



PEOPLES GAS
NATURAL GAS DELIVERY

NORTH SHORE GAS®
NATURAL GAS DELIVERY

Presentation to the Stakeholder Advisory Group

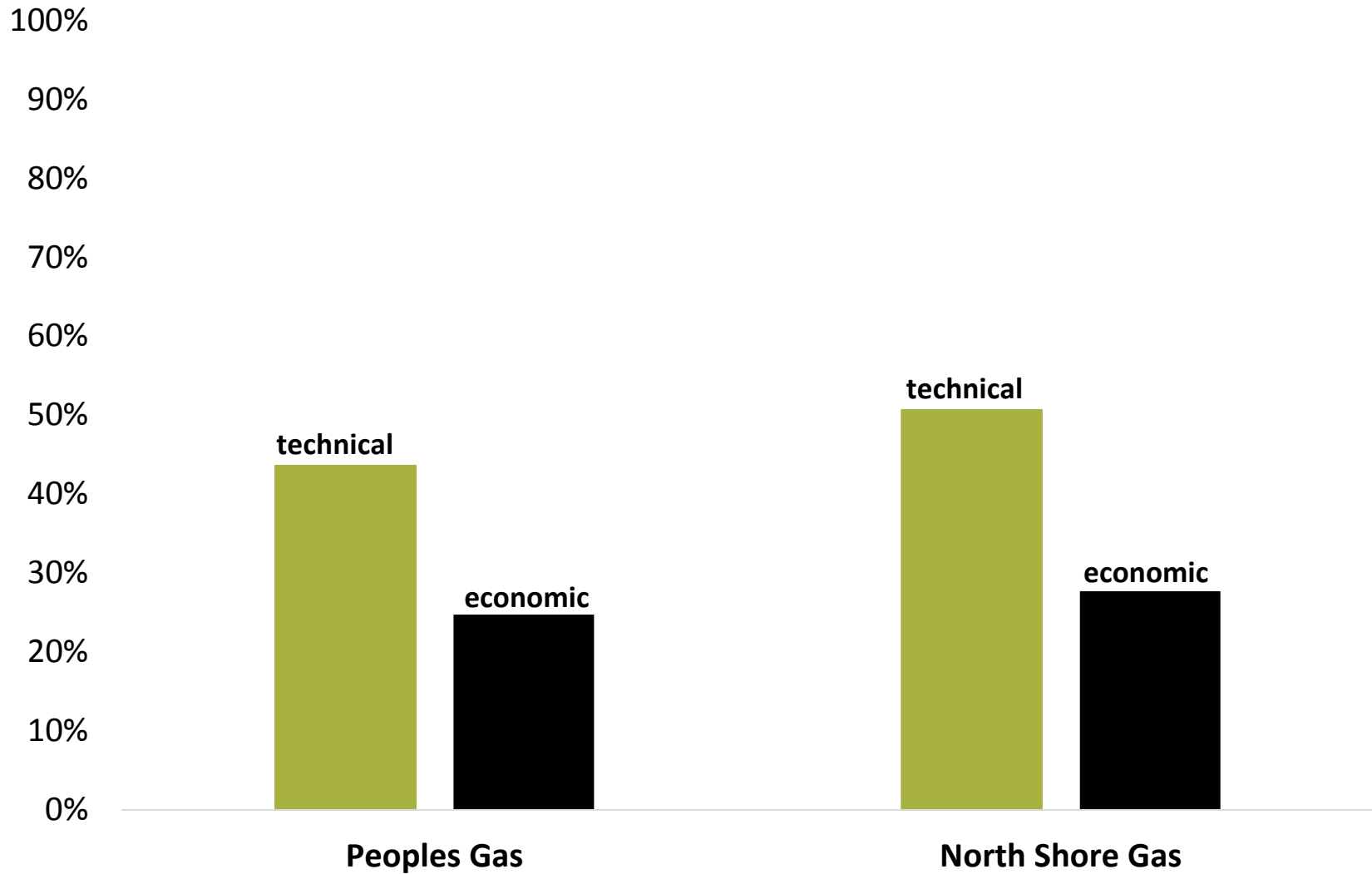
ENERGY EFFICIENCY POTENTIAL

PY7 - PY9

FEBRUARY 22, 2016

STUDY FINDINGS

Estimates of Instantaneous Energy Efficiency Potential



PEOPLES GAS						
Program Year	Time Period	Relevant Sales (therms)	Statutory Goal (% of sales)	Statutory Goal (therms)	Achievable Potential (% of sales)	Achievable Potential (therms)
7	6/2017 - 5/2018	1,354,563,430	1.40%	18,963,888	0.57%	7,733,392
8	6/2018 - 5/2019	1,354,563,430	1.50%	20,318,451	0.49%	6,673,654
9	5/2019 - 6/2020	1,354,563,430	1.50%	20,318,451	0.49%	6,673,654

NORTH SHORE GAS						
Program Year	Time Period	Relevant Sales (therms)	Statutory Goal (% of sales)	Statutory Goal (therms)	Achievable Potential (% of sales)	Achievable Potential (therms)
7	6/2017 - 5/2018	296,259,200	1.40%	4,147,629	0.60%	1,769,005
8	6/2018 - 5/2019	296,259,200	1.50%	4,443,888	0.51%	1,504,997
9	6/2019 - 5/2020	296,259,200	1.50%	4,443,888	0.51%	1,504,997

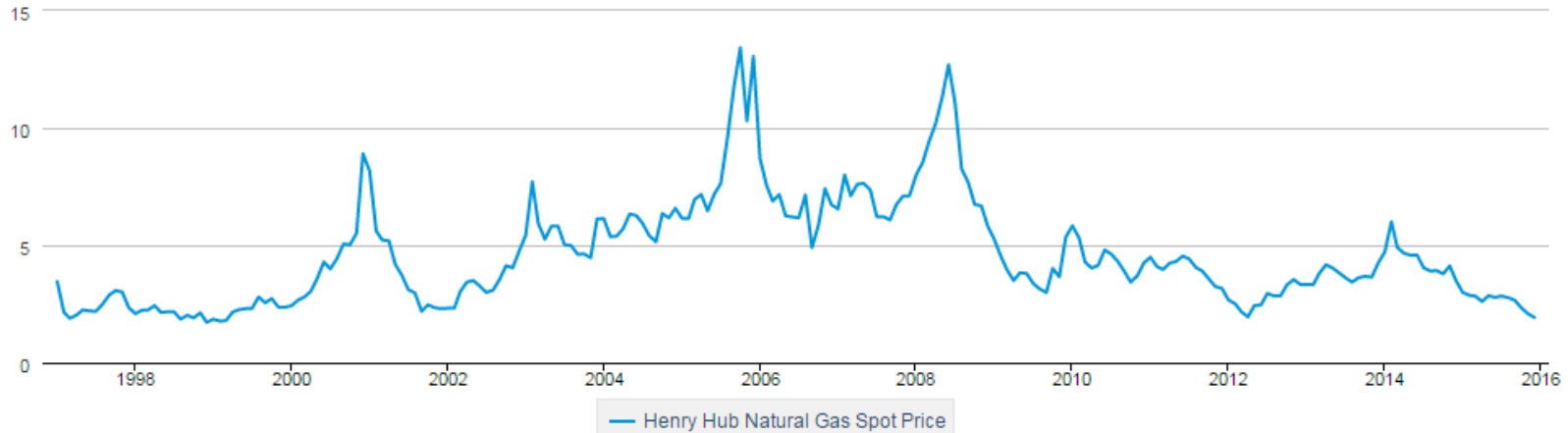
NORTH SHORE GAS (no budget cap)						
Program Year	Time Period	Relevant Sales (therms)	Statutory Goal (% of sales)	Statutory Goal (therms)	Achievable Potential (% of sales)	Achievable Potential (therms)
7	6/2017 - 5/2018	296,259,200	1.40%	4,147,629	0.60%	1,769,005
8	6/2018 - 5/2019	296,259,200	1.50%	4,443,888	0.51%	1,504,997
9	6/2019 - 5/2020	296,259,200	1.50%	4,443,888	0.51%	1,504,997

NORTH SHORE GAS (with budget cap)						
Program Year	Time Period	Relevant Sales (therms)	Statutory Target (% of sales)	Statutory Target (therms)	Achievable Potential (% of sales)	Achievable Potential (therms)
7	6/2017 - 5/2018	296,259,200	1.40%	4,147,629	0.51%	1,596,113
8	6/2018 - 5/2019	296,259,200	1.50%	4,443,888	0.38%	1,332,105
9	6/2019 - 5/2020	296,259,200	1.50%	4,443,888	0.38%	1,332,105

Henry Hub Natural Gas Spot Price

[↓ DOWNLOAD](#)

Dollars per Million Btu



With gas prices relatively low,
neither utility can reach the
statutory savings target

North Shore reaches the budget cap before it reaches achievable potential.



Peoples Gas does not.

STUDY APPROACH

PEOPLES GAS
NATURAL GAS DELIVERY

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Diverse backgrounds drive study



