



# Home Energy Jumpstart Impact Evaluation Report

**Energy Efficiency Plan: Plan Year 2018  
(1/1/2018-12/31/2018)**

**Presented to  
Peoples Gas and North Shore Gas**

**DRAFT**

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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) 2018 Home Energy Jumpstart (HEJ) Program. It presents a summary of the energy impacts for the total program and broken out by relevant measure and program structure details, for each utility. The appendix presents the impact analysis methodology. The 2018 program covered January 1, 2018 through December 31, 2018.

## 2. PROGRAM DESCRIPTION

The 2018 HEJ Program is an assessment and direct install program jointly implemented by ComEd and Peoples Gas and North Shore Gas (PGL and NSG) with Franklin Energy Services (Franklin Energy) operating as implementer of the program. This report focuses solely on the natural gas savings from the program. Savings from electric measures are included in a separate evaluation report delivered to ComEd.

The HEJ Program seeks to secure energy savings through direct installation of low-cost efficiency measures, such as: water efficient showerheads and faucet aerators, pipe insulation, and programmable thermostats at eligible single-family residences. The program also secures energy savings through installation of smart thermostats with co-pays. In addition, the program performs an assessment of the major retrofit opportunities (e.g., furnace, boiler, air conditioning, insulation, and air sealing) and heightens awareness of the homeowners about available additional efficiency programs offered by ComEd, Peoples Gas and North Shore Gas.

The PGL program reached 4,699 participant homes in 2018 (including those that received an assessment or other program services but did not result in claimed natural gas energy savings) and completed gas energy saving projects at 3,981 unique homes as shown in the following table.

**Table 2-1. 2018 Volumetric Summary for PGL**

Participation	Total
All Participants †	4,699
Participants with Gas Energy Saving Projects ‡	3,981
Total Projects	4,056

† Participants are defined as all unique site addresses with unique telephone numbers, including sites that received an assessment or other program services but did not have natural gas energy savings.

‡ Participants with gas energy saving projects are defined as unique site addresses with unique telephone numbers with claimed natural gas energy savings.

Source: Peoples Gas tracking data (February 4, 2019) and Navigant team analysis.

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

**Table 2-2. 2018 Installed Measure Quantities for PGL**

Measure	Quantity Unit	Installed Quantity	Verified Quantity
Boiler Pipe Insulation	Linear Feet	205	205
Faucet Aerator - Bathroom	Each	1,727	1,727
Faucet Aerator - Kitchen	Each	1,318	1,318
Pipe Insulation - DHW Outlet	Linear Feet	4,613	4,613
Showerhead	Each	3,599	3,599
Advanced Thermostat - Manual Baseline (Condo)	Each	15	15
Advanced Thermostat - Manual Baseline (SF)	Each	128*	127
Advanced Thermostat - Programmable Baseline (Condo)	Each	34	34
Advanced Thermostat - Programmable Baseline (SF)	Each	126	126
Thermostat - Boiler Programmable	Each	145	145
Thermostat - Boiler Reprogram	Each	134	134
Thermostat - Furnace Programmable	Each	815	815
Thermostat - Furnace Reprogram	Each	1175*	1172

\* Note: One household account installed two advanced thermostat and three accounts performed two furnace reprogramming thermostats. Verified savings were allowed for only one thermostat per household as required by the TRM (TRM v6.0).  
 Source: Peoples Gas tracking data (February 4, 2019) and Navigant team analysis.

The NSG program reached 1,671 participant homes in 2018 (including those that received an assessment or other program services but did not result in claimed natural gas energy savings) and completed gas energy saving projects at 1,152 unique homes as shown in the following table.

**Table 2-3. 2018 Volumetric Summary for NSG**

Participation	Total
All Participants †	1,671
Participants with Gas Energy Saving Projects ‡	1,152
Total Projects	1,157

† Participants are defined as all unique site addresses with unique telephone numbers, including sites that received an assessment or other program services but did not have natural gas energy savings.

‡ Participants with energy saving projects are defined as unique site addresses with unique telephone numbers with claimed natural gas energy savings.

Source: North Shore Gas tracking data (February 4, 2019) and Navigant team analysis.

