



Presentation to the Stakeholder Advisory Group

WASTED ENERGY STUDY

PRELIMINARY RESULTS

October 28, 2014

**PROJECT
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technological measures



behavior change



TOPICS

BEHAVIORAL APPROACH

RESIDENTIAL

Thermostat setback

Heating system maintenance

Water heater temperature setpoint

Clothes washer temperature settings

COMMERCIAL

Thermostat setback

Heating system maintenance



2,892 phone surveys



174 site visits

other Energy Center Midwest field studies
Energy Center building energy use modeling
secondary research

ACHIEVABLE POTENTIAL

 <p>PEOPLES GAS NATURAL GAS SAVINGS PROGRAM REDUCE TODAY. SAVE TOMORROW.</p>	<p>6 million therms</p>
 <p>NORTH SHORE GAS NATURAL GAS SAVINGS PROGRAM REDUCE TODAY. SAVE TOMORROW.</p>	<p>2 million therms</p>



Ceiling Insulation

Wall Insulation

Floor Insulation

Rim Joist Insulation

Foundation Insulation

Air Sealing

Window Replacement

Heating System Replacement (Furnace or Boiler)

Duct Sealing/Insulation

Boiler Pipe Insulation

Boiler Vent Damper

Steam-to-Hot-Water Boiler Conversion



Air Seal Furnaces

Heat Recovery (Combustion Air Preheating, Load Preheating, External Processes)