ANDREA CHERNEY
behavioral analysis



JEANNETTE LEZAKS
project manager
model development



MELANIE LORD
survey design
secondary research



SCOTT PIGG
engineering analysis
billing analysis



STEVE KIHM
achievability analysis



CHERIE WILLIAMS
graphic design



DAN CAUTLEY
engineering analysis



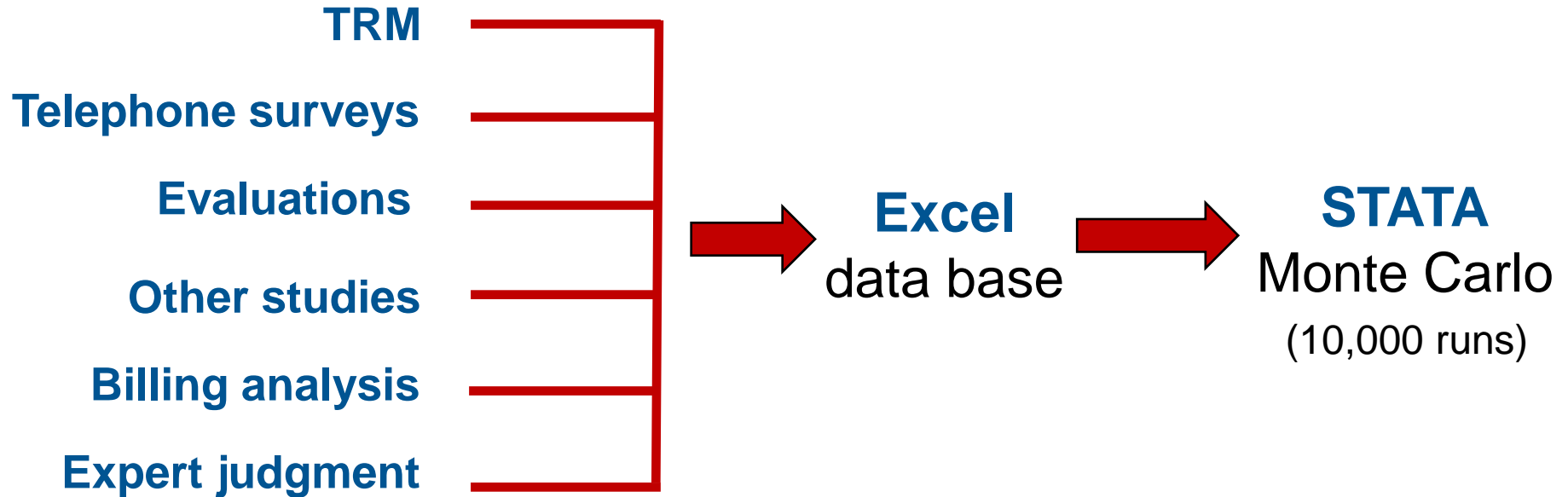
SCOTT SCHUETTER
engineering analysis



JOE KRAMER
surveys



DOUG AHL
technical assistance



ASSEMBLING THE DATA

PEOPLES GAS
NATURAL GAS DELIVERY

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		TELEPHONE SURVEY
RESIDENTIAL	Peoples Gas	705
	North Shore Gas	262
COMMERCIAL and INDUSTRIAL	Peoples Gas	374
	North Shore Gas	385
GOVERNMENT	Peoples Gas	83
	North Shore Gas	78

housing characteristics

dwelling type
age of residence

appliance characteristics

space heating source
water heating source

respondent characteristics

size of household
person's age

behavioral characteristics

furnace maintenance
thermostat setback

building characteristics

area (sq. ft.)
age

organization characteristics

primary activity
expansion plans



gas usage

space/water heating
manufacturing processes

energy management

recent energy audits
knowledge of utility programs

Peoples Gas

- Residential accounts
 - **107,800**
- Business accounts
 - **51,300**
- Total accounts
 - **159,100**

North Shore Gas

- Residential accounts
 - **148,900**
- Business accounts
 - **12,400**
- Total accounts
 - **161,300**

Cracking the TEAPOT: Technical, Economic, and Achievable Energy Efficiency Potential Studies

Max Neubauer
August 2014
Report U1407

ACEEE

Potential for Natural Gas Fuel Efficiency Savings in Vermont Final Report

February 10, 2015

Prepared for



by



FINAL REPORT

THE CADMUS GROUP, INC.

Assessment of Energy and Capacity Savings Potential in Iowa

February 28, 2012

The cover features a collage of images including wind turbines, solar panels, water droplets, and natural landscapes, arranged in a diagonal pattern.

ENERGY CENTER OF WISCONSIN

PREPARED BY
Energy Center of Wisconsin

Peoples Gas Light and Coke Company
Wasted Energy Study

November 2014

The cover includes the Energy Center of Wisconsin logo and a red and black horizontal bar.

NREL/TP-462-4860 • UC Category: 233 • DE92016409

Market Penetration of New Energy Technologies

Daniel J. Packey

The cover features a large circular graphic and the NREL logo at the bottom.

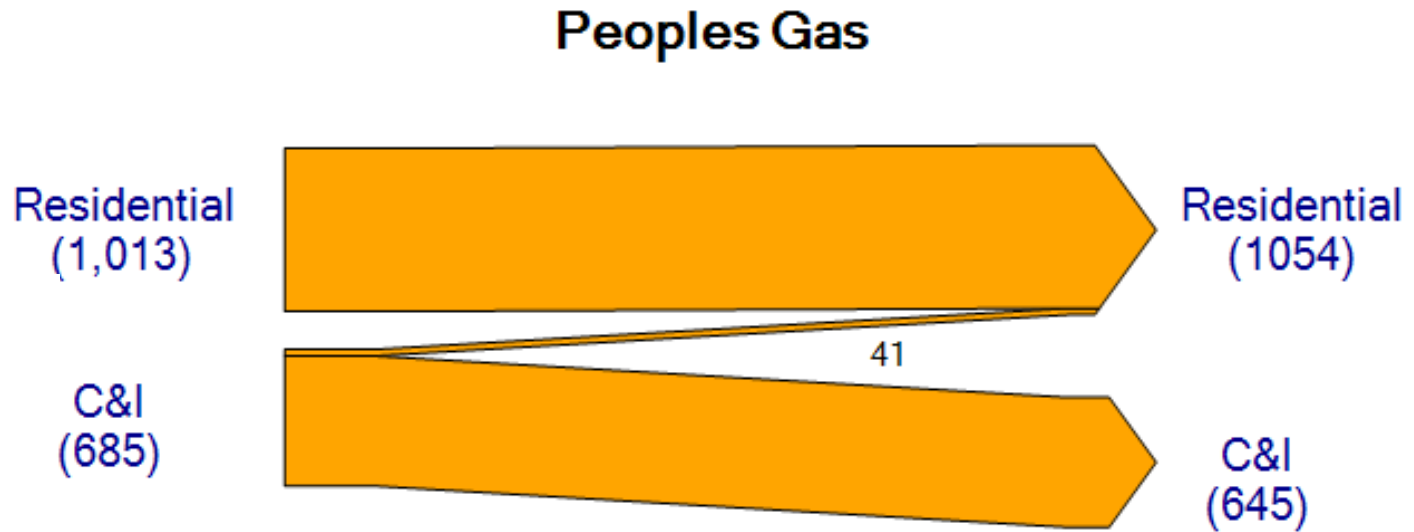
UTILITY CHARACTERISTICS

PEOPLES GAS
NATURAL GAS DELIVERY

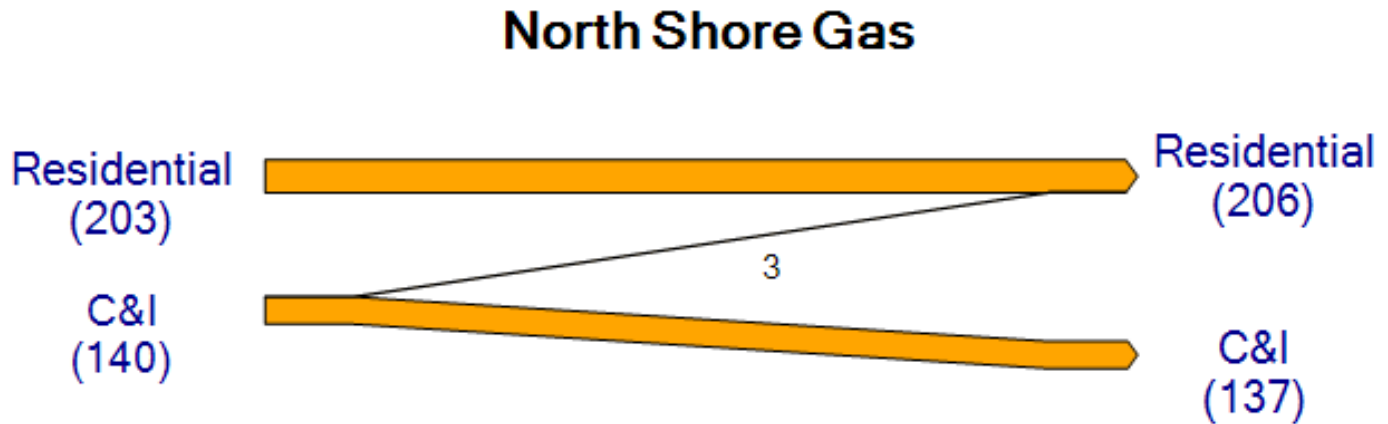
NORTH SHORE GAS®
NATURAL GAS DELIVERY



therm flows (millions)

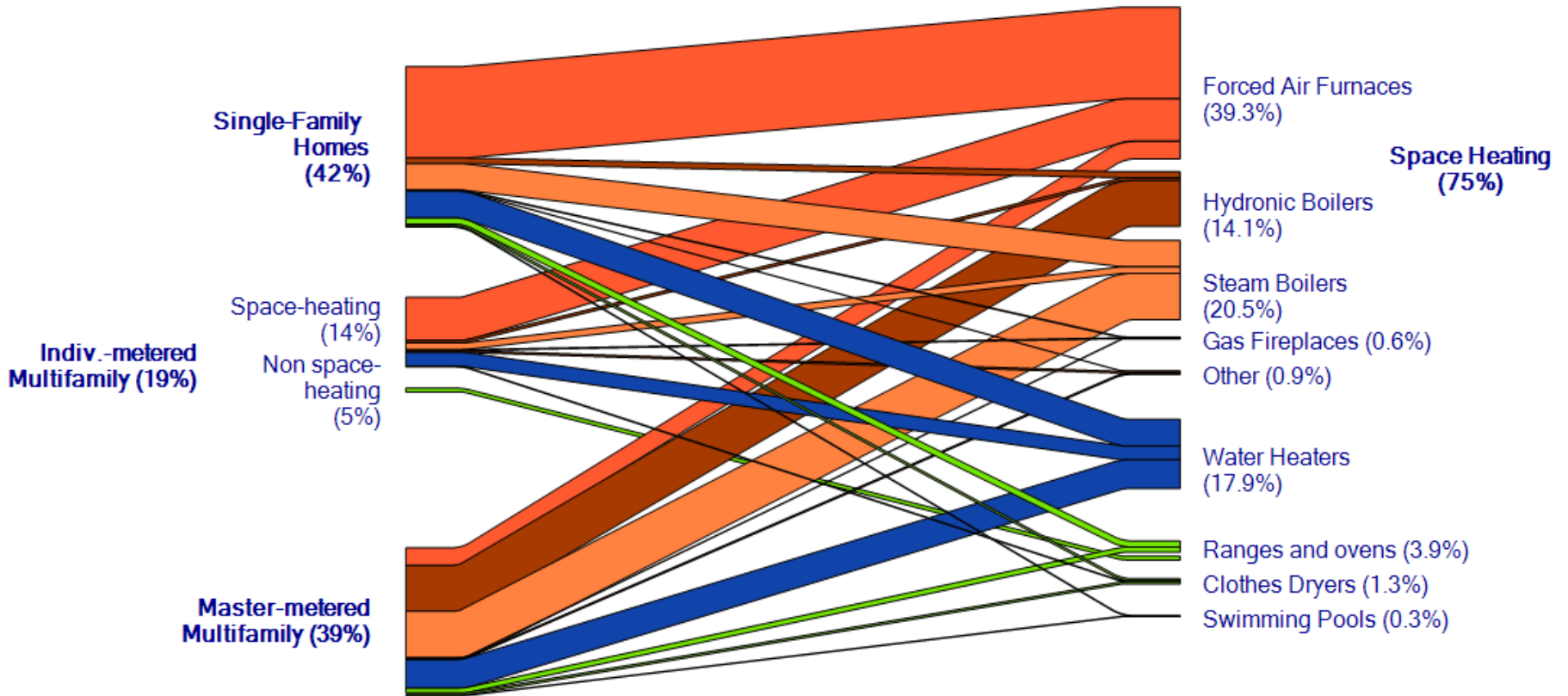


therm flows (millions)