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

**Table 2-4. 2018 Installed Measure Quantities for NSG**

Measure	Quantity Unit	Installed Quantity	Verified Quantity
Boiler Pipe Insulation	Linear Feet	149	149
Faucet Aerator - Bathroom	Each	1,000	1,000
Faucet Aerator - Kitchen	Each	130	130
Pipe Insulation - DHW Outlet	Linear Feet	1,716	1,716
Showerhead	Each	1,295	1,295
Advanced Thermostat - Manual Baseline (Condo)	Each	1	1
Advanced Thermostat - Manual Baseline (SF)	Each	44	44
Advanced Thermostat - Programmable Baseline (Condo)	Each	4	4
Advanced Thermostat - Programmable Baseline (SF)	Each	83	83
Thermostat - Boiler Programmable	Each	11	11
Thermostat - Boiler Reprogram	Each	11	11
Thermostat - Furnace Programmable	Each	126	126
Thermostat - Furnace Reprogram	Each	219*	216

\* Note: Three household accounts performed two furnace reprogramming thermostats. Verified savings were allowed for only one thermostat reprogramming per household as required by the TRM (TRM v6.0).

Source: North Shore Gas tracking data (February 4, 2019) and Navigant team analysis.

## 3. PROGRAM SAVINGS SUMMARY

Table 3-1 summarizes the energy savings the PGL Home Energy Jumpstart program achieved in 2018.

**Table 3-1. 2018 Annual Energy Savings Summary for PGL**

Program	Ex Ante Gross Savings (Therms)*	Verified Gross RR†	Verified Gross Savings (Therms)	NTG‡	Verified Net Savings (Therms)
Total 2018	216,845	106%	230,407	0.97	222,429

\* Franklin Energy reported net savings in the “Therm Savings” field in the final tracking data. Ex Ante Gross Savings were calculated by dividing “Therm Savings” by the adjusted net-to-gross (NTG) value found in Franklin Energy’s MMDB. The adjusted NTG value for PGL was 0.921, which is the product of the program’s realization rate for PGL in PY5, 95 percent, and the NTG for the program, 0.96.

† Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.

‡ Net-to-Gross (NTG) is the ratio of verified net savings to verified gross savings. The program-level NTG was calculated from measure-level deemed NTG values. Source: PGL\_and\_NSQ\_GPY7\_NTG\_Values\_2017-03-01\_Faucet Aerator Correction 2019-03-20.xlsx, which is to be found on the Illinois SAG web site: <http://ilsag.info/net-to-gross-framework.html>. The corrected NTG for aerators is 1.04 and the NTG is 0.96 for all other measures except advanced thermostats. The Illinois TRM version 6.0 algorithm for advanced thermostats calculates net savings – no further NTG adjustment is required.

Source: Peoples Gas tracking data (February 4, 2019) and Navigant team analysis.

Table 3-2 summarizes the energy savings the NSG Home Energy Jumpstart program achieved in 2018.

**Table 3-2. 2018 Annual Energy Savings Summary for NSG**

Program	Ex Ante Gross Savings (Therms)*	Verified Gross RR†	Verified Gross Savings (Therms)	NTG‡	Verified Net Savings (Therms)
Total 2018	48,497	109%	53,289	0.97	51,607

\* Franklin Energy reported net savings in the “Therm Savings” field in the final tracking data. Ex Ante Gross Savings were calculated by dividing the “Therm Savings” field in the final tracking data by the adjusted net-to-gross (NTG) value found in Franklin Energy’s MMDB. The adjusted NTG value 0.921 for NSG was the same value used by PGL.

† Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.

‡ Net-to-Gross (NTG) is the ratio of verified net savings to verified gross savings. The program-level NTG was calculated from measure-level deemed NTG values. Source: PGL\_and\_NSQ\_GPY7\_NTG\_Values\_2017-03-01\_Faucet Aerator Correction 2019-03-20.xlsx, which is to be found on the Illinois SAG web site: <http://ilsag.info/net-to-gross-framework.html>. The corrected NTG for aerators is 1.04 and the NTG is 0.96 for all other measures except advanced thermostats. The Illinois TRM version 6.0 algorithm for advanced thermostats calculates net savings – no further NTG adjustment is required.

Source: North Shore Gas tracking data (February 4, 2019) and Navigant team analysis.

## 4. PROGRAM SAVINGS BY MEASURE

The PGL program includes 11 measures as shown in the following table. The programmable and re-programming thermostats, and showerheads contributed the most of overall net savings.

