

# C&I and Public Sector Prescriptive Program Impact Evaluation Report

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

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Peoples Gas and North Shore Gas Final

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## 1. Introduction

This report presents the results of the impact evaluation of the Peoples Gas (PGL) and North Shore Gas (NSG) 2020 Prescriptive Program for commercial and industrial (C&I) and public sector customers. 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 PGL and NSG comprehensive business programs bundle offerings into program paths and allow eligible C&I and public sector customers access to any of the paths<sup>1</sup> based on the needs of each customer. This report covers evaluation activities for measures installed and natural gas savings realized through the Prescriptive Rebate path, referred to as the Prescriptive Program in this report. This path provides standardized incentives to cover part of measure costs for existing commercial, industrial, and public sector buildings. The incentives focus on energy efficient measures such as heating systems, water heating systems, pipe and storage tank insulation, steam traps, and food service equipment.

Franklin Energy Services LLC. (Franklin Energy) is the implementation contractor for the PGL and NSG program. Franklin Energy engages with trade allies and technical support for program marketing and delivery.

The PGL program had 48 participants in 2020 (37 private and 11 public sector participants) and completed 197 projects (54 private and 143 public projects), as shown in Table 2-1.

<sup>&</sup>lt;sup>1</sup> The comprehensive non-residential sector program paths include – Energy Jumpstart (direct installation of free energy saving products), Engineering Studies and staffing assistance, Prescriptive Rebates, Custom Rebates, and Gas Optimization. Only measures that received prescriptive rebates were implemented in 2020; the 2020 program did not realize savings from the Energy Jumpstart path, which as a direct installation offering was affected by COVID-19 restrictions. The custom and gas optimization projects are evaluated and reported separately.



#### Table 2-1. 2020 Volumetric Summary for PGL

Participation	Total
C&I Sector	
Participants *	37
Installed Projects †	54
Measure Types Installed	11
Public Sector	
Participants *	11
Installed Projects †	143
Measure Types Installed	5
Program 2020 Total	
Participants *	48
Installed Projects †	197
Measure Types Installed	16

\* Participants are defined as the unique number of Account Names

† Installed Projects are defined as the unique number of Project IDs with non-zero therms savings Source: Peoples 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 for PGL

Program Path	Measure	Quantity Unit	Quantity Installed
	Boiler Tune Up - Process	MBH	286,780
	Boiler Tune Up - Space Heating	MBH	360,374
C&I	Prescriptive Change Other*	Each	712
Cal	Prescriptive Change Steam Trap	Projects	7
	Steam Traps - HVAC Repair/Rep	Each	399
	Steam Traps - Industrial Rep	Projects	73
	Boiler Tune Up - Space Heating	MBH	1,700,200
	DCV - Kitchen	HP	40
Public	Prescriptive Change Other†	Each	3,684
	Steam Traps - HVAC Repair/Rep	Each	93
	Storage Water Heater (Large)	MBH	998

\* Program documents show this measure was a steam trap.

† Program documents show this measure was a high efficiency boiler.

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

The NSG program had 20 participants in 2020 and completed 30 projects, as shown in Table 2-3.



#### Table 2-3. 2020 Volumetric Summary for NSG

Participation	Total
C&I Sector	
Participants *	6
Installed Projects †	7
Measure Types Installed	7
Public Sector	
Participants *	14
Installed Projects †	23
Measure Types Installed	17
Program 2020 Total	
Participants *	20
Installed Projects †	30
Measure Types Installed	24

\* Participants are defined as the unique number of Account Names † Installed Projects are defined as the unique number of Project IDs with non-zero therms savings Source: North Shore Gas tracking data and Guidehouse evaluation team analysis.

Table 2-4 summarizes the installed measure quantities that are the basis for verified energy savings.

### Table 2-4. 2020 Installed Measure Quantities for NSG

Program Path	Measure	Quantity Unit	Quantity Installed
	Boiler Tune Up - Space Heating	MBH	56,455
	Dock Door Seals	Each	4
C&I	High Efficiency Boiler	MBH	630
	Steam Traps - HVAC Repair/Rep	Each	152
	Steam Traps - Industrial Rep	Projects	5
	Boiler Tune Up - Process	MBH	339,470
	Boiler Tune Up - Space Heating	MBH	17,000
	Demand Controlled Ventilation	Sq Ft	9,000
Dublic	DHW Storage Tank Insulation	Sq Ft	200
Public	High Efficiency Boiler	MBH	5,900
	Pipe Insulation	Ln Ft.	2,906
	Small Commercial Thermostat	Each	12
	Steam Traps - HVAC Repair/Rep	Each	130

Source: North Shore Gas tracking data and Guidehouse evaluation team analysis.