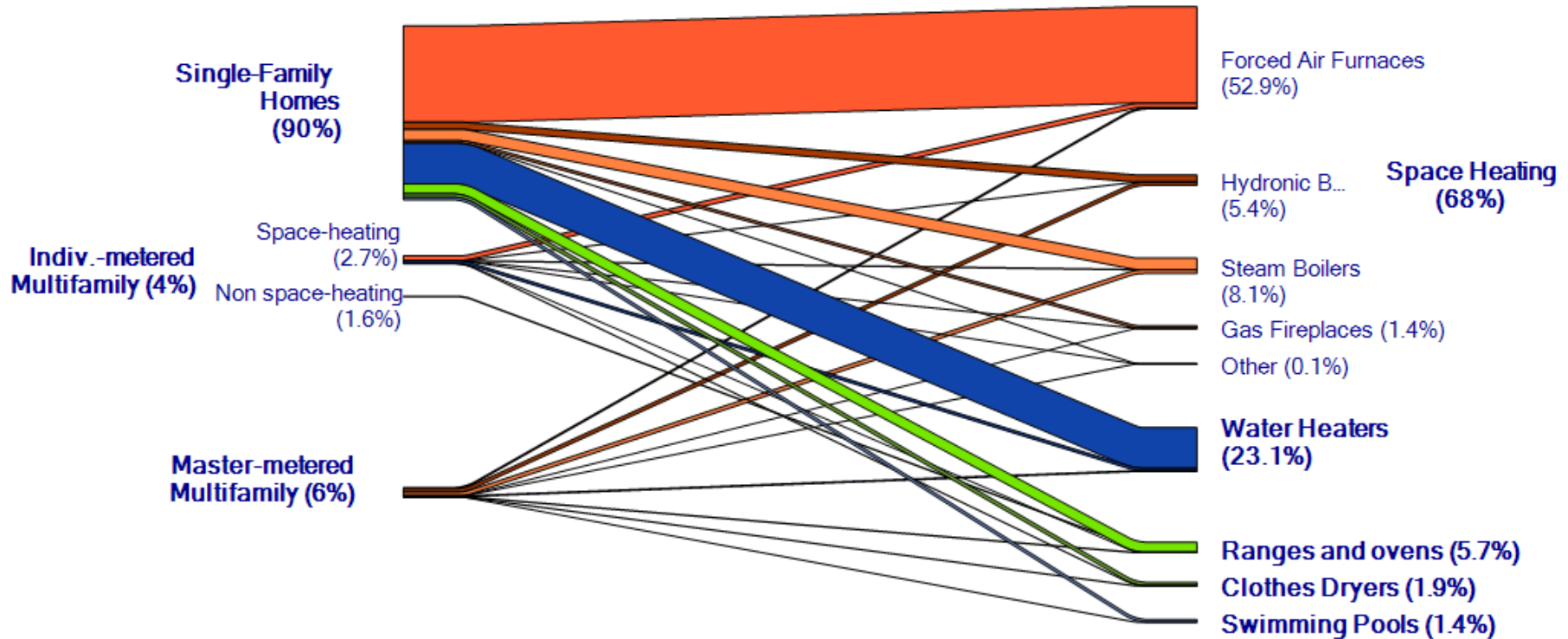
gas flow by segment and end-use

Peoples Gas Residential Therms



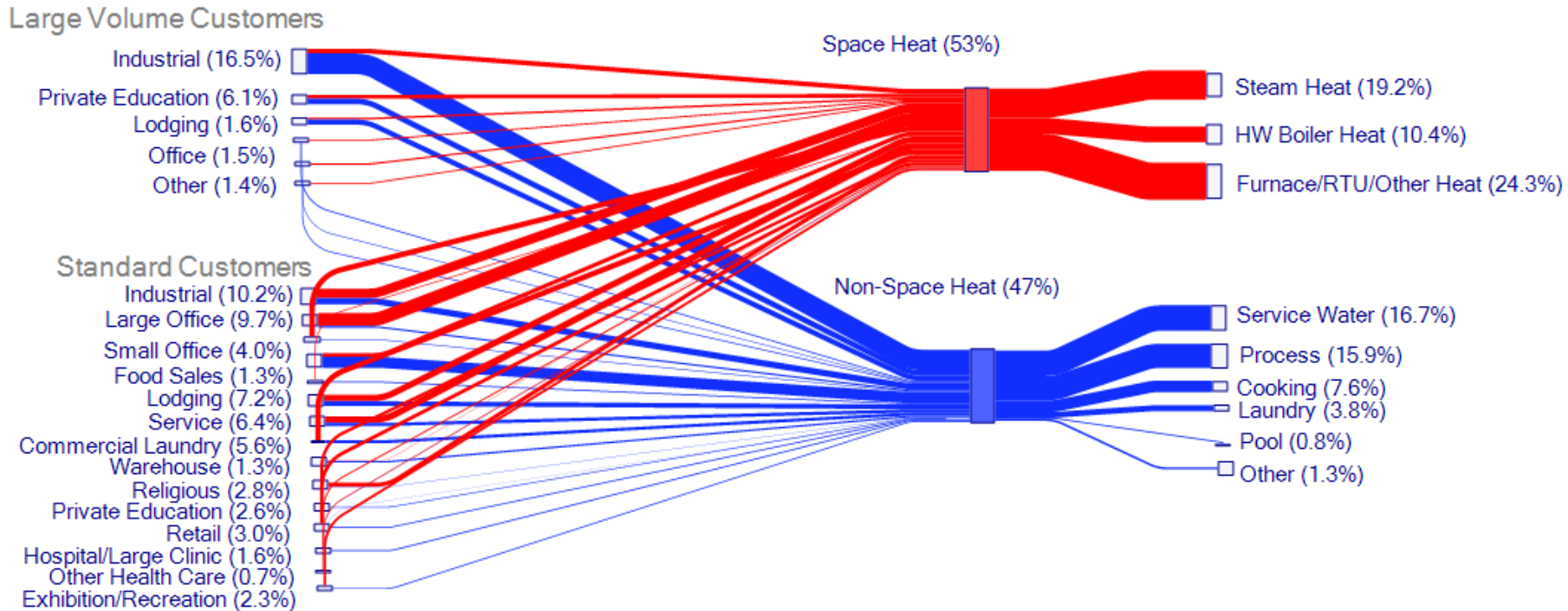
gas flow by segment and end-use

North Shore Gas Residential Therms



gas flow by segment and end-use

Peoples Gas Commercial/Industrial Therms



gas flow by segment and end-use

North Shore Gas Commercial/Industrial Therms

Large Volume Customers

- Industrial (16.8%)
- Hospital (12.2%)
- Office (0.5%)

Space Heat (53%)

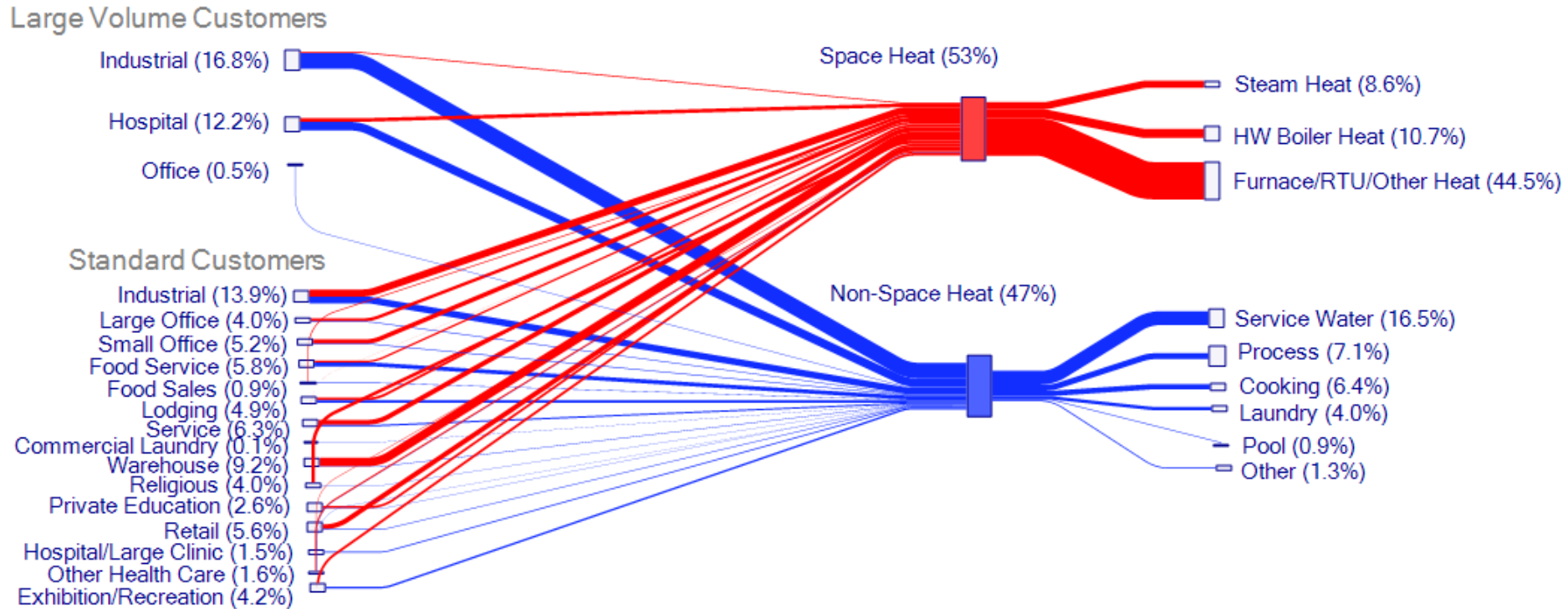
- Steam Heat (8.6%)
- HW Boiler Heat (10.7%)
- Furnace/RTU/Other Heat (44.5%)