Furnace Insulation

Lower Flammable Limit Monitoring Equipment

Tune Burner Air to Fuel Ratios

O₂-Enriched Combustion

Clean/Repair Heat Transfer Surfaces

Process Heat Custom Efficiency Measure

Boiler Tune-Ups

Insulate Pipes/Lines

Steam Trap Maintenance Program

O₂-Trim

HE Boilers

first



second



first



second



first



BEFORE

second



first

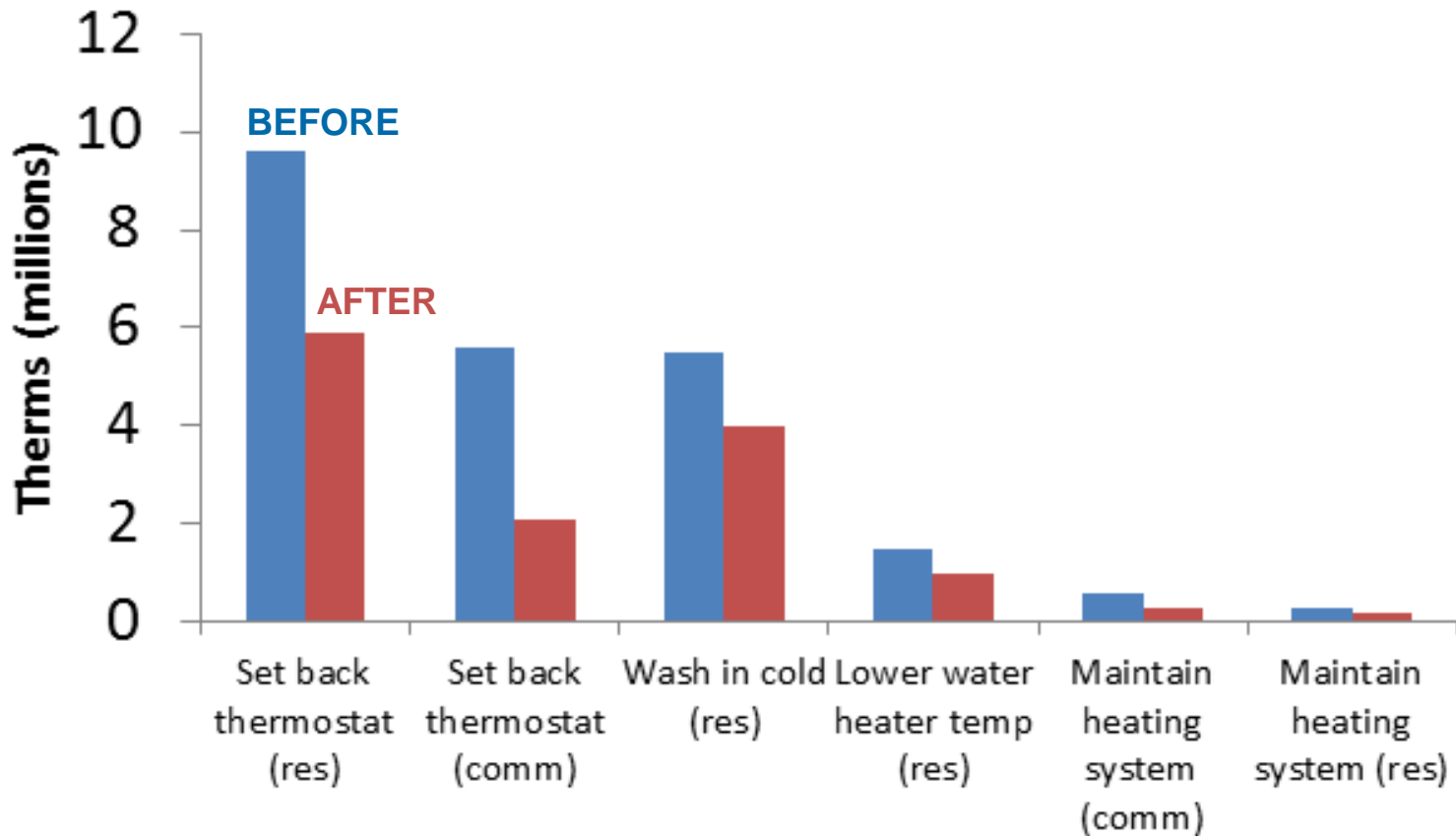


AFTER

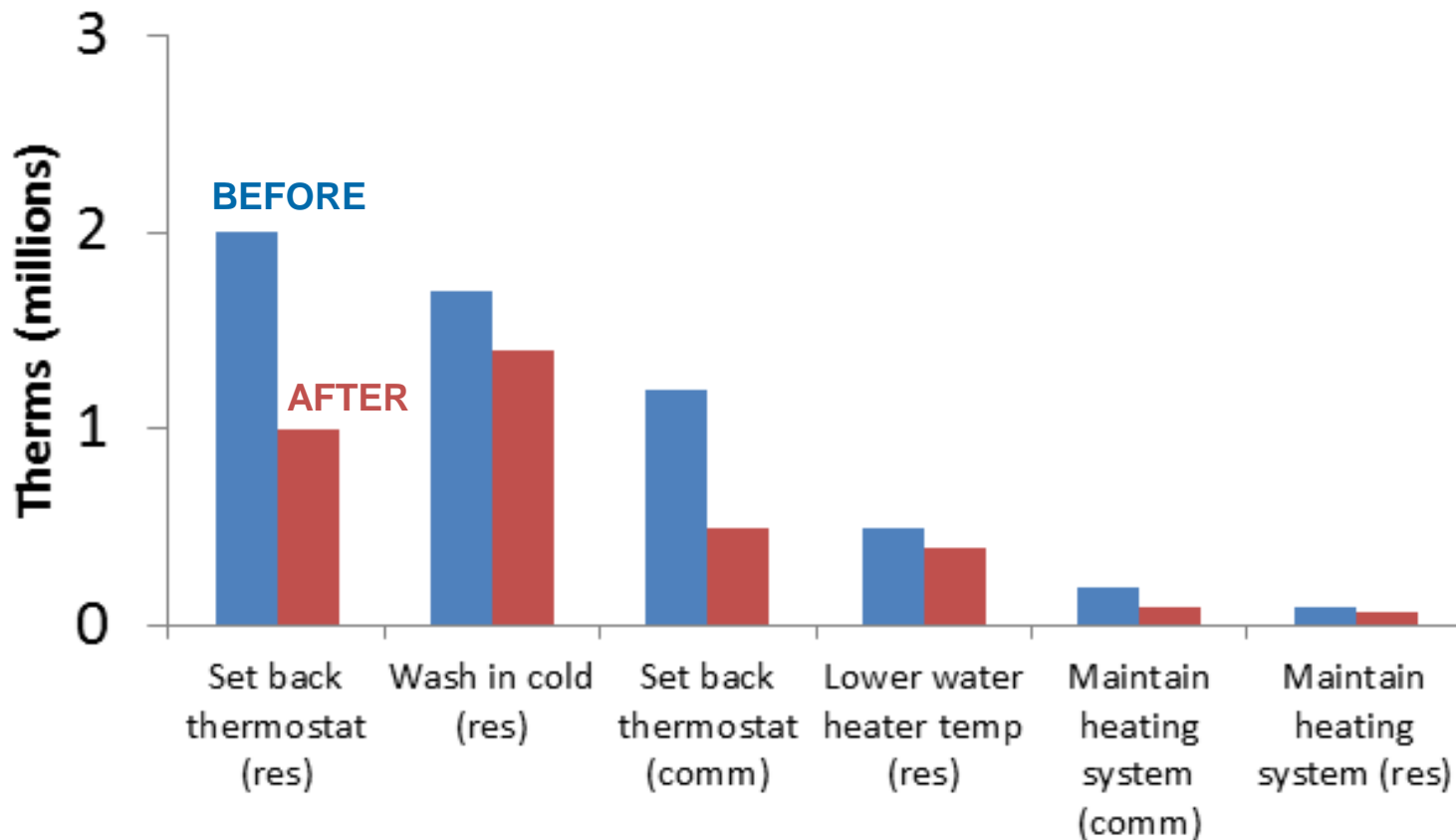
second



Peoples Gas Summary of Wasted Energy Opportunities (before and after other technical potential)





North Shore Gas Summary of Wasted Energy Opportunities (before and after other technical potential)



RESIDENTIAL



	% OF TOTAL THERMS	
	SPACE HEATING	WATER HEATING
 <p>PEOPLES GAS NATURAL GAS SAVINGS PROGRAM REDUCE TODAY. SAVE TOMORROW.</p>	75%	20%
 <p>NORTH SHORE GAS NATURAL GAS SAVINGS PROGRAM REDUCE TODAY. SAVE TOMORROW.</p>	71%	21%