## 3. Program Savings Detail

Table 3-1 summarizes the energy savings the PGL program achieved by path in 2020.

### Table 3-1. 2020 Annual Energy Savings Summary for PGL

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
C&I	1,398,493	100%	1,398,500	0.79	1,104,815
Public	873,446	100%	873,448	0.79	690,024
Total or Weighted Average	2,271,939	100%	2,271,948	0.79	1,794,839

\* 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 Illinois SAG web site: https://www.ilsag.info/ntg\_2020.

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

#### Table 3-2 summarizes the energy savings the NSG program achieved by path in 2020.

#### Table 3-2. 2020 Annual Energy Savings Summary for NSG

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
C&I	381,959	100%	381,980	0.79	301,764
Public	432,422	100%	432,435	0.79	341,623
Total or Weighted Average	814,381	100%	814,415	0.79	643,387

\* 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 Illinois SAG web site: https://www.ilsag.info/ntg\_2020.

Source: North Shore Gas tracking data and Guidehouse evaluation team analysis.



## 4. Program Savings by Measure

The PGL program includes eight unique measures across the C&I and public sector program paths, as shown in Table 4-1. The Boiler Tune Up and Steam Trap measures contributed the most savings.

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	293,315	100%	293,301	0.79	231,707
	Boiler Tune Up - Space Heating	170,653	100%	170,654	0.79	134,816
C&I	Prescriptive Change Other	712	100%	712	0.79	563
Gal	Prescriptive Change Steam Trap	18,504	100%	18,504	0.79	14,618
	Steam Traps - HVAC Repair/Rep	130,710	100%	130,715	0.79	103,265
	Steam Traps - Industrial Rep	784,599	100%	784,614	0.79	619,845
C&I Subtotal or Weig	ghted Average	1,398,493	100%	1,398,500	0.79	1,104,815
	Boiler Tune Up - Space Heating	805,120	100%	805,123	0.79	636,047
	DCV - Kitchen	30,962	100%	30,960	0.79	24,458
Public	Prescriptive Change Other	3,684	100%	3,684	0.79	2,910
	Steam Traps - HVAC Repair/Rep	30,466	100%	30,467	0.79	24,069
	Storage Water Heater (Large)	3,214	100%	3,214	0.79	2,539
Public Subtotal		873,446	100%	873,448	0.79	690,024
Total or Weighted Av	verage	2,271,939	100%	2,271,948	0.79	1,794,839

### Table 4-1. 2020 Annual Energy Savings by Measure for PGL

\* 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 Illinois SAG web site: https://www.ilsag.info/ntg\_2020.

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

The NSG program includes 10 unique measures across the C&I and public sector program paths, as shown in Table 4-2. The Boiler Tune Up and Steam Trap measures contributed the most savings.



Program Category	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
	Boiler Tune Up - Space Heating	26,734	100%	26,734	0.79	21,120
	Dock Door Seals	940	100%	940	0.79	742
C&I	High Efficiency Boiler	321	100%	321	0.79	254
	Steam Traps - HVAC Repair/Rep	49,794	100%	49,796	0.79	39,339
	Steam Traps - Industrial Rep	304,170	100%	304,189	0.79	240,309
C&I Subtotal or Weigh	ted Average	381,959	100%	381,980	0.79	301,764
	Boiler Tune Up - Process	347,181	100%	347,188	0.79	274,278
	Boiler Tune Up - Space Heating	8,051	100%	8,050	0.79	6,360
	Demand Controlled Ventilation	612	100%	612	0.79	483
Public	DHW Storage Tank Insulation	1,071	100%	1,071	0.79	846
Fublic	High Efficiency Boiler	9,717	100%	9,720	0.79	7,679
	Pipe Insulation	22,288	100%	22,288	0.79	17,607
	Small Commercial Thermostat	1,874	100%	1,873	0.79	1,480
	Steam Traps - HVAC Repair/Rep	41,628	100%	41,632	0.79	32,890
Public Subtotal or We	Public Subtotal or Weighted Average		100%	432,435	0.79	341,623
Total or Weighted Ave	814,381	100%	814,415	0.79	643,387	

### Table 4-2. 2020 Annual Energy Savings by Measure for NSG

\* 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 Illinois SAG web site: https://www.ilsag.info/ntg\_2020.

