



Department of Commerce Illinois Public Sector and Low Income Potential Study

Preliminary results for the 2017-2020 planning cycle

ERC Team



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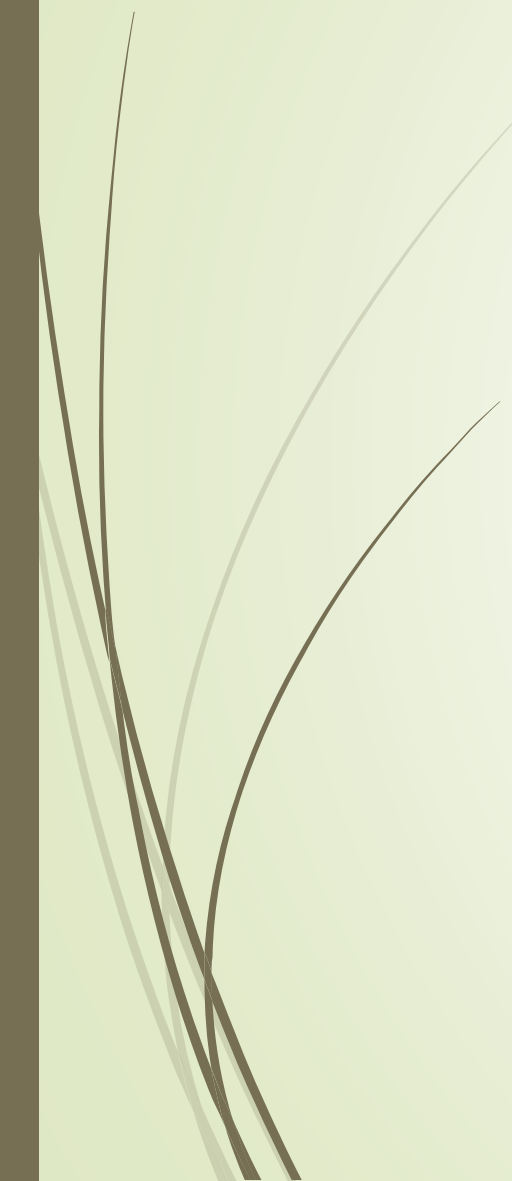
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Agenda

- ▶ Objectives
 - ▶ Introduction
 - ▶ Approach
 - ▶ Baseline update – Public Sector & Low Income
 - ▶ Department's tracking data – Public Sector & Low Income
 - ▶ Market Conditions
 - ▶ Energy Efficiency Measures
 - ▶ EE Potential
 - ▶ Example of one sub-sector in detail
 - ▶ Public Sector summary data (including CHP)
 - ▶ Low Income summary data
 - ▶ Coming Soon
 - ▶ Conclusions
- 



Objectives



- ▶ Inform planning for the cycle 2017-2020 to be submitted by the Department to the ICC on September 1st, 2016
- ▶ Inform the Department on opportunities for the Public Sector and Low Income sector

Introduction



Unique features and challenges:

- ▶ Statewide approach
- ▶ 6 separate utility territories (2 Elec, 4 gas)
- ▶ Up to 6 different sources of data from utilities
 - ▶ Haven't received data from all utilities, so several assumptions had to be made
- ▶ Unique and diversified sub-sectors (e.g. Wastewater plant vs 24hr Police station vs local library)
- ▶ NO Home Energy reports

A large taxidermy elephant head is positioned in the center of a conference room, facing the camera. The elephant's trunk is visible, and its large ears are spread out. The room is set up for a meeting, with a long dark wood conference table in the foreground. Several orange folders and blue folders are placed on the table. Orange chairs are arranged around the table. In the background, there are windows, a television screen, and other office furniture. The text "Please IGNORE ME!" is overlaid in white, bold, sans-serif font across the elephant's face.

Please
IGNORE ME!

Results Summary

	Public Sector Electric	Public Sector Natural Gas	Low Income Electric	Low Income Natural Gas
Technical Potential	32%	46%	26%	30%
Economic Potential	24%	33%	30%	25%
MAX Achievable (First Year)	3.64%	3.37%	3.06%	2.20%
Program Achievable (First Year)	0.97%	0.77%	0.25%	0.26%