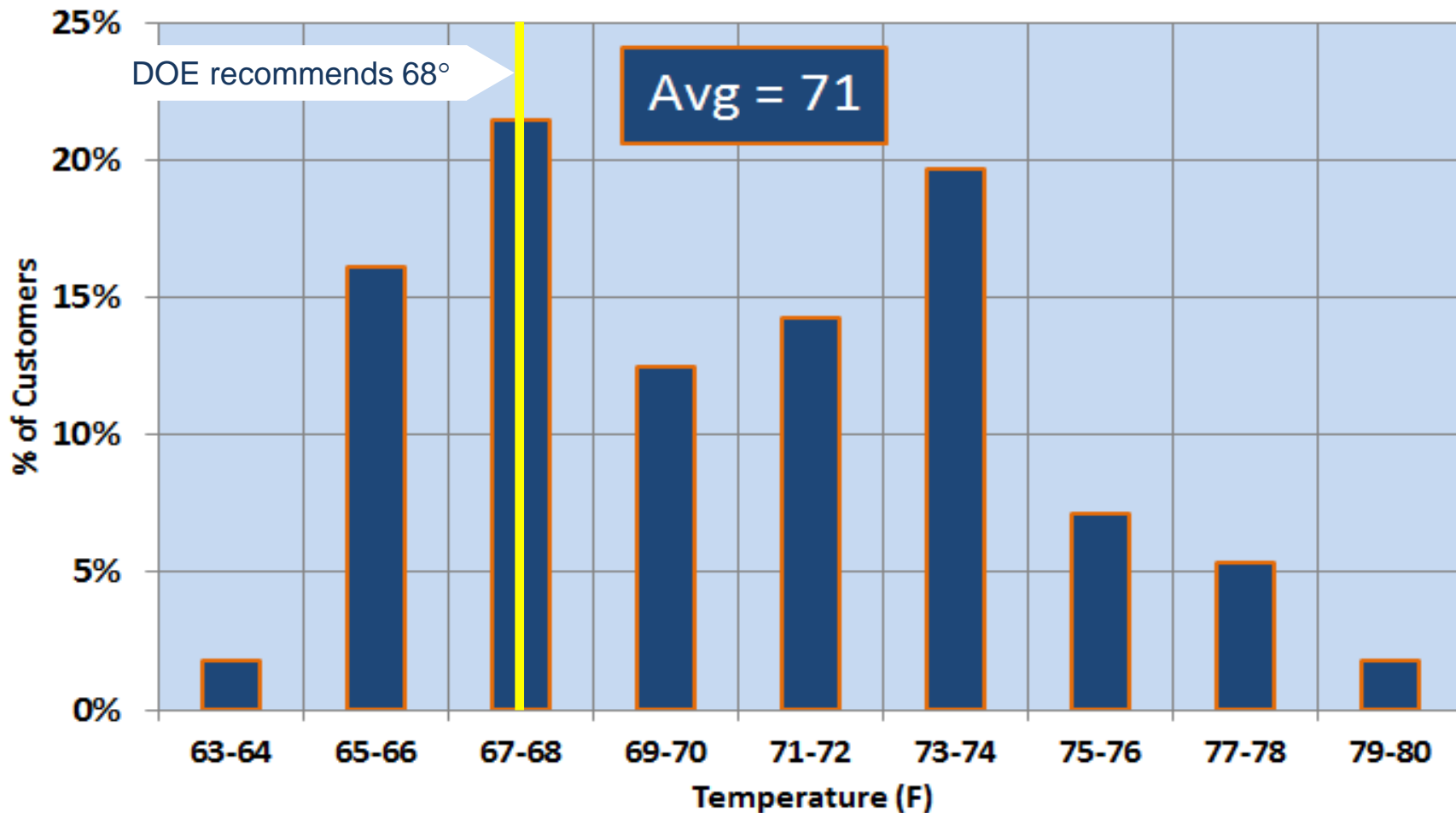
RESIDENTIAL THERMOSTAT SETBACK

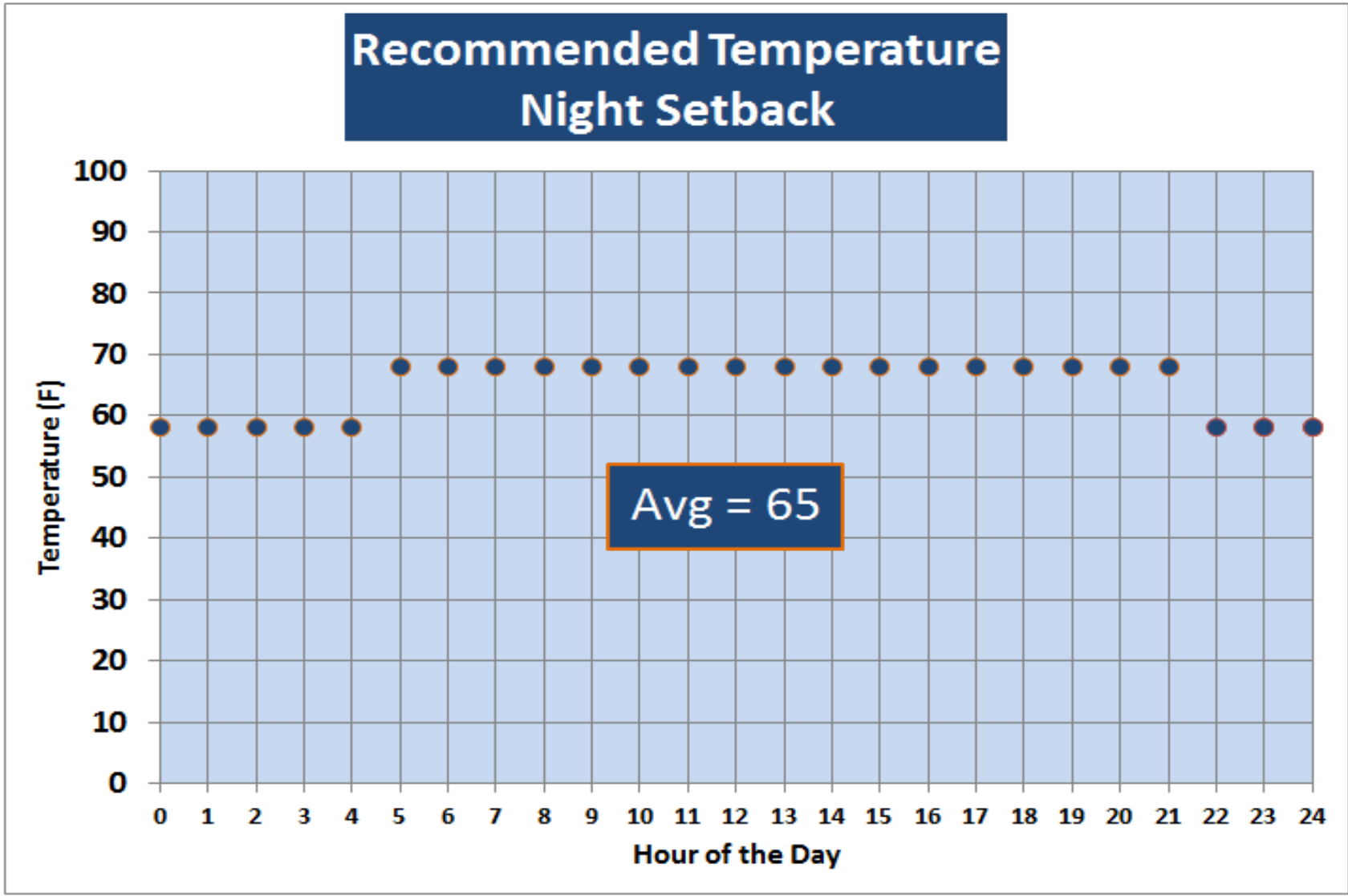
MANUAL • PROGRAMMABLE • SMART





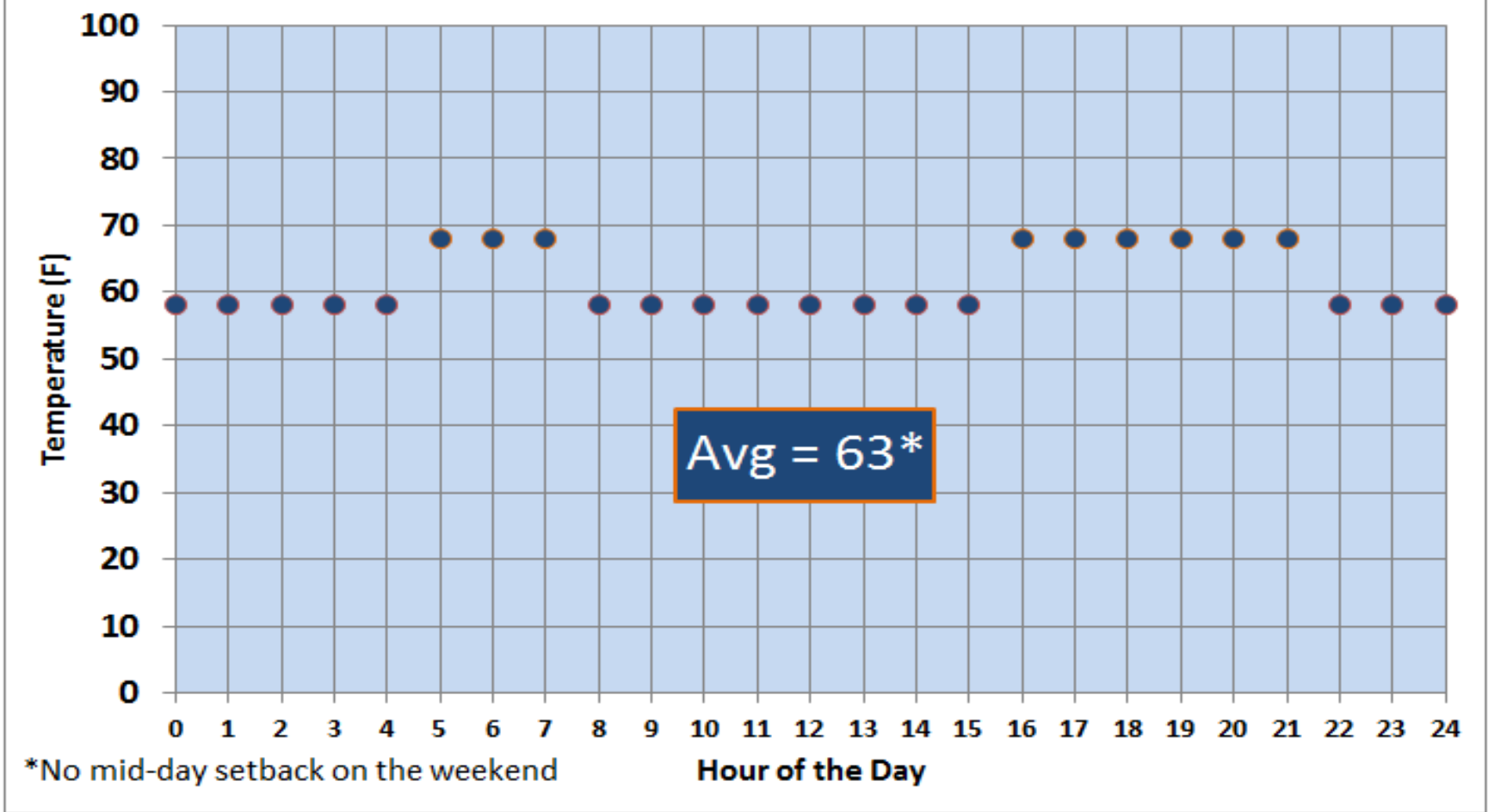
Peoples Gas/North Shore Gas Observed Average Daily Temperatures





