15.0	832	766	712
	Custom – RTU BAS	Each	1	15.0	464	464	432
	DHW Pipe Insulation	Ln Ft	12	15.0	13	7	6
	Faucet Aerator - Bath	Each	49	10.0	336	336	309
	Faucet Aerator - Kitchen	Each	23	10.0	156	156	143
	Showerheads	Each	25	10.0	540	541	498
	Total or Weighted Average			**6.0**	**1,127,381**	**1,127,363**	**936,945**

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