Standard Customers

- Industrial (13.9%)
- Large Office (4.0%)
- Small Office (5.2%)
- Food Service (5.8%)
- Food Sales (0.9%)
- Lodging (4.9%)
- Service (6.3%)
- Commercial Laundry (0.1%)
- Warehouse (9.2%)
- Religious (4.0%)
- Private Education (2.6%)
- Retail (5.6%)
- Hospital/Large Clinic (1.5%)
- Other Health Care (1.6%)
- Exhibition/Recreation (4.2%)

Non-Space Heat (47%)

- Service Water (16.5%)
- Process (7.1%)
- Cooking (6.4%)
- Laundry (4.0%)
- Pool (0.9%)
- Other (1.3%)



COST OF ENERGY SAVED

PEOPLES GAS
NATURAL GAS DELIVERY

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\$0.44 per
therm

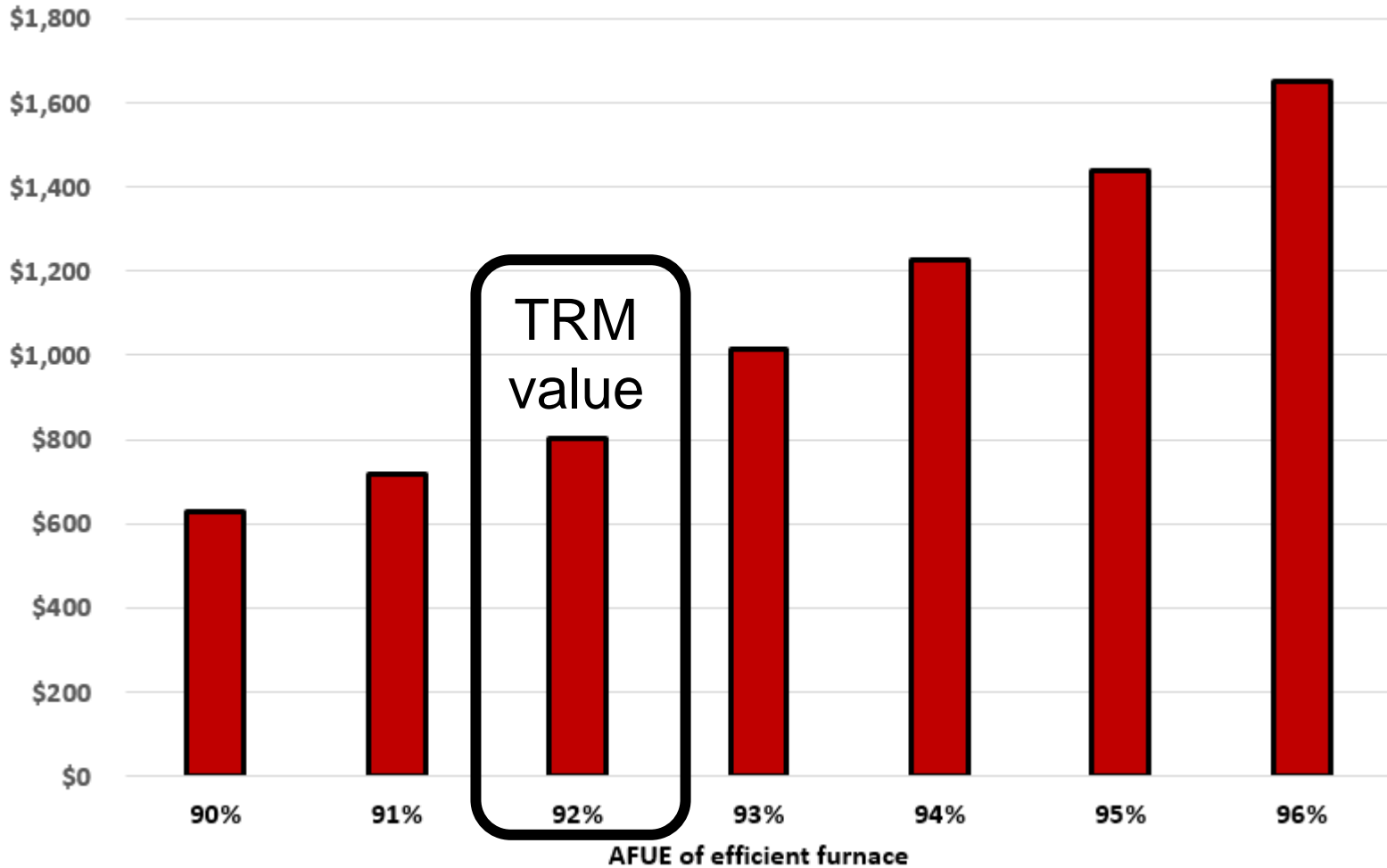
cost of incremental
gas supply

?

cost of energy
efficiency measure
per therm saved

High efficiency furnace cost

Incremental Cost of Higher Efficiency Furnaces
Relative to Standard Efficiency (80% AFUE)



\$800
incremental cost

20 year
estimated life

\$62 per year
annual cost

130 therms
annual savings

\$62 / 130 therms

\$0.48 per therm

\$800
incremental cost

130 therms
annual savings

20 year
estimated life

1,672 effective
total therms

\$800 / 1,672 therms

\$0.48 per therm

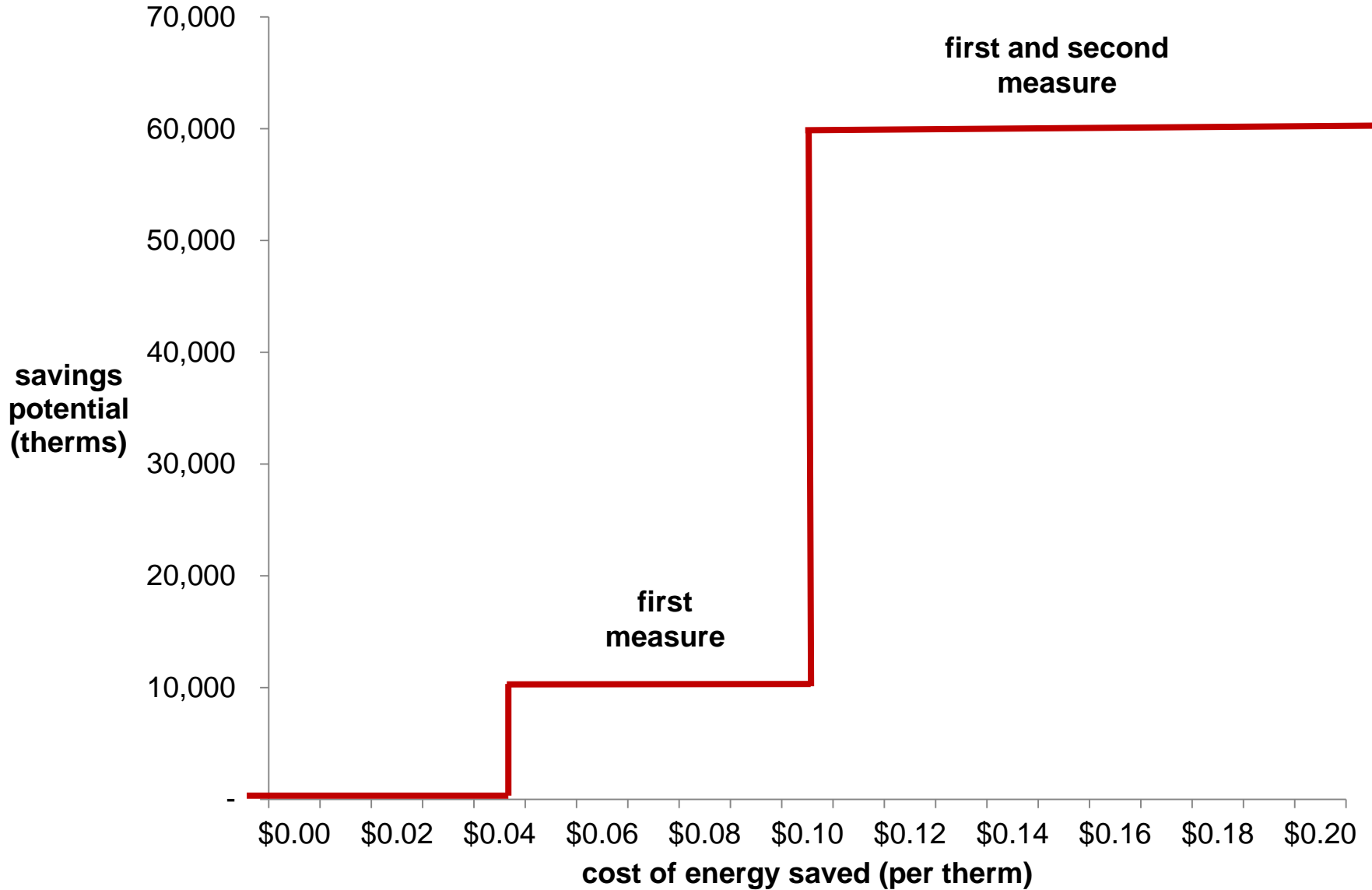
If high-efficiency furnaces were cost-effective:

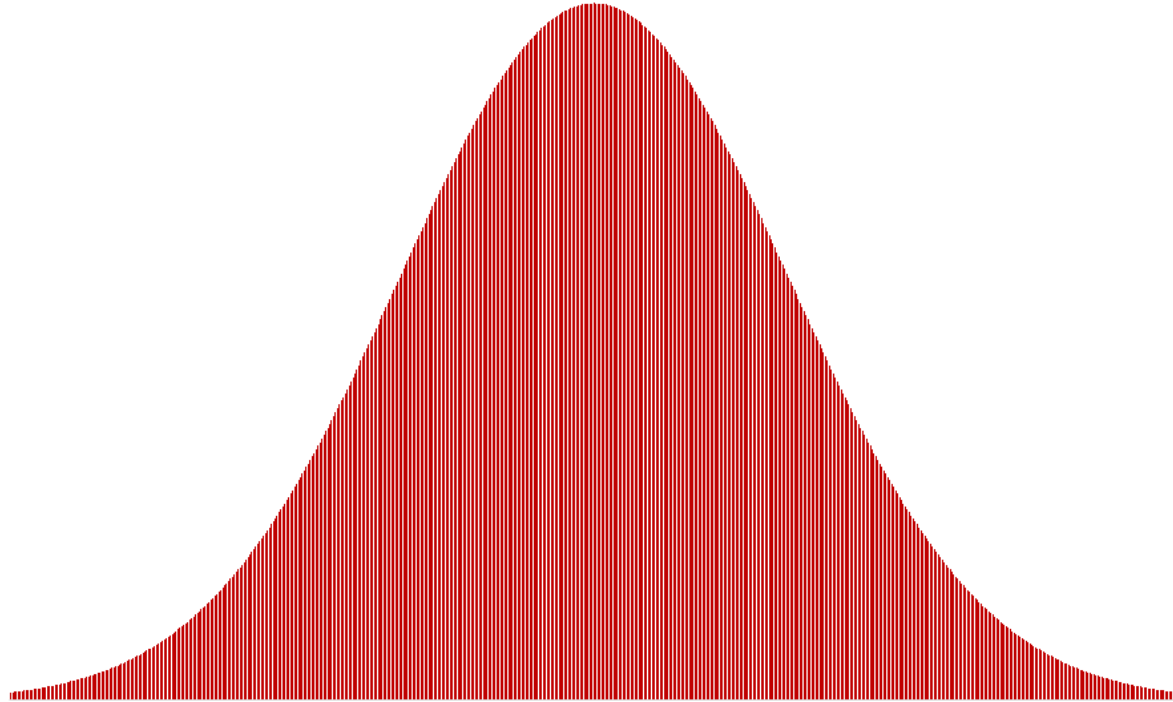
Peoples Gas: add 257,000 therms of annual savings