As recommended by DOE

Recommended Temperature Night and Away Setback

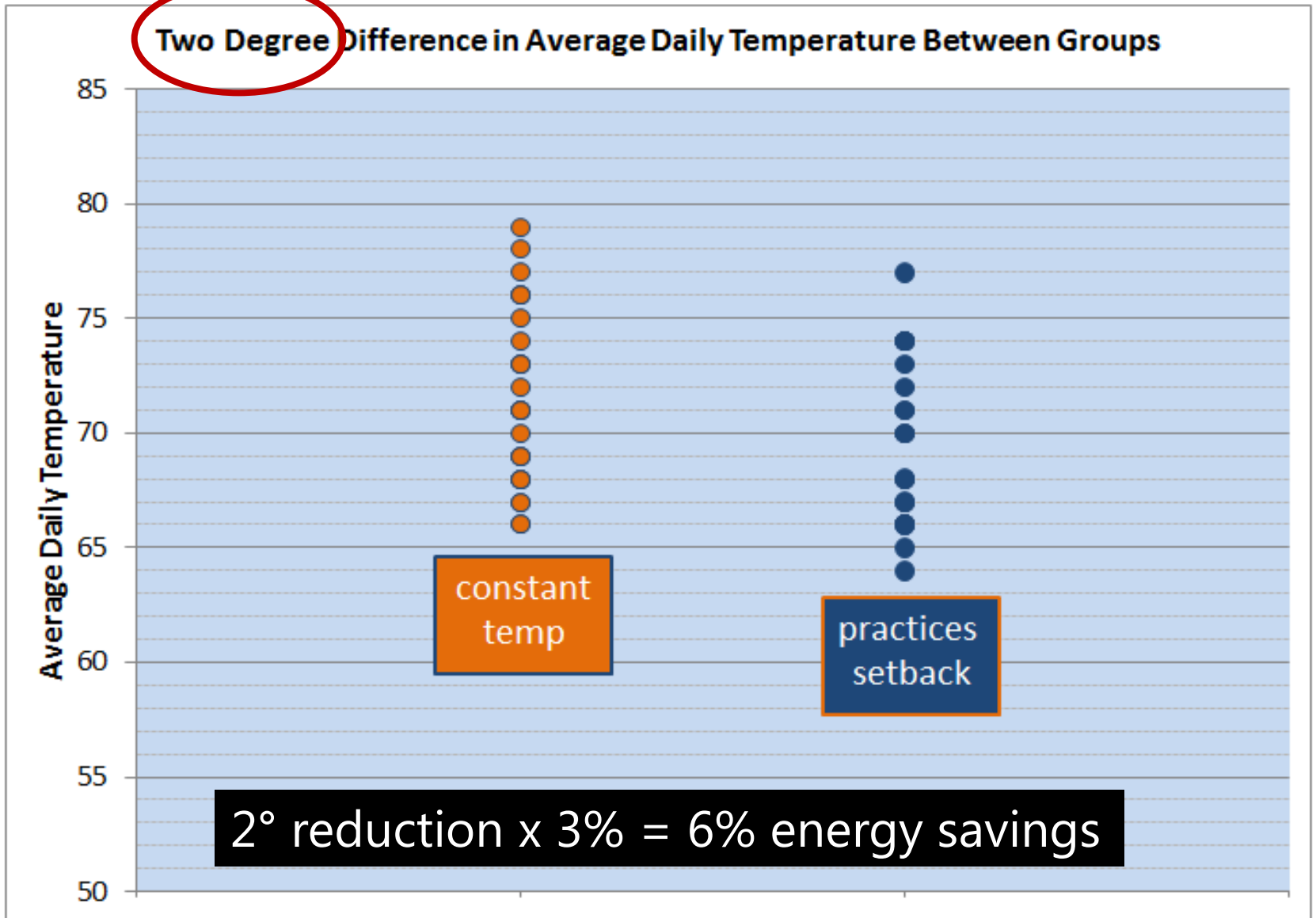


As recommended by DOE



site visits

We found a **2-degree difference** in average daily temperature between the group of customers setting back and the group not setting back.



U.S. Department of Energy

Energy Savings

1° reduction in average daily temp

3% reduction in consumption

<http://energy.gov/energysaver/articles/thermostats>



Technical Reference Manual

6%

Massachusetts study (smart thermostat)

10%

PEOPLES GAS

TYPE	SPACE HEATING LOAD (THERMS)	CUSTOMERS NOT SETTING BACK THERMOSTATS	AVAILABLE LOAD (THERMS)
Single-family	261,585,957	35%	91,555,085
Multi-family	108,944,724	63%	68,635,176

NORTH SHORE GAS

TYPE	SPACE HEATING LOAD (THERMS)	CUSTOMERS NOT SETTING BACK THERMOSTATS	AVAILABLE LOAD (THERMS)
Single-family	123,413,232	25%	30,853,308
Multi-family	4,779,639	44%	2,103,041

PEOPLES GAS

TYPE	AVAILABLE LOAD (THERMS)	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	91,555,085	6%	5,493,305
Multi-family	68,635,176	6%	4,118,111
TOTAL			9,611,416

NORTH SHORE GAS

TYPE	AVAILABLE LOAD (THERMS)	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	30,853,308	6%	1,851,198
Multi-family	2,103,041	6%	126,182
TOTAL			1,977,381

PEOPLES GAS

TYPE	AVAILABLE LOAD (THERMS)	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	91,555,085	10%	9,155,508
Multi-family	68,635,176	10%	6,863,518
TOTAL			16,019,026

NORTH SHORE GAS

TYPE	AVAILABLE LOAD (THERMS)	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	30,853,308	10%	3,085,331
Multi-family	2,103,041	10%	210,304
TOTAL			3,295,635

first



second



first



second



PEOPLES GAS

TYPE	AVAILABLE THERMS (BEFORE)	TECHNICAL POTENTIAL SAVINGS	AVAILABLE THERMS (AFTER)
Single-family	91,555,085	42%	53,101,949
Multi-family	68,635,176	34%	45,299,216

NORTH SHORE GAS

TYPE	AVAILABLE THERMS (BEFORE)	TECHNICAL POTENTIAL SAVINGS	AVAILABLE THERMS (AFTER)
Single-family	30,853,308	47%	16,352,253
Multi-family	2,103,041	61%	820,186

PEOPLES GAS (after technical potential)

TYPE	AVAILABLE THERMS	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	53,101,949	6%	3,186,117
Multi-family	45,299,216	6%	2,717,953
TOTAL			5,904,070

NORTH SHORE GAS (after technical potential)

TYPE	AVAILABLE THERMS	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	16,352,253	6%	981,135
Multi-family	820,186	6%	49,211
TOTAL			1,030,346

PEOPLES GAS (after technical potential)

TYPE	AVAILABLE THERMS	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	53,101,949	10%	5,310,195
Multi-family	45,299,216	10%	4,529,922
TOTAL			9,840,117

NORTH SHORE GAS (after technical potential)

TYPE	AVAILABLE THERMS	SAVINGS FACTOR	SPACE HEATING LOAD (THERMS)
Single-family	16,352,253	10%	1,635,225
Multi-family	820,186	10%	82,019
TOTAL			1,717,244