Source: North Shore Gas tracking data and Guidehouse 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 the evaluation team's 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 other than 100%. Appendix A provides a description of the impact analysis methodology. Appendix B provides 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

Program Path	Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
	Boiler Tune Up - Process	MBH	1.02	1.02	100%	TRM v8.0, Section 4.4.3, PTD*, Evaluation Research
	Boiler Tune Up - Space Heating	MBH	0.47	0.47	100%	TRM v8.0, Section 4.4.2, PTD, Evaluation Research
	Dock Door Seals	Each	234.94	234.95	100%	2020 MMDB‡
	High Efficiency Boiler	MBH	0.51	0.51	100%	TRM v8.0, Section 4.4.10
C&I	Prescriptive Change Other	Each	Custom Calculation	Custom Calculation	100%	TRM v8.0, PTD
	Prescriptive Change Steam Trap	Projects	Custom Calculation	Custom Calculation	100%	TRM v8.0, Section 4.4.16, PTD
	Steam Traps - HVAC Repair/Rep	Each	327.60	327.61	100%	TRM v8.0, Section 4.4.16
	Steam Traps - Industrial Rep	Projects	2,757.12	2,757.17	100%	TRM v8.0, Section 4.4.16
	Boiler Tune Up - Process	MBH	1.02	1.02	100%	TRM v8.0, Section 4.4.3, PTD, Evaluation Research
	Boiler Tune Up - Space Heating	MBH	0.47	0.47	100%	TRM v8.0, Section 4.4.2, PTD, Evaluation Research
	DCV - Kitchen	HP	774.05	774.00	100%	TRM v8.0, Section 4.2.16
	Demand Controlled Ventilation (DCV)	Sq Ft	0.07	0.07	100%	TRM v8.0, Section 4.4.19
	DHW Storage Tank Insulation	Sq Ft	5.35	5.35	100%	2020 MMDB‡
Public	High Efficiency Boiler	MBH	1.62	1.62	100%	TRM v8.0, Section 4.4.10
	Pipe Insulation	Ln Ft.	19.24	19.24	100%	TRM v8.0, Section 4.4.14
	Prescriptive Change Other	Each	Custom Calculation	Custom Calculation	100%	TRM v8.0, PTD
	Small Commercial Thermostat	Each	156.16	156.12	100%	TRM v8.0, Section 4.4.48
	Steam Traps - HVAC Repair/Rep	Each	313.52	313.54	100%	TRM v8.0, Section 4.4.16
	Storage Water Heater (Large)	MBH	3.22	3.22	100%	TRM v8.0, Section 4.3.1

\* Program Tracking Data (PTD) provided by Peoples Gas and North Shore Gas, extracted February 1, 2021.

† State of Illinois Technical Reference Manual version 8.0 from <u>http://www.ilsag.info/technical-reference-manual.html</u>.
 ‡ Custom calculation reviewed by Guidehouse, file name: 2020 MMDB – C&I and SB, produced by Franklin Energy, dated January 23, 2020.

## **5.2 Findings and Recommendations**

### 5.2.1 North Shore Gas, Public Sector

Guidehouse

The evaluation mid-year impact review found that NSG public sector ex-ante calculations used a built-in realization rate of 107% for all measures. The implementer acknowledges that the 107% realization rate value was due to a prior year's evaluation and the measures will contain a realization rate of 100% going forward. The evaluation savings calculations remove the 107% built-in realization rate for 2020 verified savings.

### 5.2.2 Boiler Tune Up Measures

The ex ante per unit savings for the "Boiler Tune Up, Process" and "Boiler Tune Up, Space Heating" measures use the algorithm from TRM v8.0, which specifies custom inputs for boiler efficiencies before and after tune-up. The ex ante savings calculation approach uses average efficiencies based on past program year boiler tune-up reports. For 2020, the evaluation team analyzed a sample of 246 boiler tune-up reports from a population of 610 2018 and 2019 PGL and NSG projects to update the average savings. The resulting average efficiencies were used for both ex ante and verified savings, and were accepted as an update to TRM v9.0.

**Recommendation 1.** For 2021 boiler tune-up ex ante savings, use TRM v9.0 default efficiency values, which are drawn from recent PGL and NSG program data. We acknowledge this is being considered by the implementer for the 2021 program.

## 5.3 Historical Realization Rates and Net-To-Gross (NTG) Values

Table 5-2 shows the historical gross realization rates and NTG values for the C&I Prescriptive Program, beginning in GYP1. Table 5-3 shows the historical gross realization rates and NTG values for the Public Sector Prescriptive Program that began in GPY6 when PGL and NSG assumed administration of the program.

Program Year	PGL Verified Gross RR	NSG Verified Gross RR	PGL NTG	NSG NTG
GPY1 (2011-2012)	100%	100%	0.43	0.43
GPY2 (2012-2015)	100%	100%	0.63	0.63
GPY3 (2013-2014)	100%	100%	0.63	0.63
GPY4 (2014-2015)	100%	100%	0.58	0.58
GPY5 (2015-2016)	99%	100%	0.63	0.63
GPY6 (2016-2017)	100%	100%	0.79	0.79
2018	100%	100%	0.79	0.79
2019	100%	100%	0.79	0.79
2020	100%	100%	0.79	0.79

### Table 5-2. Historical Realization Rates and NTG Values – C&I

Source: Guidehouse evaluation research.