North Shore Gas: add 86,000 therms of annual savings

Peoples Gas achievable potential **0.57%**  **0.59%**

North Shore Gas achievable potential **0.60%**  **0.63%**





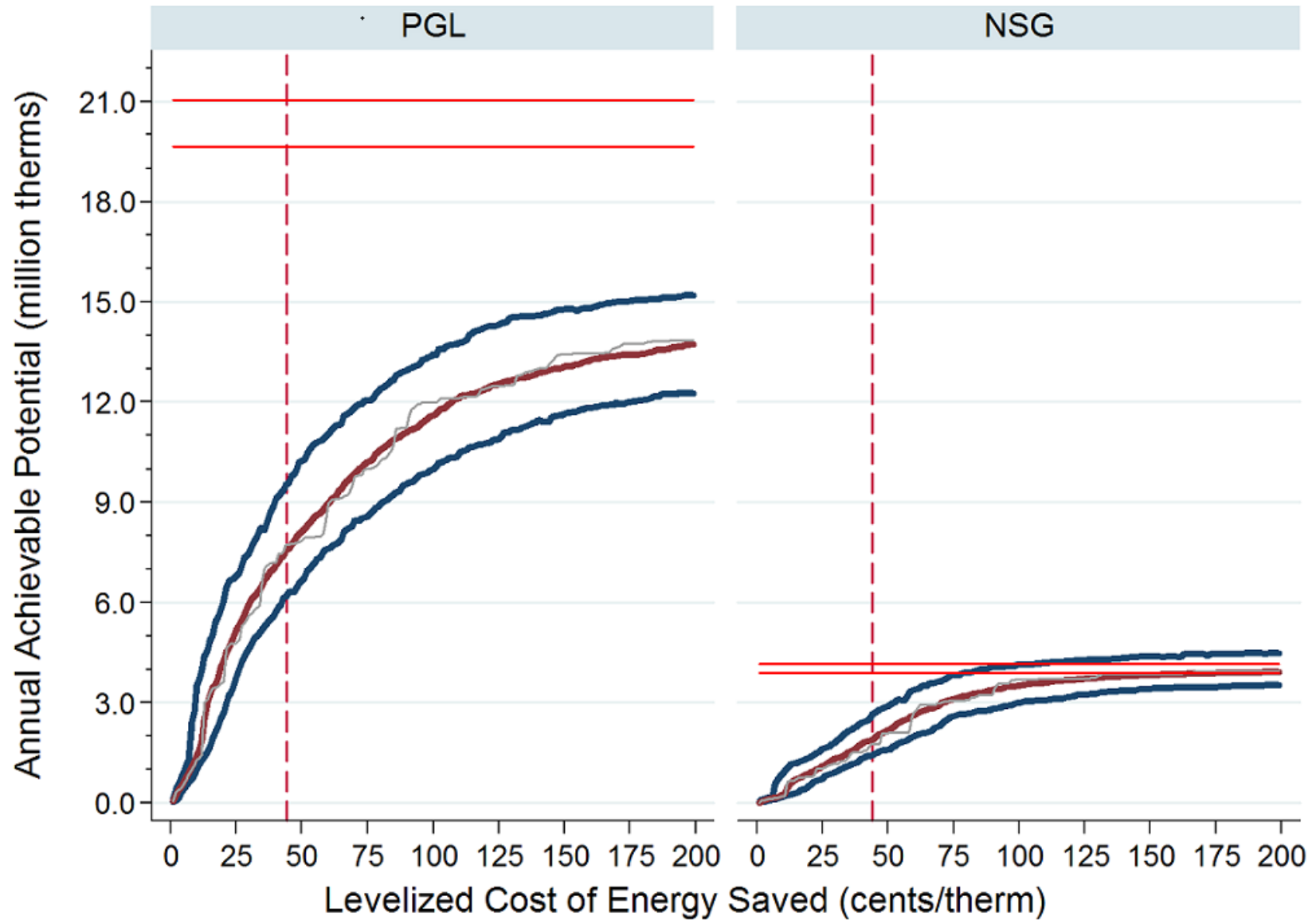
*measure
savings*

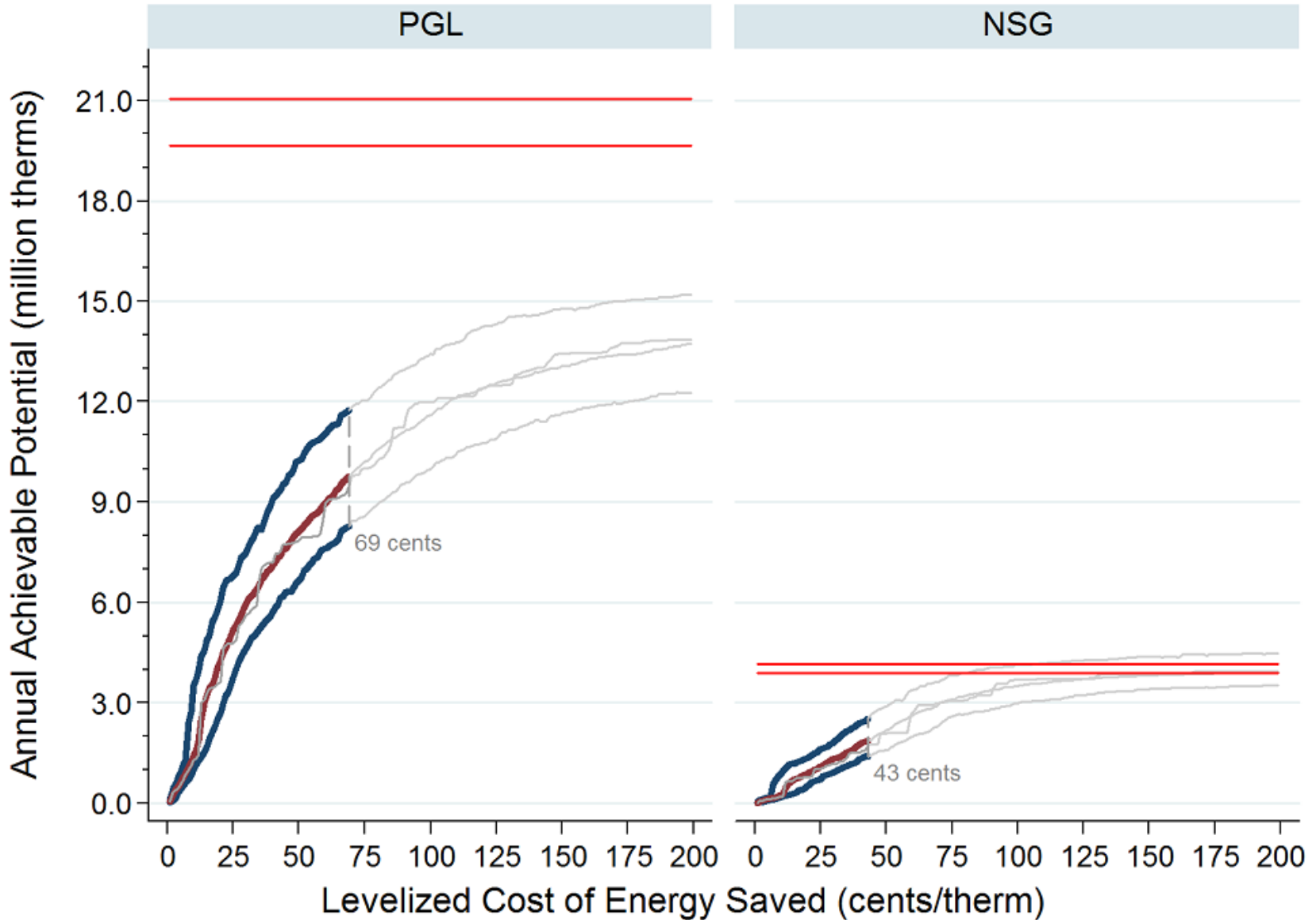
*measure
cost*

*achievability
factor*

*net-to-gross
ratio*

MODEL RESULTS





Peoples Gas top residential measures

Description of Measure	therms savings	% of total	cumulative % of total	cost of energy saved
Home energy reports - decile 1	1,510,500	32%	32%	\$ 0.13
Home energy reports - decile 2	954,004	21%	53%	\$ 0.21
Air sealing	283,587	6%	59%	\$ 0.35
Smart thermostat - ROB contractor install	249,846	5%	64%	\$ 0.41
Home energy reports - decile 3	242,511	5%	70%	\$ 0.27
Steam system pipe insulation	202,386	4%	74%	\$ 0.07
Home energy reports - decile 4	187,967	4%	78%	\$ 0.35
Clothes Washer Recycling	173,832	4%	82%	\$ 0.20
Programmable thermostat	138,417	3%	85%	\$ 0.22
Condensing Storage water heater	105,271	2%	87%	\$ 0.24
Gas boiler upgrade - 95%	89,796	2%	89%	\$ 0.30
Multifamily Direct Install	74,221	2%	91%	\$ 0.35
Low flow showerhead, direct install	69,230	1%	92%	\$ 0.11
Low flow showerhead, self-installed	67,295	1%	94%	\$ 0.17
Gas boiler upgrade - 90%	55,879	1%	95%	\$ 0.32