PEOPLES GAS

BEFORE TECHNICAL POTENTIAL

AFTER TECHNICAL POTENTIAL

6% savings

10% savings

6% savings

10% savings

10 million

16 million

6 million

10 million

NORTH SHORE GAS

BEFORE TECHNICAL POTENTIAL

AFTER TECHNICAL POTENTIAL

6% savings

10% savings

6% savings

10% savings

2 million

3 million

1 million

2 million

COMMERCIAL THERMOSTAT SETBACK



Savings from thermostat setback

PEOPLES GAS		
SEGMENT	SPACE HEATING USE (THERMS)	THERM SAVINGS
Small office	14,009,711	1,082,773
Large office	31,241,157	2,206,778
Food sales	2,767,857	17,828
Food service	13,359,962	86,051
Retail	9,042,945	403,768
Private education	11,005,525	815,557
Religious	14,390,292	534,558
Other health care	2,732,507	389,781
Service	21,591,652	89,025
Lodging	22,119,739	5,078
	TOTAL	5,631,197

NORTH SHORE GAS

SEGMENT	SPACE HEATING USE (THERMS)	THERM SAVINGS
Small office	4,321,083	333,965
Large office	2,776,159	196,099
Food sales	441,552	2,844
Food service	1,771,012	11,407
Retail	6,680,216	298,272
Private education	2,187,821	162,127
Religious	3,523,970	130,905
Other health care	984,128	140,382
Service	4,544,542	18,738
Lodging	2,345,935	539
	TOTAL	1,295,278

Savings from thermostat setback

PEOPLES GAS (after technical potential)	
SEGMENT	THERM SAVINGS
Small office	389,798
Large office	750,305
Food sales	7,309
Food service	36,141
Retail	266,487
Private education	489,334
Religious	347,463
Other health care	167,606
Service	47,183
Lodging	3,453
TOTAL	2,115,281

Savings from thermostat setback

NORTH SHORE GAS (after technical potential)	
SEGMENT	THERM SAVINGS
Small office	120,227
Large office	66,674
Food sales	1,194
Food service	5,019
Retail	205,808
Private education	94,034
Religious	82,470
Other health care	63,172
Service	11,805
Lodging	345
TOTAL	530,521

PEOPLES GAS

BEFORE TECHNICAL POTENTIAL

6 million

AFTER TECHNICAL POTENTIAL

2 million

NORTH SHORE GAS

BEFORE TECHNICAL POTENTIAL

1 million

AFTER TECHNICAL POTENTIAL

0.5 million

RESIDENTIAL CLOTHES WASHER TEMPERATURE SETTINGS





PEOPLES GAS

INDIVIDUALLY METERED	WASHING IN HOT	WASHING IN WARM	WASHING IN COLD
Single-family	83,653	112,909	31,999
Multi-family	66,005	89,088	25,248

NORTH SHORE GAS

INDIVIDUALLY METERED	WASHING IN HOT	WASHING IN WARM	WASHING IN COLD
Single-family	42,187	56,941	16,137
Multi-family	4,289	5,789	1,641



PEOPLES GAS

INDIVIDUALLY METERED	WASHING IN HOT (therms)	WASHING IN WARM (therms)	TOTAL (therms)
Single-family	1,840,373	1,242,000	3,082,374
Multi-family	1,452,106	979,973	2,432,079
TOTAL			5,514,452



NORTH SHORE

INDIVIDUALLY METERED	WASHING IN HOT (therms)	WASHING IN WARM (therms)	TOTAL (therms)
Single-family	928,114	626,350	1,554,464
Multi-family	94,353	63,676	158,029
		TOTAL	1,712,493

PEOPLES GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	3,082,374	2,435,075
Multi-family	2,432,079	1,605,172
TOTAL	5,514,452	4,040,248

NORTH SHORE GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	1,554,464	1,290,205
Multi-family	158,029	118,522
TOTAL	1,712,493	1,408,727

RESIDENTIAL HEATING SYSTEM MAINTENANCE

PROFESSIONAL SERVICE • FURNACE FILTERS





Photo: U.S. Department of Energy



Savings from boiler maintenance

PEOPLES GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	463,835	306,131
Multi-family	77,287	44,826
TOTAL	541,122	350,958

NORTH SHORE GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	115,304	61,111
Multi-family	2,881	1,124
TOTAL	118,185	62,235

Savings from replacing furnace filters

PEOPLES GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	177,793	103,120
Multi-family	89,826	59,285
TOTAL	267,618	162,405

NORTH SHORE GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	93,304	49,451
Multi-family	4,104	1,601
TOTAL	97,409	51,052

RESIDENTIAL WATER HEATER TEMPERATURE SETPOINT





PEOPLES GAS

INDIVIDUALLY METERED	TOTAL PREMISES	% ABOVE 120° F	APPLICABLE PREMISES	ANNUAL SAVINGS (therms)
Single-family	228,561	64%	146,279	819,162
Multi-family	180,341	64%	115,418	646,341
			TOTAL	1,465,503

NORTH SHORE GAS

INDIVIDUALLY METERED	TOTAL PREMISES	% ABOVE 120° F	APPLICABLE PREMISES	ANNUAL SAVINGS (therms)
Single-family	115,265	64%	73,770	413,112
Multi-family	11,718	64%	7,500	42,000
			TOTAL	455,112



PEOPLES GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	819,162	647,138
Multi-family	646,341	426,585
TOTAL	1,465,503	1,073,723

NORTH SHORE GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	413,112	342,883
Multi-family	42,000	31,500
TOTAL	455,112	374,383

COMMERCIAL HEATING SYSTEM MAINTENANCE



Savings from boiler tune-ups

PEOPLES GAS (before and after technical potential)

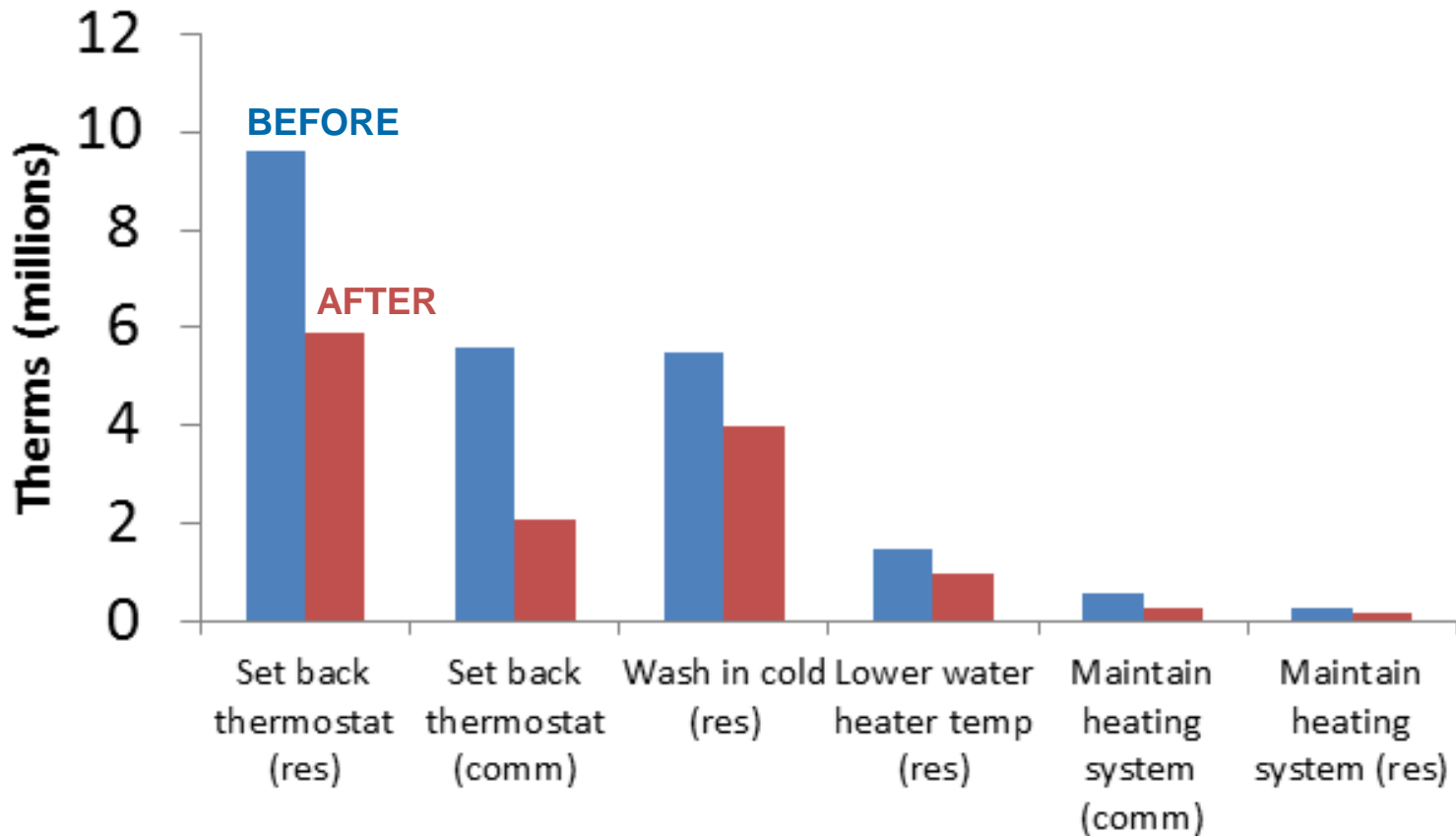
SEGMENT	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Small office	29,287	18,744
Large office	258,989	170,933
Food service	12,629	7,451
Private education	55,347	22,139
Religious	67,485	23,620
Other health care	8,537	4,866
Service	24,283	11,413
Lodging	178,042	56,973
TOTAL	634,600	316,139