Approach

Description of the study approach, levels of potential and data sources



Approach



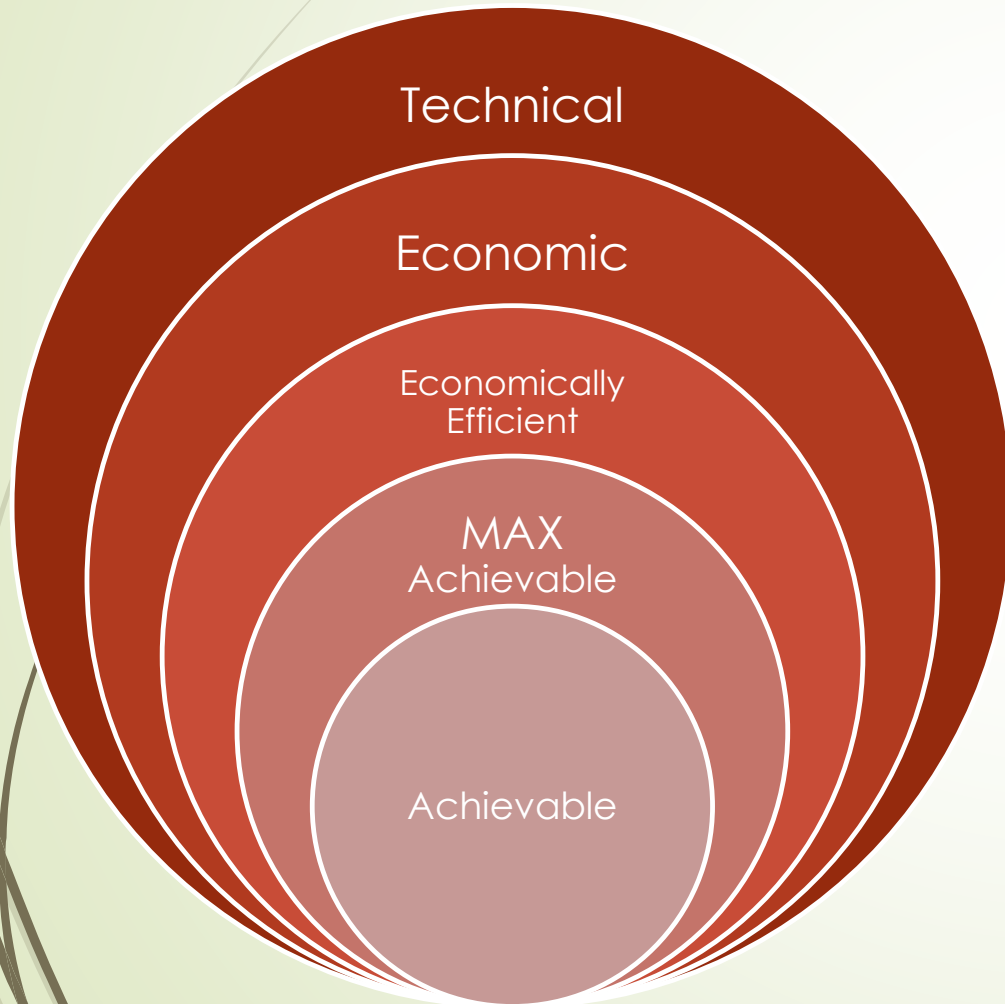
1) Baseline from previous potential study (~1,000 data points – 80% Public Sector site visits / questionnaires and 20% Low Income census data)

2) Baseline update (program participants data from over 3,500 projects and non-program participants ~200 surveys + HUD data + secondary data)

3) Potential Study evaluation

- ▶ Bottom-up approach (with top-down “reality check” whenever possible)
- ▶ Technical
- ▶ Economic
- ▶ Economically Efficient
- ▶ MAX Achievable
- ▶ Achievable

Levels of Potential



Definitions:

- Technical: instant replacement of ALL measures to the BEST technology
- Economic: instant replacement of ALL measures that are cost-effective
- Economically Efficient: instant replacement of ALL measures to the MAX cost-effective tier
- Max Achievable: given real world constraints and unlimited budgets
- Achievable: given real world constraints and program budgets

Data Sources

	Primary	Secondary
Baseline	<ul style="list-style-type: none"> • 2013 baseline study • 2016 update 	
Low Income	<ul style="list-style-type: none"> • HUD data 	<ul style="list-style-type: none"> • EIA Residential Energy Consumption Survey • American Community Survey • ICC annual gas & electric reports
Measure data	<ul style="list-style-type: none"> • TRM v4.0 – including all baseline shifts • Custom ERC calculations 	
Emerging Technologies		E3T database (WSU)
Behavioral		See slide “Additional Resources – Behavior Change”
CHP		DOE CHP Technical Potential in the US
Market Conditions	<ul style="list-style-type: none"> • Trade Ally Interviews 	
Other Studies		See slide “Additional Resources – Other Potential Studies”



Additional Resources – Behavior Change

- *Achieving Energy Efficiency through Behaviour Change: what does it take?* – European Energy Agency, Technical Report, 2013
- *Guidelines to Behavioural Change Programmes*, Intelligent Energy Europe, Behave project, 2009
- *Behavioral Assumptions in Energy Efficiency Potential Studies* – California Institute for Energy and Environment, 2009
- *Behavioral Assumptions underlying California Residential Sector Energy Efficiency Programs* – California Institute for Energy and Environment, 2009



Additional Resources - Other Potential Studies

- ▶ *Seventh Northwest Conservation and Electric Power Plan*, NWCouncil, 2016
- ▶ *PPL Electric Energy Efficiency Potential Assessment*, Cadmus Group, 2015
- ▶ *Energy Efficiency Potential and Goals Study for 2015 and Beyond*, Navigant, Final Report for the CPUC, 2015
- ▶ *US Energy Efficiency Potential Through 2035*, EPRI, Technical Report, 2014
- ▶ *Study of Potential for Energy Savings in Delaware*, Optimal Energy, 2014
- ▶ *2013 Vermont Energy Efficiency Potential Study Update*, GDS Associates, 2013
- ▶ *Meta-Review of Efficiency Potential Studies and their Implications for the South*, Georgia Tech, 2009



Baseline Energy Consumption

Analysis of Energy End-Use consumption



Baseline Assumptions – Public Sector

- ▶ Baseline energy consumption for each sub-sector is based on current data provided by utilities, previous utility data, and projections when data is unavailable.
- ▶ ComEd provided current data for most sectors.
- ▶ Peoples/North Shore provided previous data for many sectors and updates for some.
- ▶ Ameren provided previous data for selected sectors (schools, municipal, police/fire).
- ▶ Nicor sector breakout and missing sectors for other utilities based on the proportion of commercial sales attributed to each sector by reporting utilities. [Example: 0.5% of ComEd non-residential sales were attributed to Parks, therefore the same percentage was assumed for utilities not reporting data.]
- ▶ Universities and Correctional facilities reported current data.
- ▶ Airports estimated based on proportion of flight operations from FAA (excluding O'Hare and Midway).