### Table 5-3. Historical Realization Rate and NTG Values – Public Sector

Program Year	PGL Verified Gross RR	NSG Verified Gross RR	PGL NTG	NSG NTG
GPY6 – Prescriptive (2017)	100%	100%	0.46	0.46
GPY6 – STEP (2017)	98%	98%	0.90	0.90
2018	100%	107%	0.79	0.79
2019	100%	101%	0.79	0.79
2020	100%	100%	0.79	0.79

Source: Guidehouse evaluation research.

## Appendix A. Impact Analysis Methodology

Guidehouse determined verified gross savings for each program measure by:

- Reviewing the savings algorithm inputs in the 2020 "Master Measure Database" file (MMDB)<sup>2</sup> for agreement with the Illinois Technical Reference Manual (TRM)<sup>3</sup> v8.0<sup>4</sup> or evaluation research for non-deemed measures or custom inputs.
- 2. Validating that the savings algorithm was applied correctly.
- 3. Cross-checking per-unit savings values in the tracking data with the verified values in the measure workbook or in Guidehouse's calculations if the workbook did not agree with the TRM.
- 4. Multiplying the verified per-unit savings value by the quantity reported in the program tracking data drawn from an extract dated February 1, 2021 to substantiate the type and quantity of measures installed.

Verified gross realization rates are calculated by dividing the verified gross savings by the ex ante gross savings. The evaluation team calculated verified net gas savings by multiplying the verified gross savings estimates by a net-to-gross (NTG) ratio of 0.79, the value deemed by a consensus process through the Illinois SAG.

<sup>&</sup>lt;sup>2</sup> File name: 2020 MMDB – C&I and SB, produced by Franklin Energy, dated January 23, 2020.

<sup>&</sup>lt;sup>3</sup> Because the Illinois TRM provides multiple options for selecting input assumptions, Franklin Energy produces a

<sup>&</sup>quot;Master Measure Database" spreadsheet that documents their approach to compliance with the Illinois TRM.

<sup>&</sup>lt;sup>4</sup> State of Illinois Technical Reference Manual version 8.0 from <u>http://www.ilsag.info/technical-reference-manual.html</u>.

## Appendix B. Program Specific Inputs for the Illinois TRC

Table B-1 and Table B-2 show 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.

Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Boiler Tune Up - Process	MBH	286,780	3.0	293,315	293,301	231,707
Boiler Tune Up - Space Heating	MBH	2,060,574	3.0	975,773	975,777	770,864
DCV - Kitchen	HP	40	15.0	30,962	30,960	24,458
Prescriptive Change Other	Each	4,396	17.7	4,396	4,396	3,473
Prescriptive Change Steam Trap	Projects	18,504	6.0	18,504	18,504	14,618
Steam Traps - HVAC Repair/Rep	Each	492	6.0	161,177	161,183	127,334
Steam Traps - Industrial Rep	Projects	387	6.0	784,599	784,614	619,845
Storage Water Heater (Large)	MBH	998	15.0	3,214	3,214	2,539
Total or Weighted Average		2,372,171	4.5	2,271,939	2,271,948	1,794,839

### Table B-1. Verified Cost Effectiveness Inputs – PGL

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

### Table B-2. Verified Cost Effectiveness Inputs – NSG

Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Boiler Tune Up - Process	MBH	339,470	3.0	347,181	347,188	274,278
Boiler Tune Up - Space Heating	MBH	73,455	3.0	34,784	34,784	27,480
Demand Controlled Ventilation	Sq Ft	9,000	10.0	612	612	483
DHW Storage Tank Insulation	Sq Ft	200	5.0	1,071	1,071	846
Dock Door Seals	Each	4	20.0	940	940	742
High Efficiency Boiler	MBH	6,530	20.0	10,039	10,041	7,933
Pipe Insulation	Ln Ft.	2,906	15.0	22,288	22,288	17,607
Small Commercial Thermostat	Each	12	11.0	1,874	1,873	1,480
Steam Traps - HVAC Repair/Rep	Each	282	6.0	91,423	91,429	72,229
Steam Traps - Industrial Rep	Projects	62	6.0	304,170	304,189	240,309
Total or Weighted Average		431,921	5.0	814,381	814,415	643,387

Source: North Shore Gas tracking data and Guidehouse evaluation team analysis.