Savings from boiler tune-ups

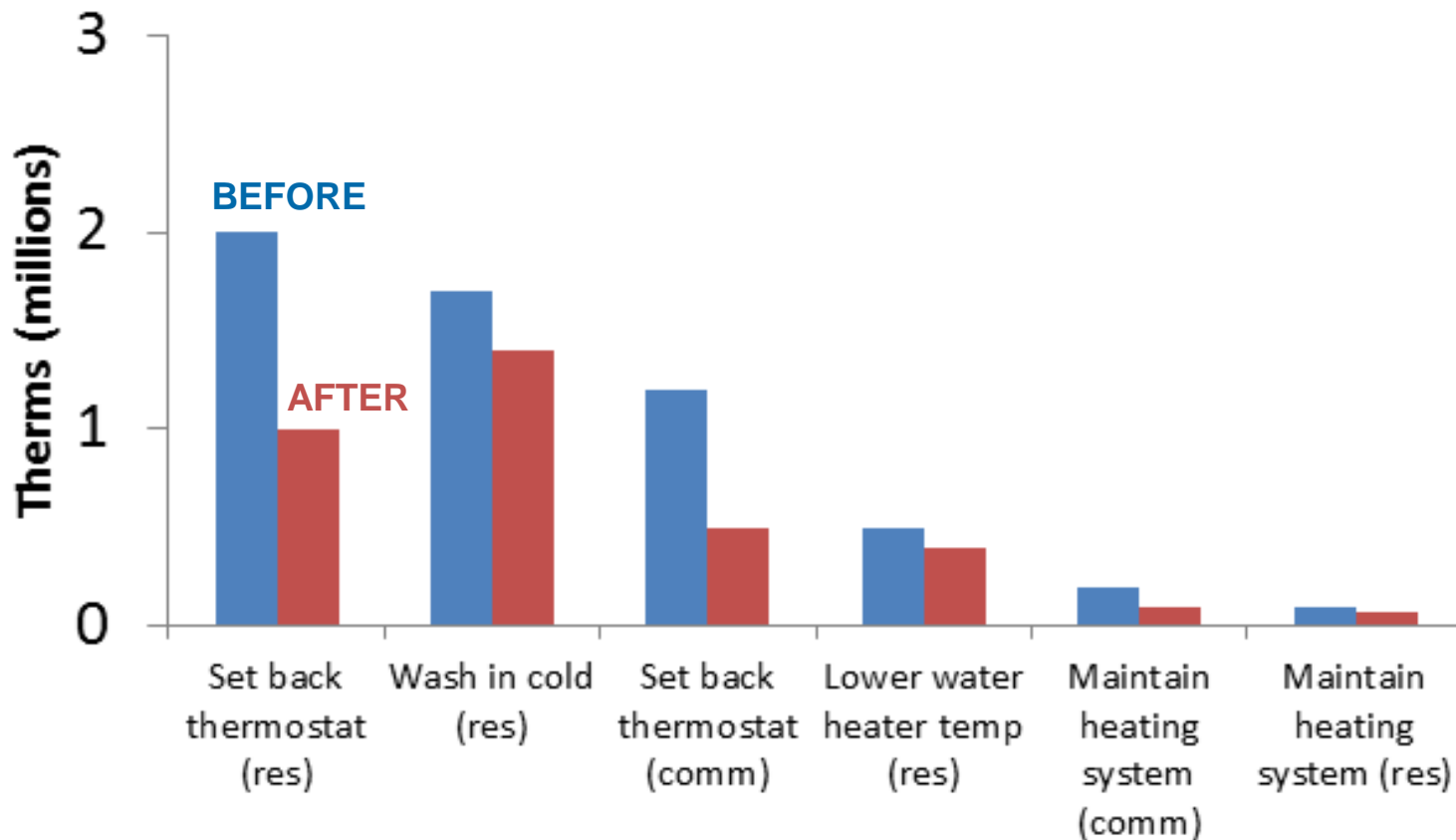
NORTH SHORE (before and after technical potential)

SEGMENT	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Small office	4,935	3,158
Large office	13,080	8,633
Food service	1,438	805
Private education	4,712	1,979
Religious	7,070	2,616
Other health care	11,239	6,181
Service	5,365	1,985
Lodging	10,055	3,620
TOTAL	67,375	28,978

Peoples Gas Summary of Wasted Energy Opportunities (before and after other technical potential)



North Shore Gas Summary of Wasted Energy Opportunities (before and after other technical potential)



QUESTIONS?



APPENDICES



Savings from line drying of clothes

PEOPLES GAS

INDIVIDUALLY METERED	PREMISES WITH GAS DRYER	GAS DRYER USE IN WARM WEATHER (therms)	TOTAL SAVINGS (therms)
Single-family	194,878	26	5,066,828

NORTH SHORE GAS

INDIVIDUALLY METERED	PREMISES WITH GAS DRYER	GAS DRYER USE IN WARM WEATHER (therms)	TOTAL SAVINGS (therms)
Single-family	93,876	26	2,440,776

Savings from line drying of clothes

PEOPLES GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	5,066,828	4,661,482

NORTH SHORE GAS (before and after technical potential)

INDIVIDUALLY METERED	THERM SAVINGS (BEFORE)	THERM SAVINGS (AFTER)
Single-family	2,440,776	2,294,329

“How often do you usually get your heating system serviced professionally?”