Baseline Energy Consumption – Public Sector

Electricity			
	Total Electricity Sales	Public Sector	Percent Public Sector
	[kWh]	[kWh]	[%]
North	88,580,643,000	10,190,482,651	11.50%
South	36,897,391,000	3,621,615,646	9.79%
Total	125,478,034,000	13,812,098,296	11.03%

See Slide “Baseline Assumptions” for a complete list of assumptions used to estimate the Public Sector consumption

Baseline Energy Consumption – Public Sector

Natural Gas			
	Total Natural Gas Sales	Public Sector	Percent Public Sector
	[therms]	[therms]	
North	7,617,254,478	386,463,432	5.1%
South	1,837,565,751	169,401,256	9.2%
Total	9,454,820,229	555,864,688	5.9%

See Slide “Baseline Assumptions” for a complete list of assumptions used to estimate the Public Sector consumption

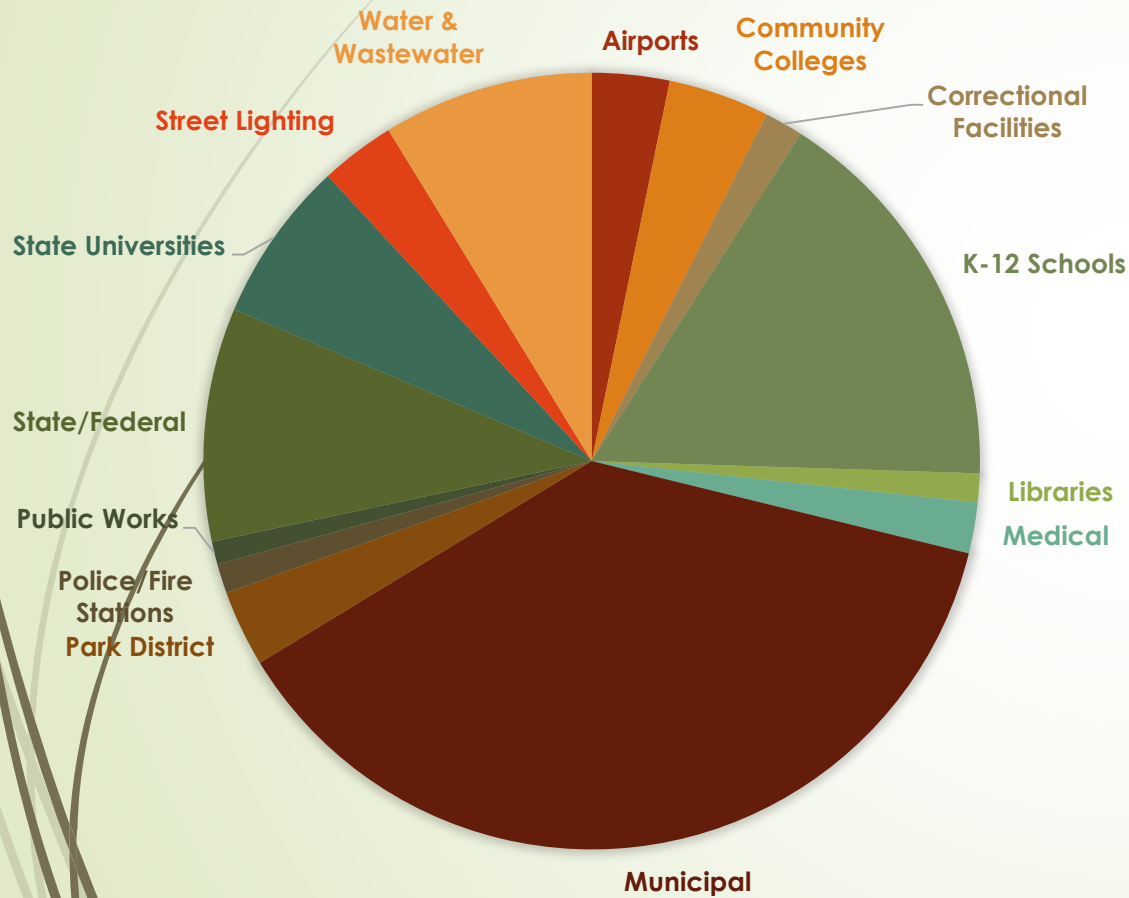
Baseline Energy Consumption

Base Energy Consumption				
Sector	Electricity [kWh]		Natural Gas [therms]	
	North	South	North	South
Airports	395,927,128	32,883,490	11,956,771	993,062
Community Colleges	246,524,563	156,075,970	14,133,994	4,798,582
Correctional Facilities	67,763,566	144,765,968	6,784,260	13,470,754
K-12 Schools	1,676,488,078	509,358,055	94,743,557	27,821,447
Libraries	113,261,456	46,271,919	5,824,025	2,204,626
Medical	199,463,652	81,489,029	14,289,498	3,882,545
Municipal	4,115,743,657	861,358,754	54,837,926	15,139,619
Park District	299,700,714	122,439,952	21,270,362	5,833,652
Police/Fire Stations	115,281,149	47,779,322	4,674,545	1,290,545
Public Works	90,172,087	36,838,971	5,149,454	1,755,193
State/Federal	916,583,416	374,461,670	64,623,545	17,841,226
State Universities	333,503,200	560,089,800	45,491,789	58,281,877
Street Lighting	793,551,096	310,136,103	0	0
Water & Wastewater	826,518,889	337,666,642	42,683,706	16,088,127
TOTAL	10,190,482,651	3,621,615,646	386,463,432	169,401,256