**Table 4-1. 2018 Annual Energy Savings by Measure for PGL**

Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR†	Verified Gross Savings (Therms)	NTG‡	Verified Net Savings (Therms)
Boiler Pipe Insulation	84	100%	84	0.96	81
Faucet Aerator - Bathroom	1,507	100%	1,507	1.04	1,568
Faucet Aerator - Kitchen	3,759	100%	3,759	1.04	3,909
Pipe Insulation - DHW Outlet	4,562	100%	4,562	0.96	4,380
Showerhead	36,692	138%	50,530	0.96	48,509
Advanced Thermostat - Manual Baseline (Condo)	862	100%	862	NA§	862
Advanced Thermostat - Manual Baseline (SF)	11,320	99%	11,231	NA§	11,231
Advanced Thermostat - Programmable Baseline (Condo)	1,244	100%	1,244	NA§	1,244
Advanced Thermostat - Programmable Baseline (SF)	7,092	100%	7,092	NA§	7,092
Thermostat - Boiler Programmable/Reprogram	25,725	100%	25,725	0.96	24,696
Thermostat - Furnace Programmable/Reprogram	123,998	100%	123,811	0.96	118,858
<b>Total 2018*</b>	<b>216,845</b>	<b>106%</b>	<b>230,407</b>		<b>222,429</b>

\*Sum of savings may not equal the total due to rounding.

† Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.

‡ Net-to-Gross (NTG) is the ratio of verified net savings to verified gross savings. The NTG is a deemed value. Source: PGL\_and\_NSQ\_GPY7\_NTG\_Values\_2017-03-01\_Faucet Aerator Correction 2019-03-20.xlsx, which is to be found on the Illinois SAG web site: <http://ilsag.info/net-to-gross-framework.html>. The corrected NTG for aerators is 1.04 and the NTG is 0.96 for all other measures except advanced thermostats.

§ The Illinois TRM version 6.0 algorithm for advanced thermostats calculates net savings – no further NTG adjustment is required.

Source: Peoples Gas tracking data (February 4, 2019) and Navigant team analysis.

The NSG program includes 11 measures as shown in the following table. The programmable and re-programming thermostats, and showerheads contributed the most of overall net savings.

**Table 4-2. 2018 Annual Energy Savings by Measure for NSG**

Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR†	Verified Gross Savings (Therms)	NTG‡	Verified Net Savings (Therms)
Boiler Pipe Insulation	61	100%	61	0.96	59
Faucet Aerator – Bathroom	873	100%	873	1.04	908
Faucet Aerator – Kitchen	371	100%	371	1.04	386
Pipe Insulation - DHW Outlet	1,697	100%	1,697	0.96	1,629
Showerhead	13,203	138%	18,182	0.96	17,455
Advanced Thermostat - Manual Baseline (Condo)	57	100%	57	NA§	57
Advanced Thermostat - Manual Baseline (SF)	3,891	100%	3,891	NA§	3,891
Advanced Thermostat - Programmable Baseline (Condo)	146	100%	146	NA§	146
Advanced Thermostat - Programmable Baseline (SF)	4,671	100%	4,671	NA§	4,671
Thermostat - Boiler Programmable/Reprogram	2,028	100%	2,028	0.96	1,947
Thermostat - Furnace Programmable/Reprogram	21,497	99%	21,310	0.96	20,458
<b>Total 2018*</b>	<b>48,497</b>	<b>109%</b>	<b>53,289</b>		<b>51,607</b>

\*Sum of savings may not equal the total due to rounding.



† Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.

‡ Net-to-Gross (NTG) is the ratio of verified net savings to verified gross savings. The NTG is a deemed value. Source:

PGL\_and\_NSQ\_GPY7\_NTG\_Values\_2017-03-01\_Faucet Aerator Correction 2019-03-20.xlsx, which is to be found on the Illinois SAG web site: <http://ilsag.info/net-to-gross-framework.html>. The corrected NTG for aerators is 1.04 and the NTG is 0.96 for all other measures except advanced thermostats.

§ The Illinois TRM version 6.0 algorithm for advanced thermostats calculates net savings – no further NTG adjustment is required.

Source: *North Shore Gas tracking data (February 4, 2019) and Navigant 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 percent. Data sources for verification of measure savings in the 2018 HEJ Program are defined in the Illinois Statewide Technical Reference Manual for Energy Efficiency Version 6.0 (IL TRM). Appendix 1 provides a description of the impact analysis methodology.