Description of Measure	therms savings	% of total	cumulative % of total	cost of energy saved
Home energy reports - decile 1	407,229	38%	38%	\$ 0.12
Home energy reports - decile 2	206,743	19%	57%	\$ 0.23
Air sealing	125,331	12%	68%	\$ 0.35
Smart thermostat - ROB contractor install	106,520	10%	78%	\$ 0.43
Home energy reports - decile 3	50,531	5%	83%	\$ 0.32
Home energy reports - decile 4	38,656	4%	86%	\$ 0.41
Programmable thermostat	37,567	3%	90%	\$ 0.16
Low flow showerhead, direct install	18,754	2%	91%	\$ 0.12
Low flow showerhead, self-installed	18,228	2%	93%	\$ 0.15
Steam system pipe insulation	14,957	1%	94%	\$ 0.07
Water heater pipe insulation	13,317	1%	96%	\$ 0.28
Duct sealing /insulation	9,122	1%	96%	\$ 0.36
Swimming pools –covers	7,485	1%	97%	\$ 0.43
Condensing Storage water heater	6,889	1%	98%	\$ 0.37
Clothes Washer Recycling	4,944	0%	98%	\$ 0.19

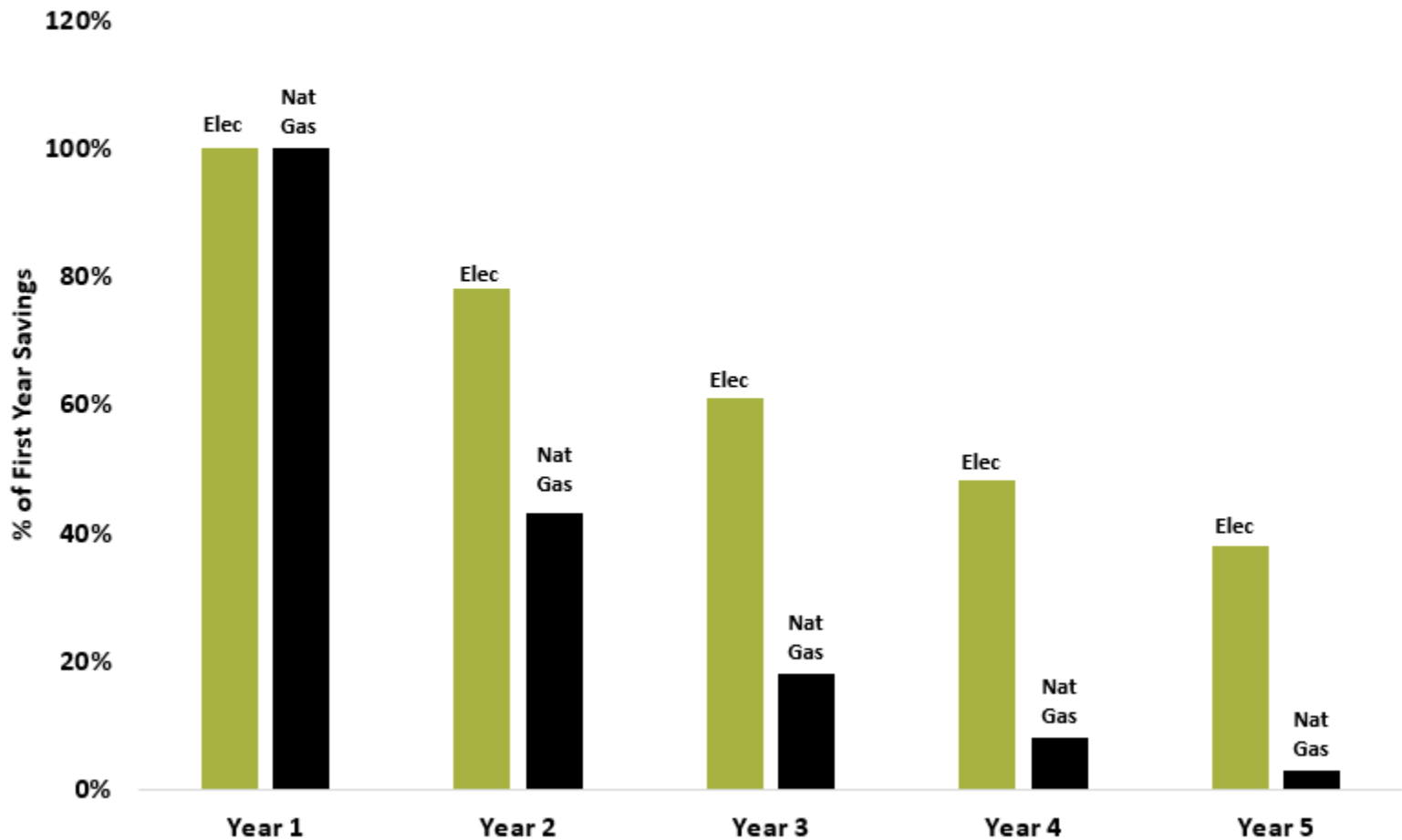
Description of Measure	therms savings	% of total	cumulative % of total	cost of energy saved
New Construction Programs	528,182	17%	17%	\$ 0.35
Variable Flow Kitchen Exhaust	235,023	8%	25%	\$ 0.02
Demand Control Ventilation	217,042	7%	32%	\$ 0.10
Chemical Sanitizing (Low Temp) Dishwashin	117,391	4%	36%	\$ 0.09
HE Rooftop Units	116,266	4%	39%	\$ 0.27
Steam Trap Maintenance Program	101,785	3%	43%	\$ 0.10
HE Dishwashers	101,086	3%	46%	\$ 0.08
HE Storage Tank Water Heaters	92,387	3%	49%	\$ 0.24
CAV to VAV retrofit	92,051	3%	52%	\$ 0.22
HE Furnaces (<=300kBTU)	87,253	3%	55%	\$ 0.12
VAV system controls	78,636	3%	57%	\$ 0.19
HE Boilers (Condensing)	65,330	2%	59%	\$ 0.30
Retrocommisioning	63,706	2%	61%	\$ 0.44
HE Boilers (Condensing)	58,709	2%	63%	\$ 0.10
Heat Recovery - Refrigeration	55,925	2%	65%	\$ 0.44

Description of Measure	therms savings	% of total	cumulative % of total	cost of energy saved
New Construction Programs	98,394	14%	14%	\$ 0.35
Demand Control Ventilation	57,257	8%	23%	\$ 0.10
Variable Flow Kitchen Exhaust	48,707	7%	30%	\$ 0.02
HE Rooftop Units	43,736	6%	36%	\$ 0.27
Retrocommissioning	27,829	4%	40%	\$ 0.44
Radiant Tube Heaters	21,514	3%	43%	\$ 0.43
HE Furnaces (<=300kBTU)	20,514	3%	46%	\$ 0.12
Chemical Sanitizing (Low Temp) Dishwashin	19,818	3%	49%	\$ 0.09
Heat Recovery - Refrigeration	19,081	3%	52%	\$ 0.44
HE Dishwashers	17,065	2%	55%	\$ 0.08
HE Boilers (Condensing)	15,999	2%	57%	\$ 0.12
Condensing Unit Heater	14,921	2%	59%	\$ 0.29
HE Storage Tank Water Heaters	14,770	2%	61%	\$ 0.22
VAV system controls	13,793	2%	63%	\$ 0.19
Steam Trap Maintenance Program	12,950	2%	65%	\$ 0.10

KEY ISSUES

Home Energy Reports

Assumed Electricity and Natural Gas Savings Associated With One Year of Reports (After TRM Update)



DECILE ANALYSIS

Peoples Gas				
Decile	No of Customers	Average Use	Total Use	% of Total
1	63,390	2,407	152,575,927	22%
2	63,380	1,672	106,000,515	15%
3	63,380	1,417	89,818,967	13%
4	63,390	1,236	78,319,613	11%
5	63,380	1,082	68,603,780	10%
6	63,380	933	59,160,160	9%
7	63,390	781	49,522,170	7%
8	63,380	622	39,413,487	6%
9	63,380	451	28,569,169	4%
10	63,380	206	13,085,435	2%
Total	633,830		685,069,221	100%

North Shore Gas				
Decile	No of Customers	Average Use	Total Use	% of Total
1	14,489	3,411	49,421,110	25%
2	14,489	1,918	27,788,018	14%
3	14,488	1,576	22,830,335	12%
4	14,489	1,371	19,857,319	10%
5	14,488	1,218	17,643,052	9%
6	14,489	1,085	15,726,940	8%
7	14,488	962	13,944,555	7%
8	14,489	837	12,122,801	6%
9	14,488	683	9,898,202	5%
10	14,488	354	5,132,229	3%
Total	144,885		194,364,562	100%