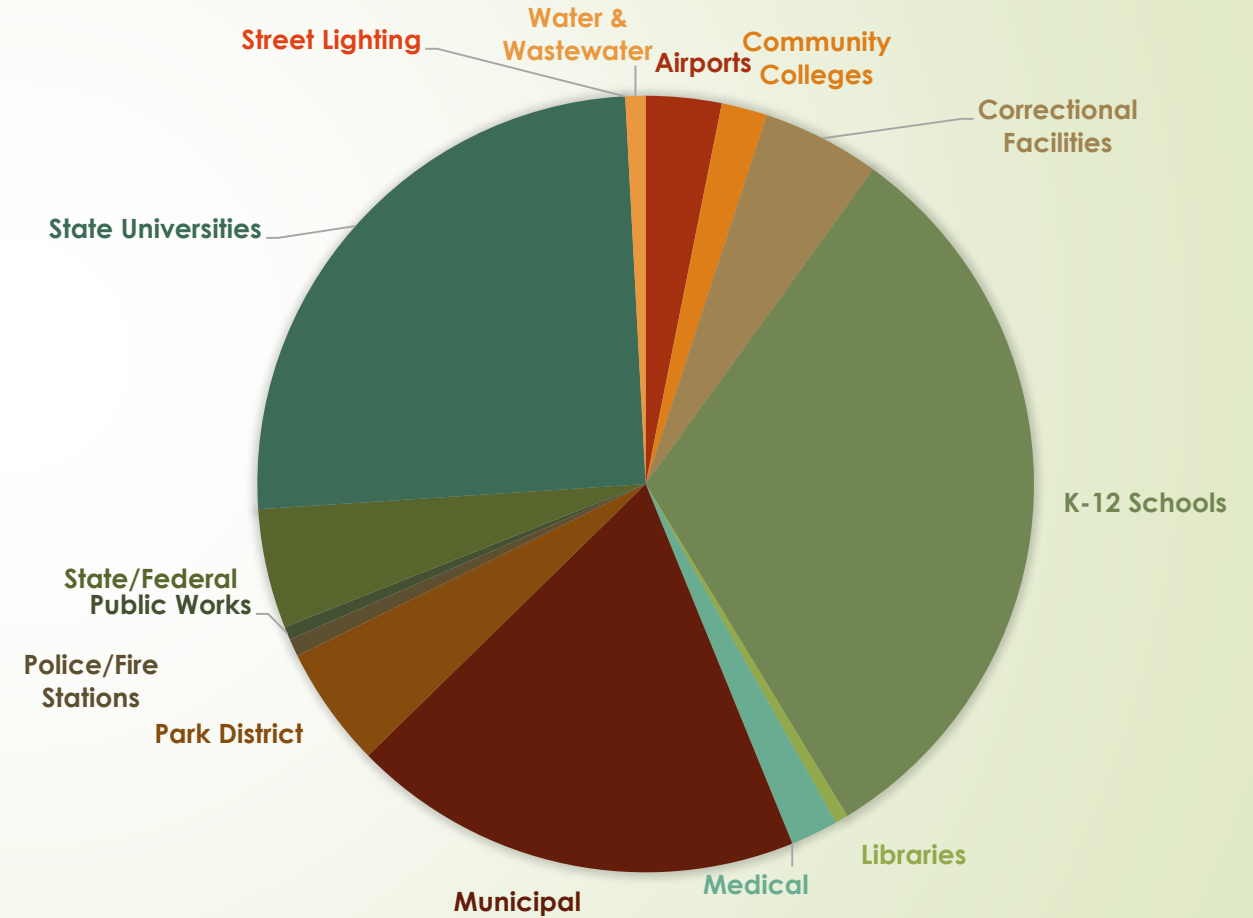
See Slide "Baseline Assumptions" for a complete list of assumptions used to estimate the Public Sector consumption

Baseline – Public Sector

BASELINE ENERGY CONSUMPTION - ELECTRIC



BASELINE ENERGY CONSUMPTION - NATURAL GAS





Baseline Assumptions – Low Income

- ▶ Percent and number of low income utility customers by single and multi-family from American Community Survey 2013, Illinois 1% sample (49,673 households).
- ▶ Number of LI customers adjusted by total residential customers reported by ICC, Comparison of Electric Sales Statistics and Comparison of Gas Sales Statistics, 2014.
- ▶ Average utility bills from ICC, relative bills by housing type from ACS.
- ▶ Number of multi-family customers reporting utility bills in rent from ACS used to estimate number of master-metered customers.