	% RESPONDENTS
More often than annually	3.2%
Annually	32.8%
Every couple of years	22.5%
Every 3-5 years	11.8%
Irregular schedule	22.2%
Never	7.6%
(‘don’t know’ and ‘refused’ excluded)	-

Candidates for maintenance = ½ the homes in the 3-5 year category, and those in the irregular and never categories approx 30%

Savings from boiler maintenance

PEOPLES GAS

INDIVIDUALLY METERED	SPACE HEATING USE (THERMS)	% NOT PERFORMING REGULAR MAINTENANCE	APPLICABLE THERMS	THERM SAVINGS
Single-family	77,305,897	30%	23,191,769	463,835
Multi-family	12,881,115	30%	3,864,335	77,287
			TOTAL	541,122

NORTH SHORE GAS

INDIVIDUALLY METERED	SPACE HEATING USE (THERMS)	% NOT PERFORMING REGULAR MAINTENANCE	APPLICABLE THERMS	THERM SAVINGS
Single-family	19,217,344	30%	5,765,203	115,304
Multi-family	480,097	30%	144,029	2,881
			TOTAL	118,185

“How often do you usually replace your furnace filter?”

	% RESPONDENTS
More often than monthly	1.4%
About monthly	23.4%
Every couple of months	32.6%
A few times a year	23.4%
Annually	13.6%
Less than annually	0.9%
By some other schedule	2.6%
Never	2.1%
(‘don’t know’ and ‘refused’ excluded)	-