**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 Pipe Insulation	Linear Feet	0.41	0.41	100%	IL TRM v6.0 - Section 5.3.2
Faucet Aerator - Bathroom	Each	0.87	0.87	100%	IL TRM v6.0 - Section 5.4.4
Faucet Aerator - Kitchen	Each	2.85	2.85	100%	IL TRM v6.0 - Section 5.4.4
Pipe Insulation - DHW Outlet	Linear Feet	0.99	0.99	100%	IL TRM v6.0 - Section 5.4.1
Showerhead	Each	10.20	14.04	138%	IL TRM v6.0 - Section 5.4.5
Smart Thermostat - Manual Baseline (Condo)	Each	57.48	57.49	100%	IL TRM v6.0 - Section 5.3.16
Smart Thermostat - Manual Baseline (SF)	Each	88.44	88.44	100%	IL TRM v6.0 - Section 5.3.16
Smart Thermostat - Programmable Baseline (Condo)	Each	36.58	36.58	100%	IL TRM v6.0 - Section 5.3.16
Smart Thermostat - Programmable Baseline (SF)	Each	56.28	56.28	100%	IL TRM v6.0 - Section 5.3.16
Thermostat - Boiler Programmable/Reprogram	Each	92.20	92.20	100%	IL TRM v6.0 - Section 5.3.11
Thermostat - Furnace Programmable/Reprogram	Each	62.31	62.31	100%	IL TRM v6.0 - Section 5.3.11

\* Illinois Statewide Technical Reference Manual for Energy Efficiency Version 6.0 from <http://www.ilsag.info/technical-reference-manual.html>.

The following summarizes Navigant’s findings and recommendation for the Home Energy Jumpstart program.

### 5.2 Other Findings and Recommendations

#### Showerheads

The showerhead had a realization rate of 138 percent. The TRM (v6.0) deemed value for the flow rate (gallons per minute, gpm) of a baseline showerhead is 2.67 gpm for Single Family Direct Install program scenarios. Franklin Energy uses 2.35 gpm in their ex ante savings calculation. The TRM v6.0 does not allow for custom baseline flow rate values, therefore, Navigant calculated verified gross savings using the TRM v6.0 deemed value of 2.67 gpm. The direct install showerhead baseline flow rate changes to 2.24 gpm in TRM (v7.0), effective for 2019.

**Recommendation 1.** Navigant recognizes that Franklin Energy has updated the GPM\_base to TRM (v7.0) value of 2.24 in the 2019 MMDB. No further recommendation is provided.

### Thermostats

Navigant found seven projects or household accounts (defined as possessing a unique telephone number and address) where the ex ante claimed savings for two thermostats. Per IL TRM v6.0, savings for only one thermostat can be claimed per household. Navigant adjusted the savings for one PGL advanced thermostat, and three each of furnace reprogramming thermostats for PGL and NSG.

**Recommendation 2.** Navigant recommends Franklin claim savings for only one programmable or one advanced thermostat per household.

### Historical Results

Table 5-2 below shows the historical gross realization rates and NTG values for the Home Energy Jumpstart Program.

**Table 5-2. Historical Realization Rates and NTG Values**

Program Year	PGL Verified Gross RR	NSG Verified Gross RR	PGL NTG	NSG NTG
GPY1	100%	NA	0.86	NA
GPY2	93%	89%	0.96	0.96
GPY3	99%	98%	0.96	0.96
GPY4	100%	100%	0.96	0.96
GPY5	95%	99%	0.96	0.96
GPY6	107%	110%	0.96	0.96
2018	106%	109%	0.97	0.97

Source: Navigant evaluation research.

## 6. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

Navigant compared the savings calculation method in the 2018 tracking data to Franklin Energy's "Master Measure Database" file (MMDB)<sup>1</sup>, which feeds into calculating the tracking data savings, and to IL TRM-based savings values. Navigant verified that the IL TRM algorithms were correctly applied in the MMDB. Navigant checked that measure inputs matched deemed IL TRM inputs and validated custom inputs. To be eligible, an IL TRM measure must meet the physical, operational, and baseline characteristics as defined in the applicable version of the IL TRM.<sup>2</sup>

Navigant reviewed the program tracking data drawn from a February 4, 2019 extract 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.