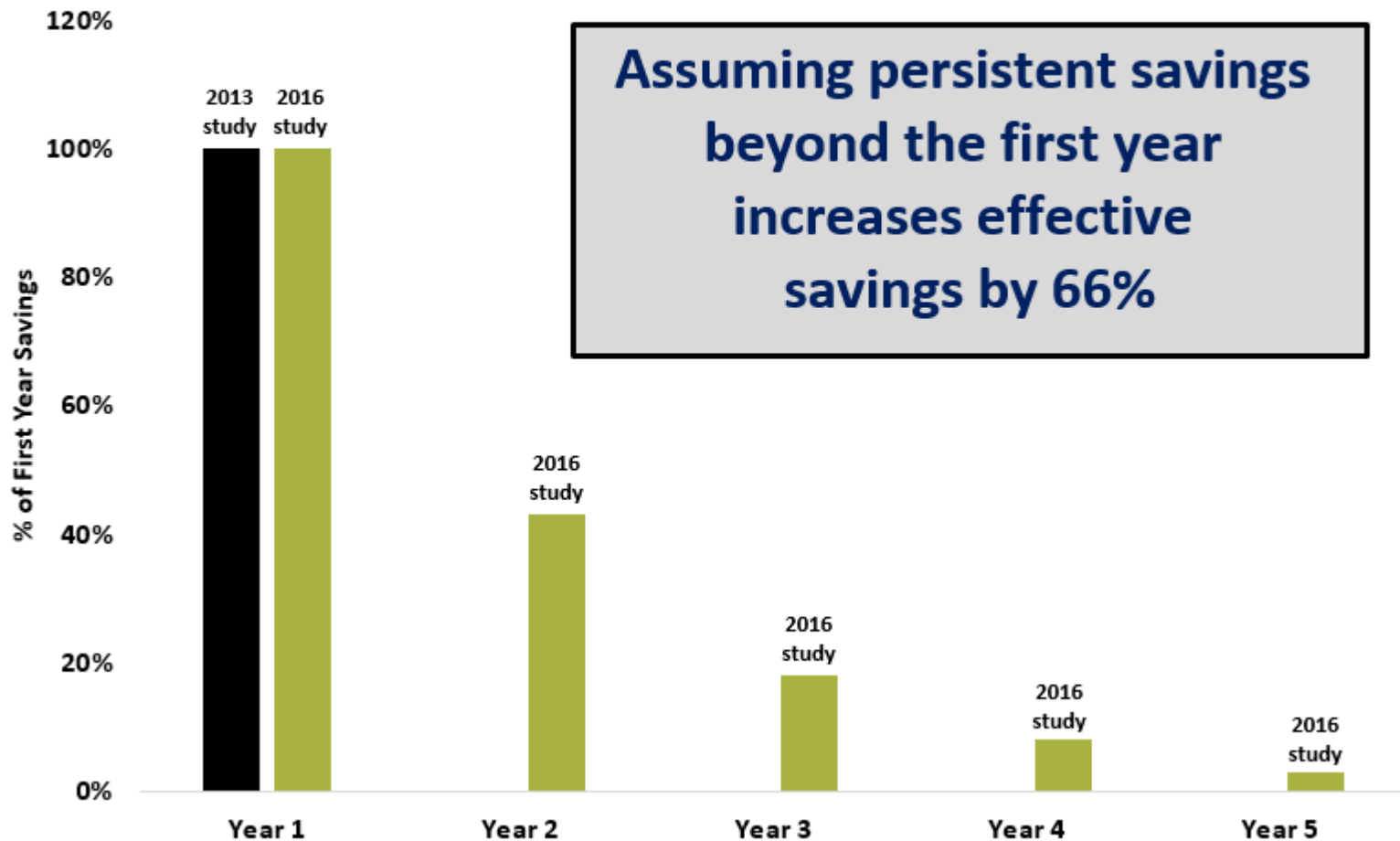
approach applied before TRM update
(only one year of savings per report cycle)

Peoples Gas			
Decile	Annual Report Cost	Therms Saved	Cost of Energy Saved
1	\$ 5.75	26	\$ 0.22
2	\$ 5.75	17	\$ 0.34
3	\$ 5.75	13	\$ 0.45
4	\$ 5.75	10	\$ 0.58
5	\$ 5.75	8	\$ 0.76
6	\$ 5.75	6	\$ 1.03
7	\$ 5.75	4	\$ 1.47
8	\$ 5.75	2	\$ 2.31
9	\$ 5.75	1	\$ 4.25
10	\$ 5.75	0	\$ 13.93

North Shore Gas			
Decile	Annual Report Cost	Therms Saved	Cost of Energy Saved
1	\$ 6.87	35	\$ 0.20
2	\$ 6.87	18	\$ 0.39
3	\$ 6.87	13	\$ 0.53
4	\$ 6.87	10	\$ 0.69
5	\$ 6.87	8	\$ 0.90
6	\$ 6.87	6	\$ 1.19
7	\$ 6.87	4	\$ 1.66
8	\$ 6.87	3	\$ 2.49
9	\$ 6.87	2	\$ 4.37
10	\$ 6.87	0	\$ 14.92

Home Energy Reports

Assumed Natural Gas Savings Associated With One Year of Reports Before and After TRM Update



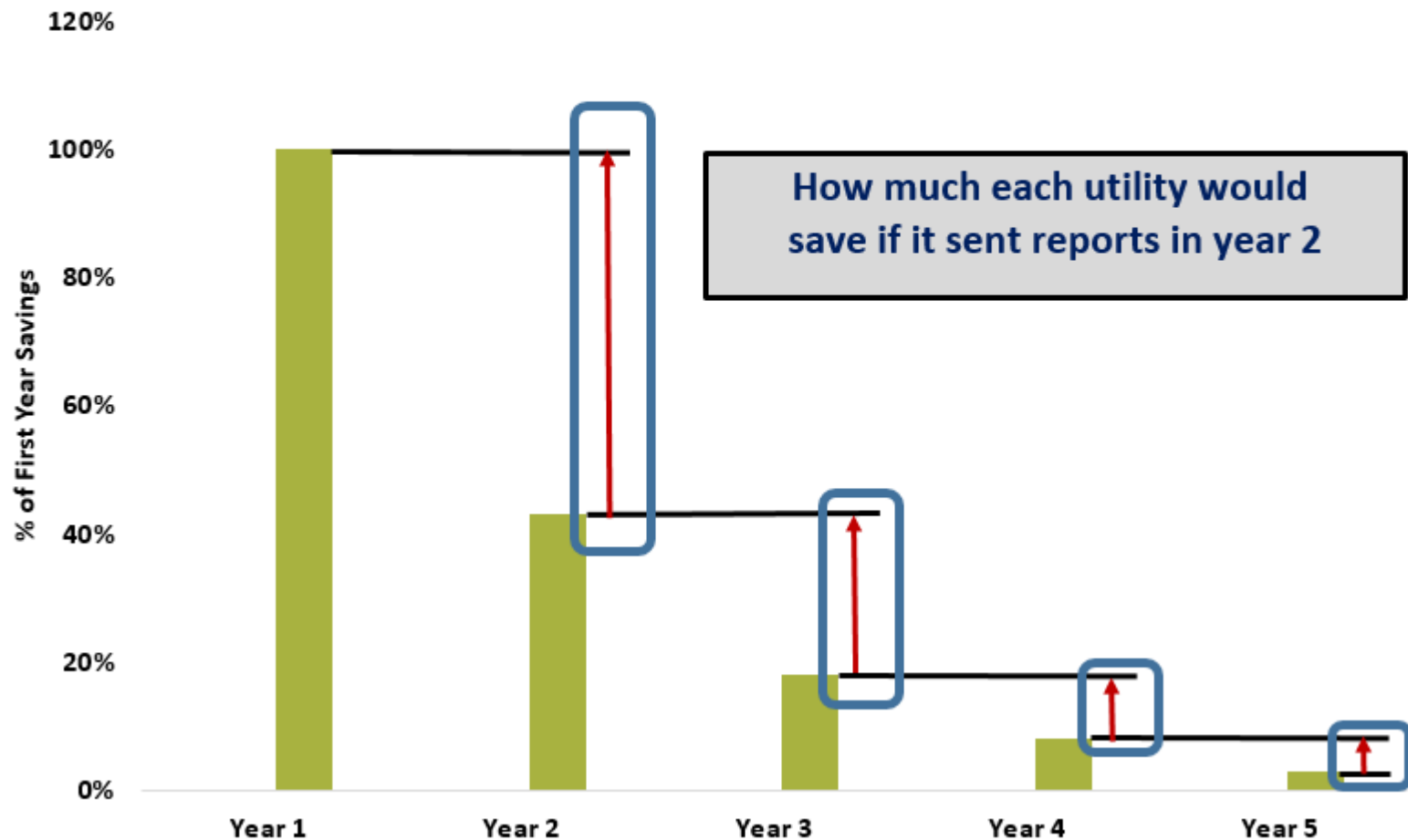
approach applied after TRM update
(first year-fresh start with decayed savings)

Peoples Gas			
Decile	Annual Report Cost	Therms Saved	Cost of Energy Saved
1	\$ 5.75	44	\$ 0.13
2	\$ 5.75	28	\$ 0.21
3	\$ 5.75	21	\$ 0.27
4	\$ 5.75	16	\$ 0.35
5	\$ 5.75	13	\$ 0.46
6	\$ 5.75	9	\$ 0.62
7	\$ 5.75	7	\$ 0.88
8	\$ 5.75	4	\$ 1.39
9	\$ 5.75	2	\$ 2.55
10	\$ 5.75	1	\$ 8.37

North Shore Gas			
Decile	Annual Report Cost	Therms Saved	Cost of Energy Saved
1	\$ 6.87	58	\$ 0.12
2	\$ 6.87	30	\$ 0.23
3	\$ 6.87	22	\$ 0.32
4	\$ 6.87	17	\$ 0.41
5	\$ 6.87	13	\$ 0.54
6	\$ 6.87	10	\$ 0.72
7	\$ 6.87	7	\$ 1.00
8	\$ 6.87	5	\$ 1.50
9	\$ 6.87	3	\$ 2.63
10	\$ 6.87	1	\$ 8.96

Home Energy Reports

Assumed Natural Gas Savings Associated With Two Year of Reports



approach applied after TRM update
(second year-avoid decay)

Peoples Gas			
Decile	Annual Report Cost	Therms Saved	Cost of Energy Saved
1	\$ 5.75	25	\$ 0.23
2	\$ 5.75	16	\$ 0.36
3	\$ 5.75	12	\$ 0.48
4	\$ 5.75	9	\$ 0.61
5	\$ 5.75	7	\$ 0.80
6	\$ 5.75	5	\$ 1.08
7	\$ 5.75	4	\$ 1.55
8	\$ 5.75	2	\$ 2.44
9	\$ 5.75	1	\$ 4.48
10	\$ 5.75	0	\$ 14.68

North Shore Gas			
Decile	Annual Report Cost	Therms Saved	Cost of Energy Saved
1	\$ 6.87	33	\$ 0.21
2	\$ 6.87	17	\$ 0.41
3	\$ 6.87	12	\$ 0.55
4	\$ 6.87	9	\$ 0.72
5	\$ 6.87	7	\$ 0.94
6	\$ 6.87	5	\$ 1.26
7	\$ 6.87	4	\$ 1.75
8	\$ 6.87	3	\$ 2.62
9	\$ 6.87	1	\$ 4.61
10	\$ 6.87	0	\$ 15.73

26 therms
annual savings

5 year
estimated life

44 effective
total therms

\$5.75
annual
report cost

\$5.75 / 44 therms

\$0.13 per therm

26 therms
annual savings

5 year
estimated life

44 effective
total therms

\$5.75
annual
report cost

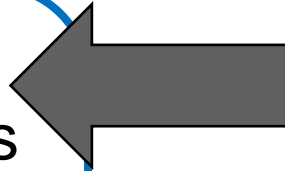
$\$5.75 / 44$ therms

\$0.13 per therm

15 therms
annual savings

5 year
estimated life

25 effective
total therms



\$5.75
annual
report cost

$\$5.75 / 25$ therms

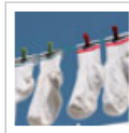
\$0.23 per therm



Heating_Reduction = Assumed percentage reduction in total household heating energy consumption due to advanced thermostat

Existing Thermostat Type	Heating_Reduction ⁴⁴⁷
Manual	8.8%
Programmable	5.6%
Unknown (Blended)	7.4%

Personalized energy saving tips:



Hang laundry to dry

A typical clothes dryer uses up to four times more energy than a new clothes washer. Hang-drying saves energy and reduces wear and tear on clothes, which helps them last longer.