Baseline Energy Consumption – Low Income

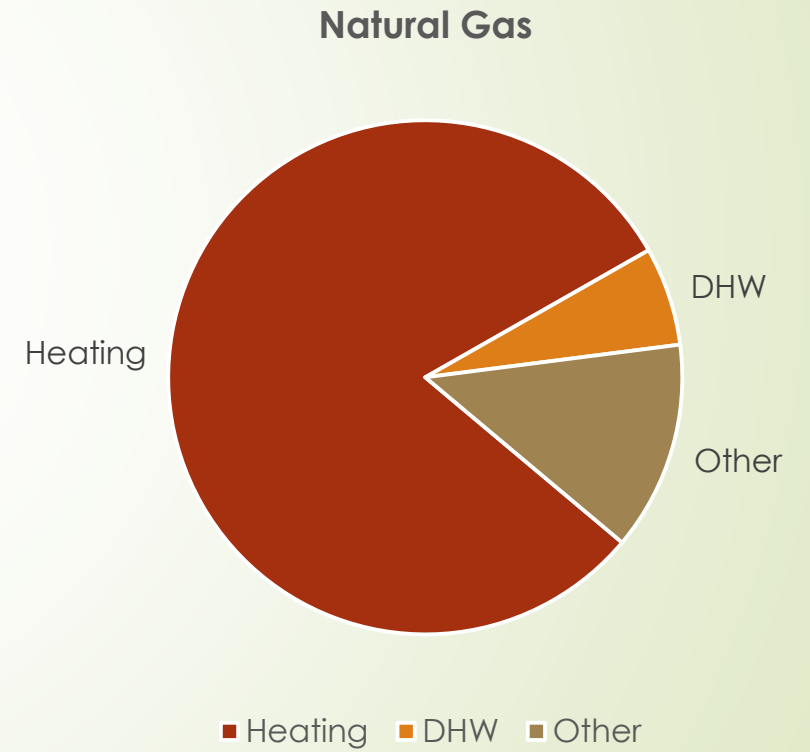
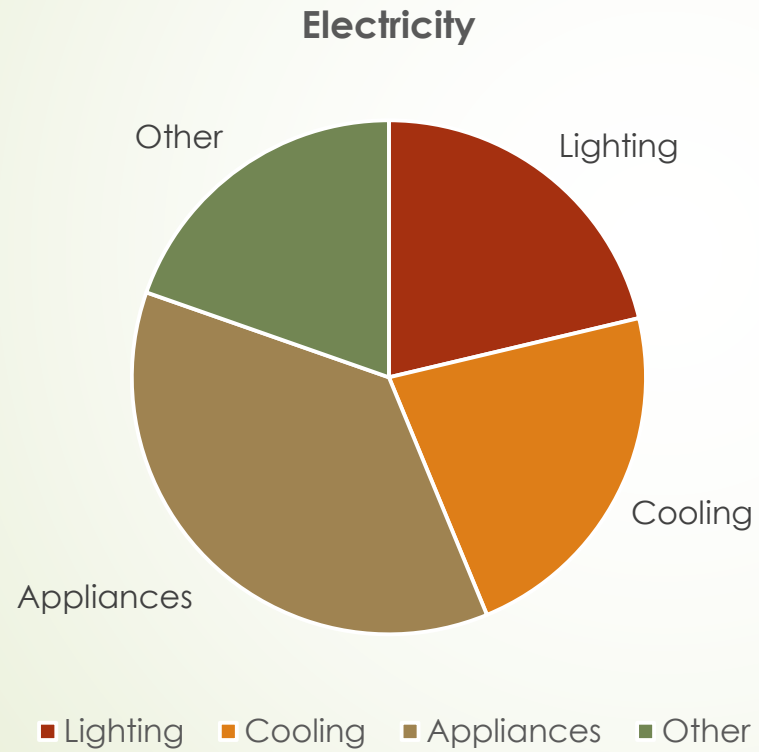
Electricity			
	Total Electricity Sales	Low Income	Percent LI Sector
	[kWh]	[kWh]	[%]
North	88,580,643,000	5,510,139,648	6.2%
South	36,897,391,000	2,704,211,883	7.3%
Total	125,478,034,000	8,214,351,531	6.5%

Natural Gas			
	Total Natural Gas Sales	Low Income	Percent LI Sector
	[therms]	[therms]	[%]
North	7,617,254,478	726,149,170	9.5%
South	1,837,565,751	163,743,380	8.9%
Total	9,454,820,229	889,892,551	9.4%

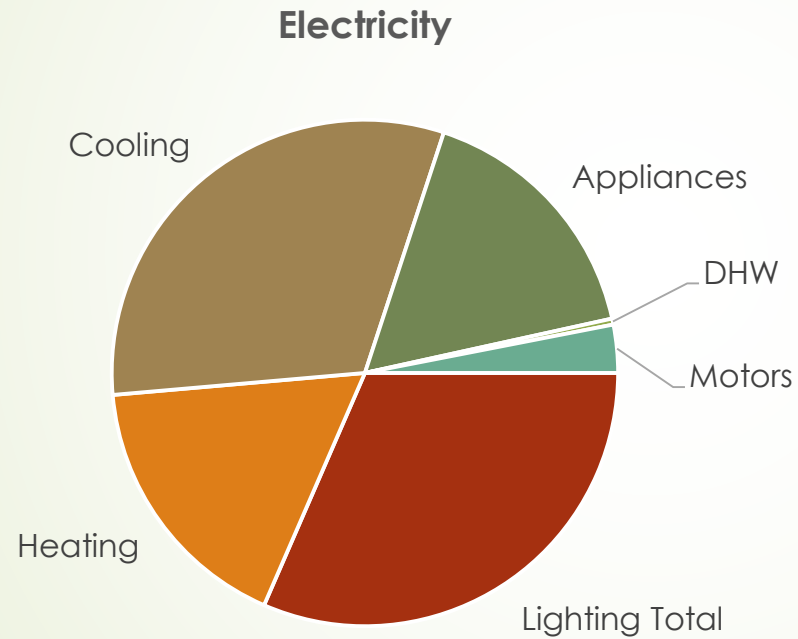
Baseline Energy Consumption – Low Income North vs South Illinois