Navigant calculated verified net energy savings by multiplying the verified gross savings estimates by a net-to-gross ratio (NTG). In 2018, the NTG estimates used to calculate the net verified savings were based on past evaluation research and defined by a consensus process through SAG, as documented in a spreadsheet.<sup>3</sup>

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<sup>1</sup> File name: RESIDENTIAL PG NSG MMDB PY7 2018-08-09, produced by Franklin Energy.

<sup>2</sup> Illinois Statewide Technical Reference Manual for Energy Efficiency Version 6.0 from <http://www.ilsag.info/technical-reference-manual.html>

<sup>3</sup> Source: PGL\_and\_NSQ\_GPY7\_NTG\_Values\_2017-03-01\_Faucet Aerator Correction 2019-03-20.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>. The corrected NTG for aerators is 1.04 (based on zero free ridership and 4 percent spillover) and the NTG is 0.96 for all other measures except advanced thermostats. The Illinois TRM version 6.0 algorithm for advanced thermostats calculates net savings – no further NTG adjustment is required.

## 7. APPENDIX 2. PROGRAM-SPECIFIC INPUTS FOR THE ILLINOIS TRC

Table 7-1 and Table 7-2, the Total Resource Cost (TRC) variable tables for PGL and NSG, respectively, only include cost-effectiveness analysis inputs available at the time of finalizing the 2018 HEJ impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in these tables and will be provided to evaluation later. Details in these tables (e.g., EULs), other than final 2018 savings and program data, are subject to change and are not final.

**Table 7-1. Total Resource Cost Savings Summary for PGL**

Measure	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Boiler Pipe Insulation	Linear Feet	205	15.0	84	84	81
Faucet Aerator - Bathroom	Each	1727	9.0	1,507	1,507	1,568
Faucet Aerator - Kitchen	Each	1318	9.0	3,759	3,759	3,909
Pipe Insulation - DHW Outlet	Linear Feet	4613	15.0	4,562	4,562	4,380
Showerhead	Each	3599	10.0	36,692	50,530	48,509
Smart Thermostat - Manual Baseline (Condo)	Each	15	10.0	862	862	862
Smart Thermostat - Manual Baseline (SF)	Each	127	10.0	11,320	11,231	11,231
Smart Thermostat - Programmable Baseline (Condo)	Each	34	10.0	1,244	1,244	1,244
Smart Thermostat - Programmable Baseline (SF)	Each	126	10.0	7,092	7,092	7,092
Thermostat - Boiler Programmable	Each	145	5.0	13,369	13,369	12,835
Thermostat - Boiler Reprogram	Each	134	2.0	12,355	12,355	11,861
Thermostat - Furnace Programmable	Each	815	5.0	50,783	50,783	48,752
Thermostat - Furnace Reprogram	Each	1172	2.0	73,215	73,028	70,107
<b>Total/Weighted Average</b>		<b>14,030</b>	<b>5.7</b>	<b>216,845</b>	<b>230,407</b>	<b>222,429</b>

Source: Peoples Gas tracking data (February 4, 2019) and Navigant team analysis.

**Table 7-2. Total Resource Cost Savings Summary for NSG**

Measure	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Boiler Pipe Insulation	Linear Feet	149	15.0	61	61	59
Faucet Aerator - Bathroom	Each	1000	9.0	873	873	908
Faucet Aerator - Kitchen	Each	130	9.0	371	371	386
Pipe Insulation - DHW Outlet	Linear Feet	1716	15.0	1,697	1,697	1,629
Showerhead	Each	1295	10.0	13,203	18,182	17,455
Smart Thermostat - Manual Baseline (Condo)	Each	1	10.0	57	57	57
Smart Thermostat - Manual Baseline (SF)	Each	44	10.0	3,891	3,891	3,891
Smart Thermostat - Programmable Baseline (Condo)	Each	4	10.0	146	146	146
Smart Thermostat - Programmable Baseline (SF)	Each	83	10.0	4,671	4,671	4,671
Thermostat - Boiler Programmable	Each	11	5.0	1,014	1,014	974
Thermostat - Boiler Reprogram	Each	11	2.0	1,014	1,014	974
Thermostat - Furnace Programmable	Each	126	5.0	7,851	7,851	7,537
Thermostat - Furnace Reprogram	Each	216	2.0	13,646	13,459	12,921
<b>Total/Weighted Average</b>		<b>4,786</b>	<b>7.1</b>	<b>48,497</b>	<b>53,289</b>	<b>51,607</b>

Source: North Shore Gas tracking data (February 4, 2019) and Navigant team analysis.