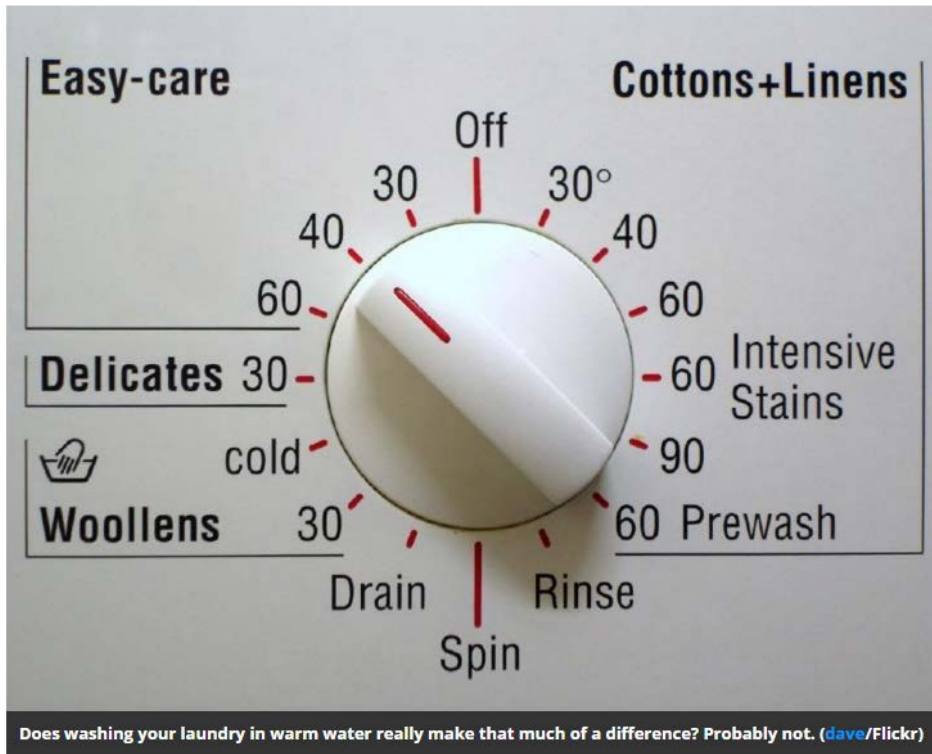
Save up to \$15 per year

Source: Opower

SMARTNEWS *Keeping you current*

The Case for Washing Clothes in Cold Water

Laundry: You're doing it wrong

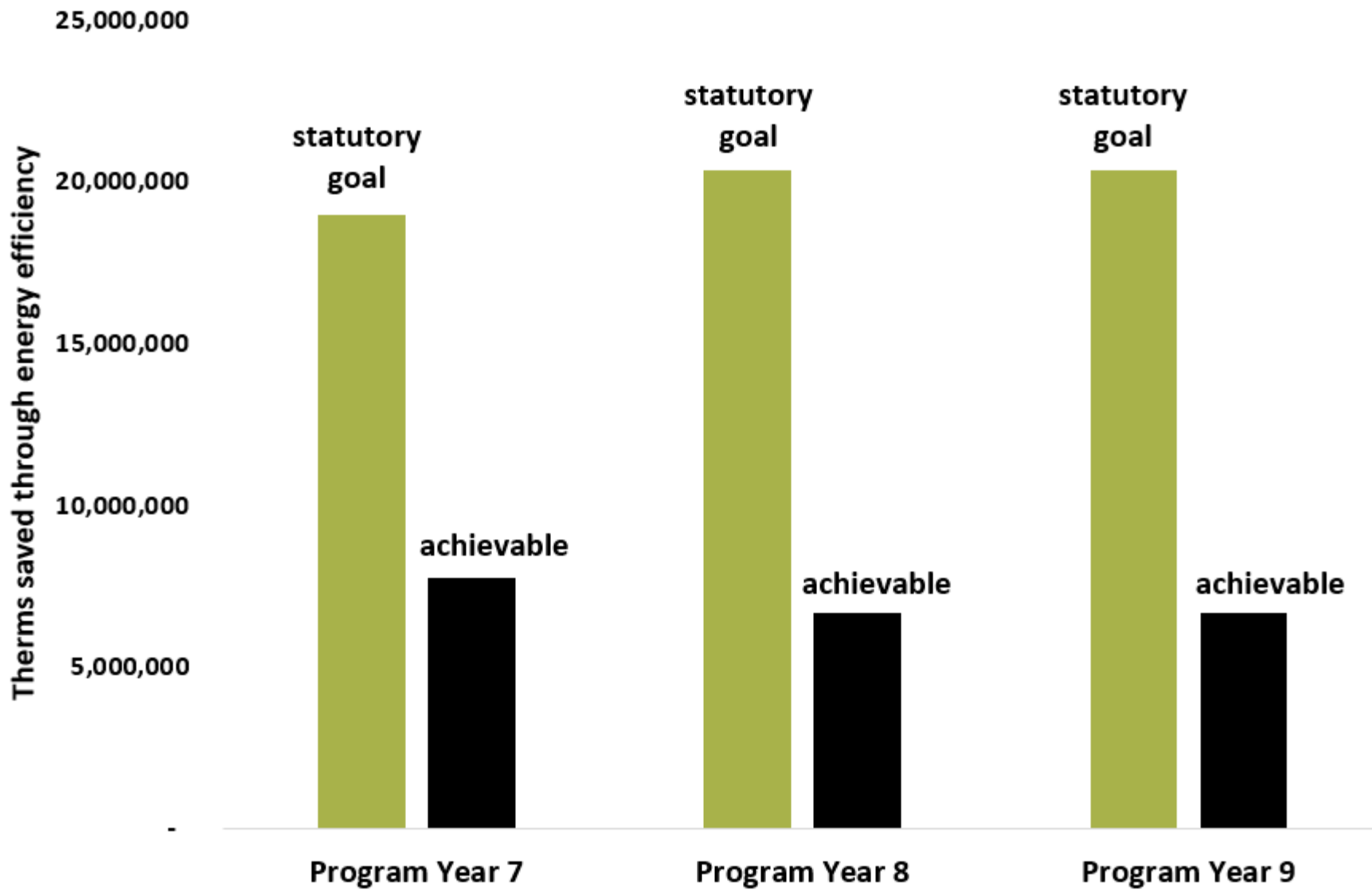


Source: Smithsonian.com

SUMMARY

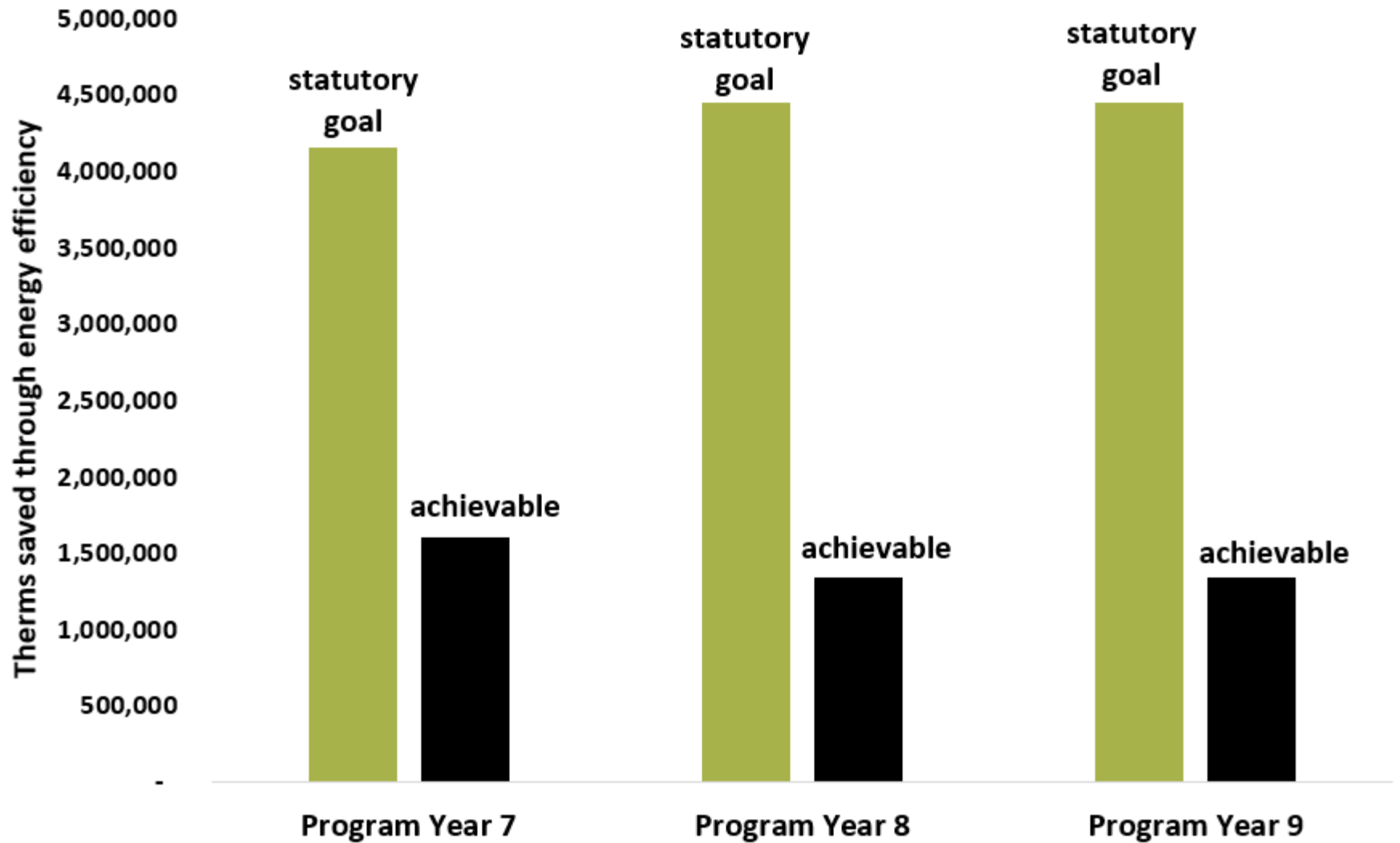
Peoples Gas

Statutory Goals and Achievable Potential by Program Year



North Shore Gas

Statutory Goals and Achievable Potential by Program Year (limited by budget cap)





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