Sector	Electricity		Natural Gas	
	North [kWh]	South [kWh]	North [therms]	South [therms]
Single Family	2,837,018,147	2,033,202,309	406,193,988	134,017,813
Multi Family	2,673,121,501	671,009,575	319,955,182	29,725,567
TOTAL	5,510,139,648	2,704,211,883	726,149,170	163,743,380

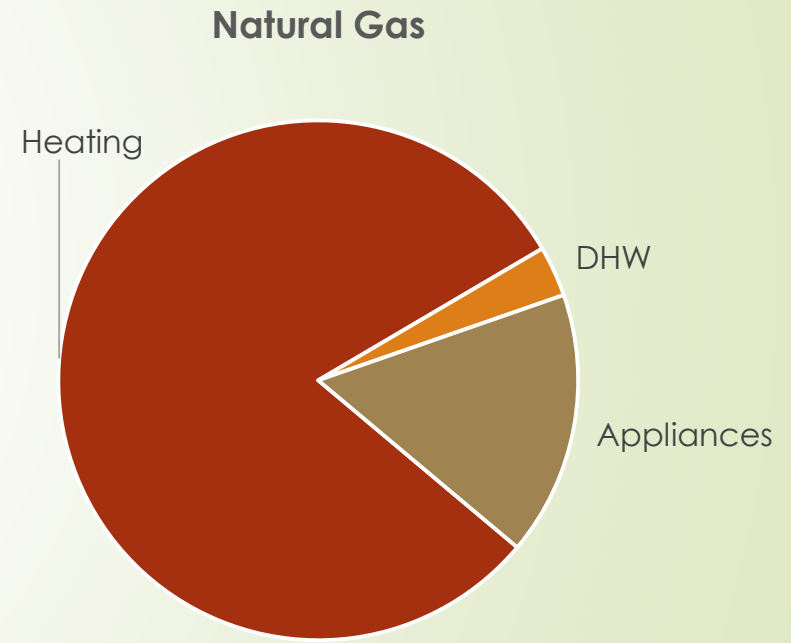
End-Use Low Income Single Family



End-Use Low Income Multi-Family



■ Lighting Total ■ Heating ■ Cooling ■ Appliances ■ DHW ■ Motors



■ Heating ■ DHW ■ Appliances



Public Sector EEPS Program Participation

Analysis of public sector participant's tracking data for the period
PY5-PY7

Example: K-12 Schools PY5-7

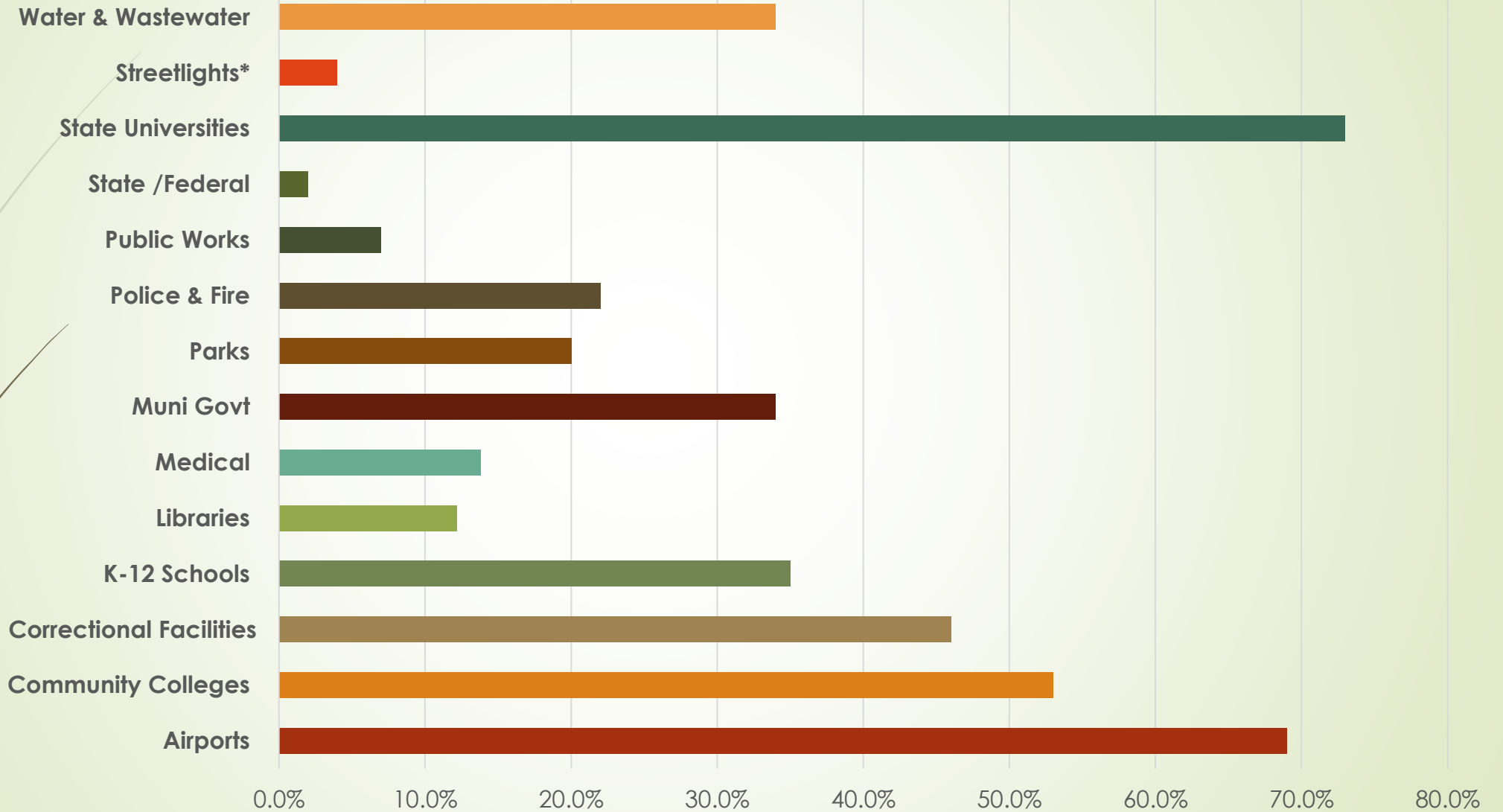
K-12 Schools PY5-7 Participation rates		
	No. of Districts	No. of Schools
Participating	365	1622
Total	875	4650
Participation Rate	41.7%	34.9%