~ 5%

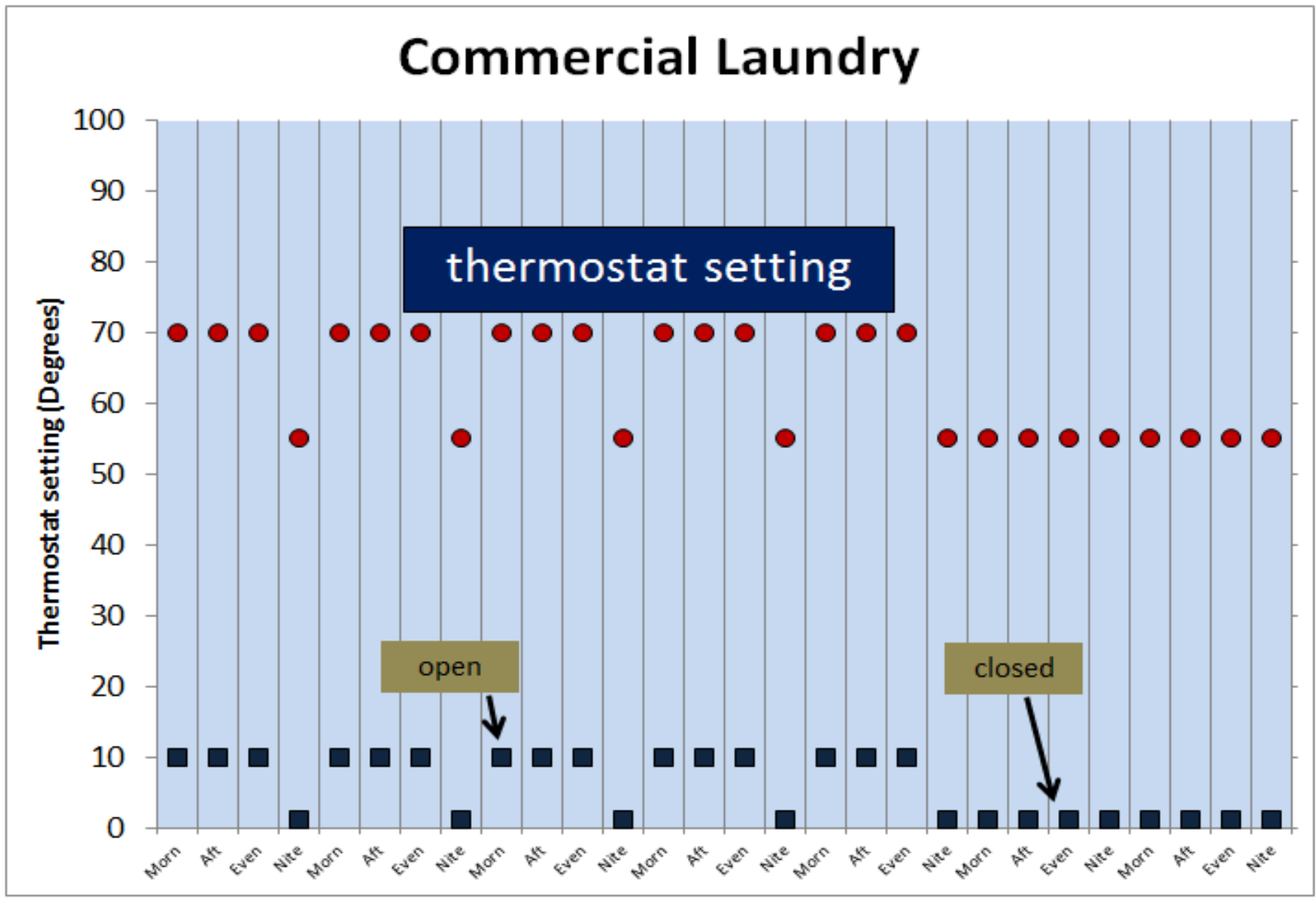
Savings from replacing furnace filters

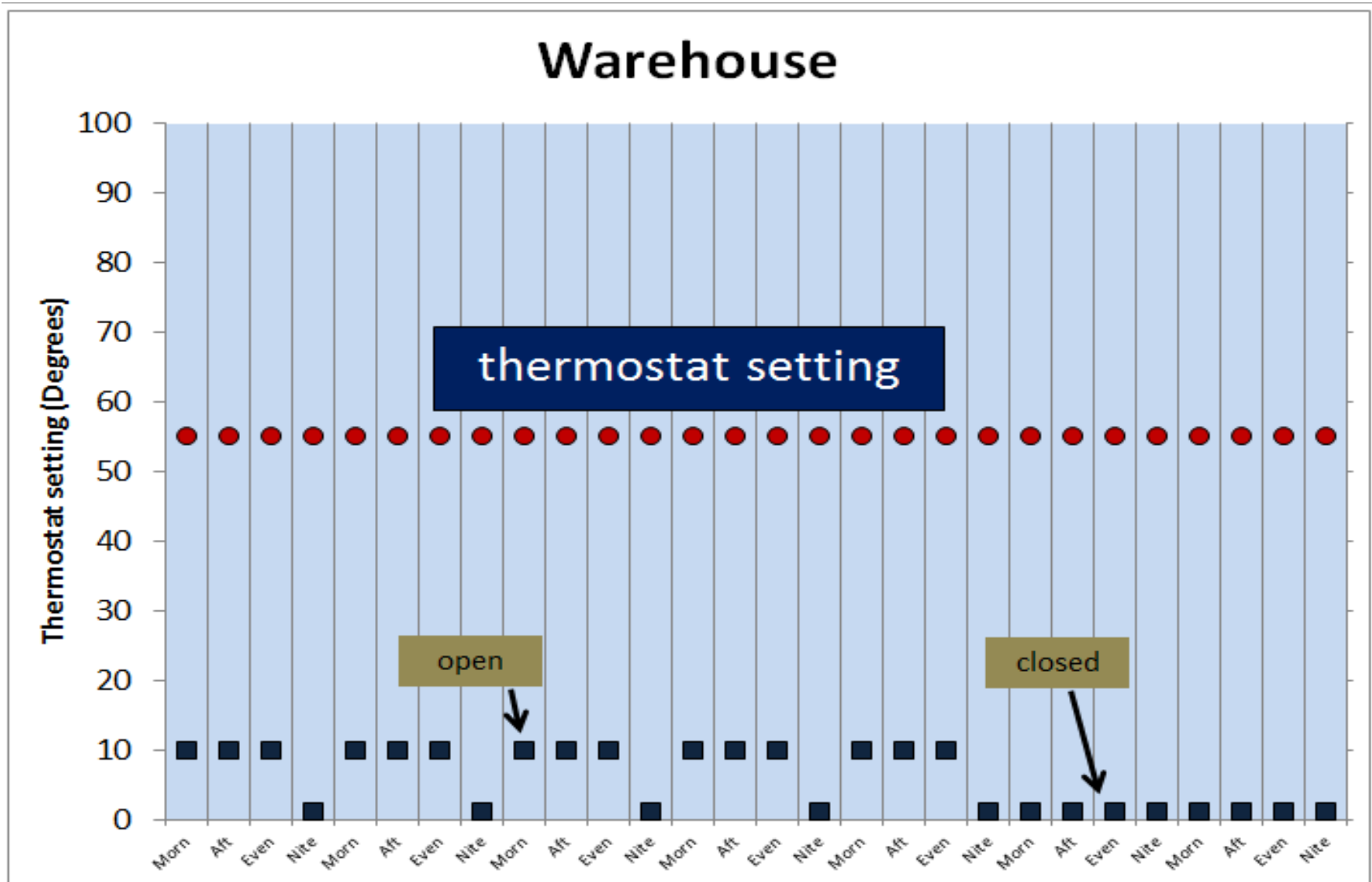
PEOPLES GAS

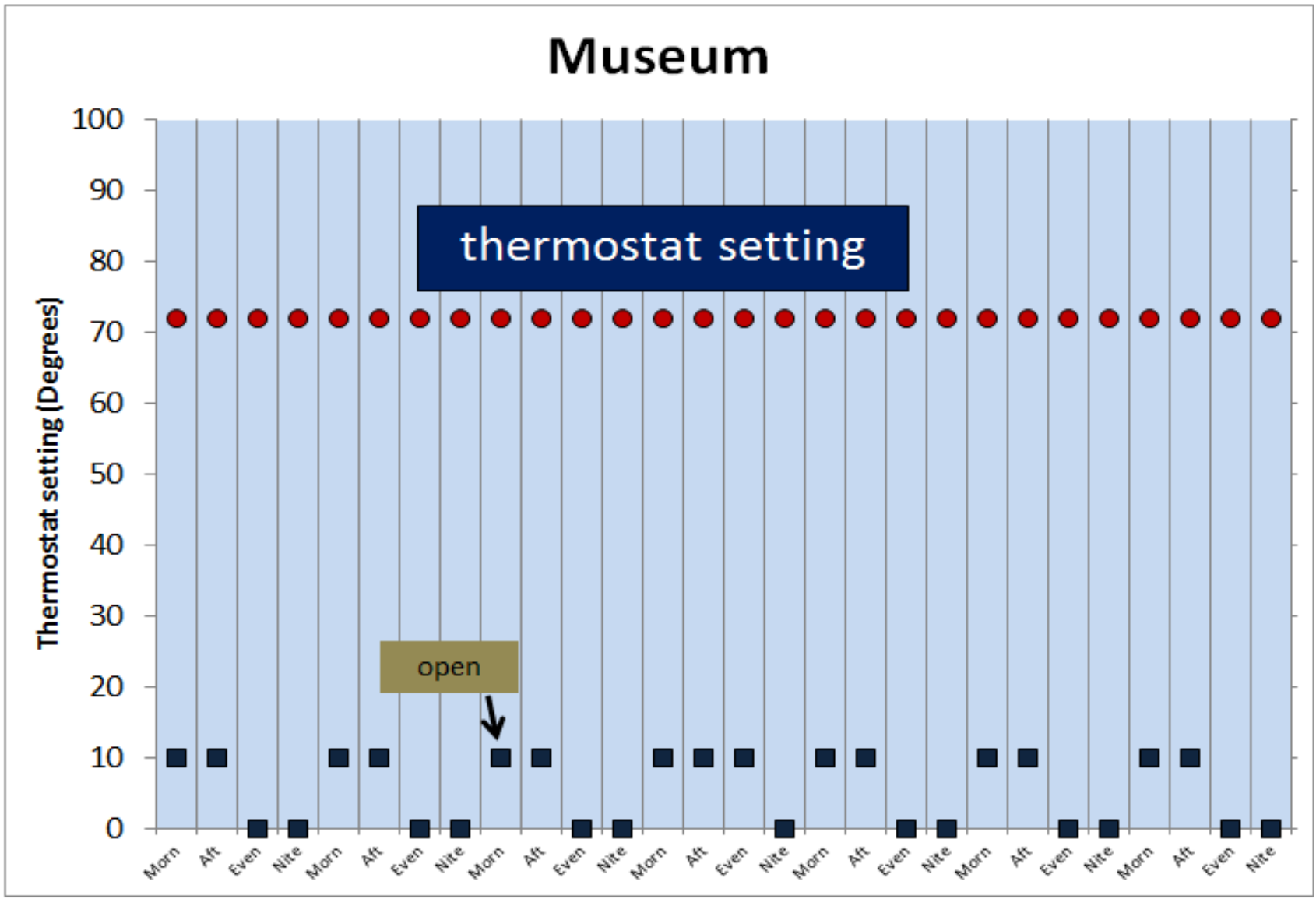
INDIVIDUALLY METERED	SPACE HEATING USE (THERMS)	% NOT REPLACING FILTERS REGULARLY	THERM SAVINGS
Single-family	182,538,502	5%	177,793
Multi-family	92,223,537	5%	89,826
TOTAL			267,618

NORTH SHORE GAS



INDIVIDUALLY METERED	SPACE HEATING USE (THERMS)	% NOT REPLACING FILTERS REGULARLY	THERM SAVINGS
Single-family	101,417,742	5%	93,304
Multi-family	4,213,932	5%	4,104
TOTAL			97,409







In the potential study, we asked “**does your facility regularly perform boiler tune-ups?**”

	FIRMS TUNING UP
	47%
	70%

PEOPLES GAS

SEGMENT	SPACE HEATING USE (THERMS)	AVAILABLE THERMS	THERM SAVINGS FROM TUNING UP
Small office	3,453,619	1,830,418	29,287
Large office	30,541,174	16,186,822	258,989
Food service	1,489,283	789,320	12,629
Private education	6,526,819	3,459,214	55,347
Religious	7,958,109	4,217,798	67,485
Other health care	1,006,736	533,570	8,537
Service	2,863,589	1,517,702	24,283
Lodging	20,995,568	11,127,651	178,042
TOTAL			634,600

NORTH SHORE GAS

SEGMENT	SPACE HEATING USE (THERMS)	AVAILABLE THERMS	THERM SAVINGS FROM TUNING UP
Small office	1,028,125	308,437	4,935
Large office	2,725,058	817,517	13,080
Food service	299,585	89,876	1,438
Retail	981,686	294,506	4,712
Private education	1,472,942	441,883	7,070
Religious	2,341,391	702,417	11,239
Service	1,117,622	335,286	5,365
Lodging	2,094,689	628,407	10,055
TOTAL			67,375