Note: In addition to school facilities, approximately 150 district offices and administration buildings & 15 bus facilities participated

Public Sector EEPS Participation PY5-7

Sector	Participants (PY5-7)	Non-participants (PY5-7)
Airports	69.0%	31.0%
Community Colleges	53.0%	47.0%
Correctional Facilities	46.0%	54.0%
K-12 Schools	35.0%	65.0%
Libraries	12.2%	87.8%
Medical	13.8%	86.2%
Municipal	34.0%	66.0%
Parks	20.0%	80.0%
Police & Fire	22.0%	78.0%
Public Works	7.0%	93.0%
State /Federal	2.0%	98.0%
State Universities	73.0%	27.0%
Streetlights	4.0%	96.0%
Water & Wastewater	34.0%	66.0%

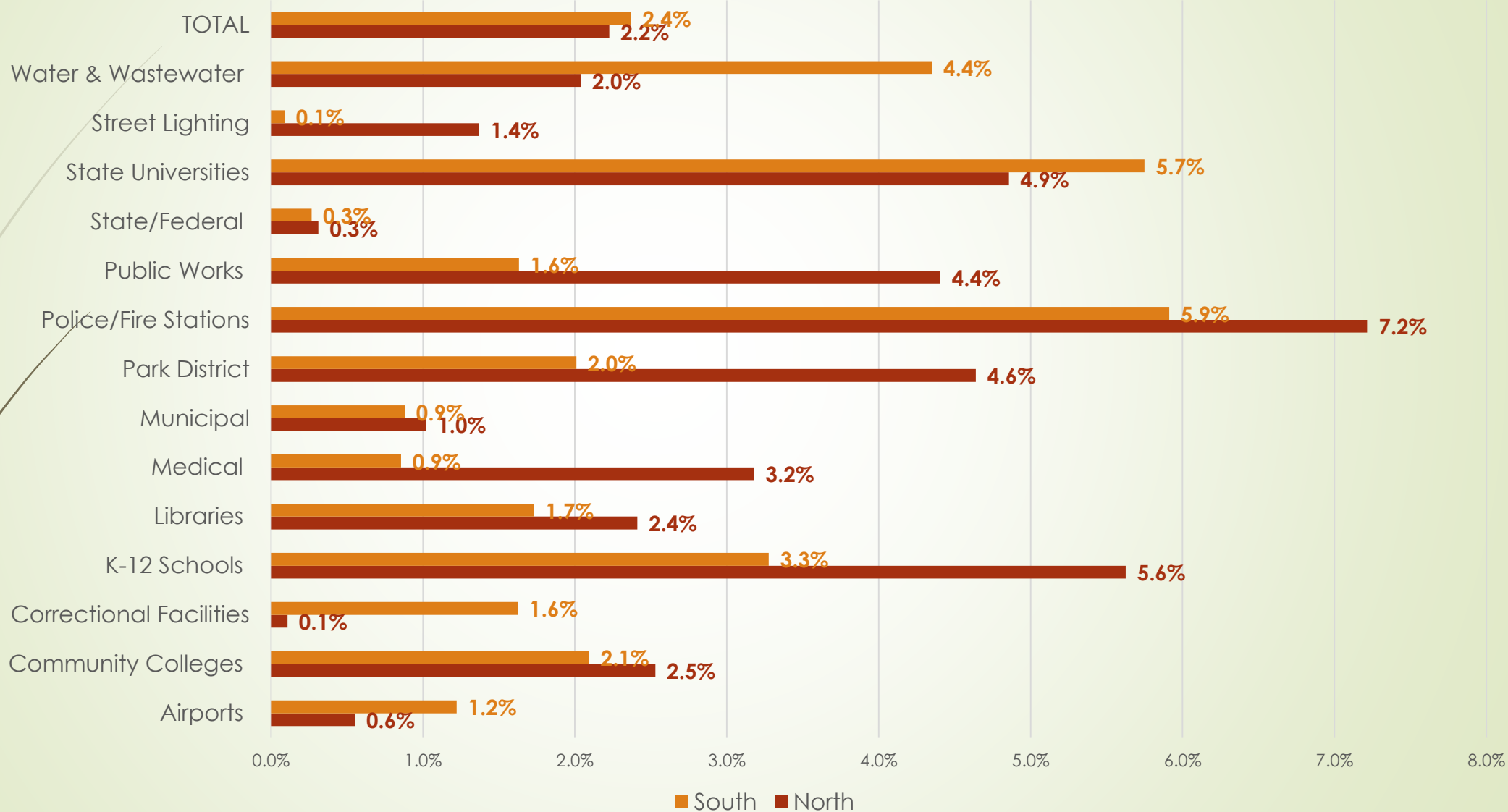
Program Participation PY5-7



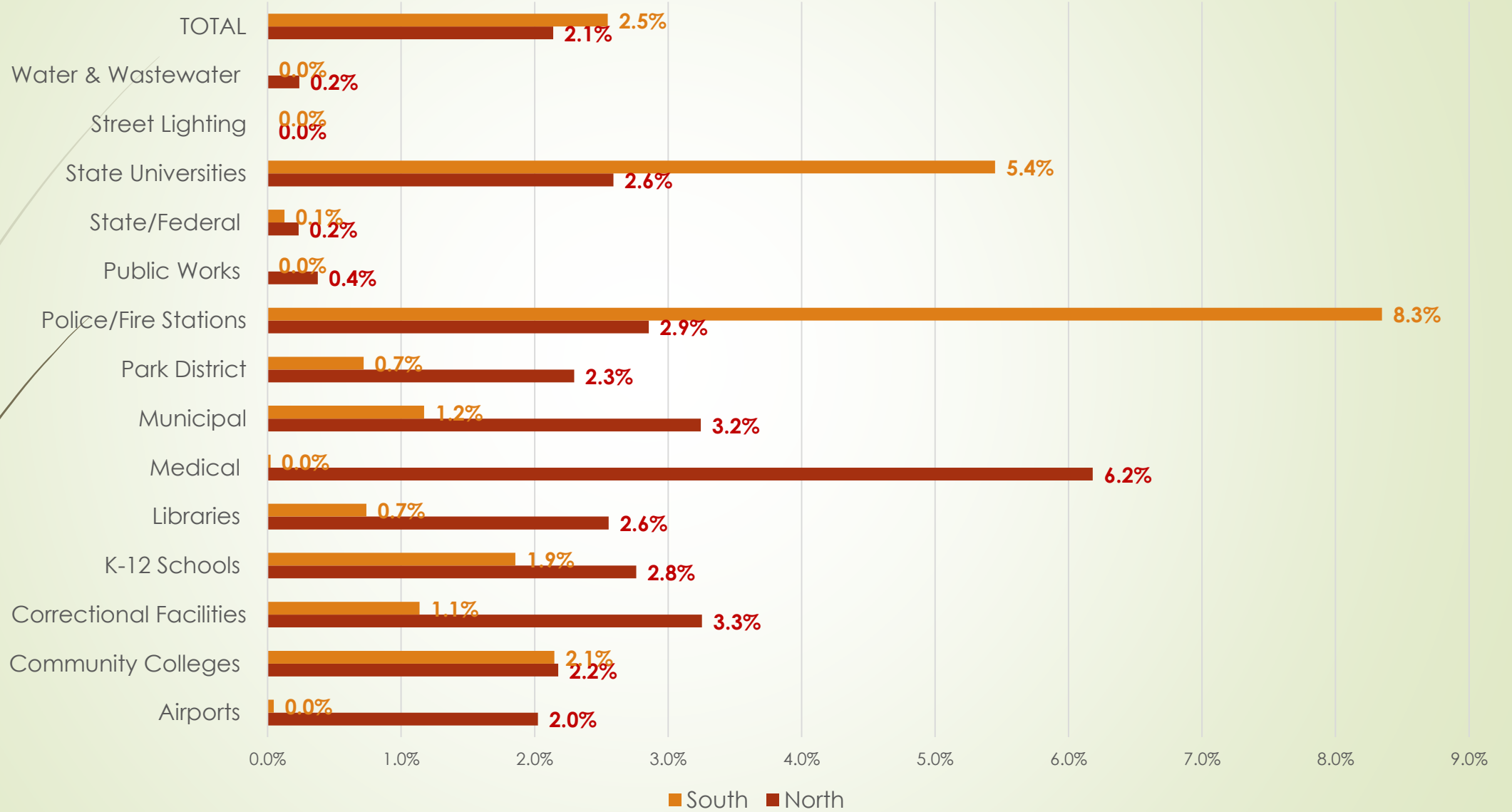
Public Sector EEPS Savings PY5-7

Energy Savings from DCEO Program Participants				
Sector	Electricity (kWh)		Natural Gas (therms)	
	North	South	North	South
Airports	2,184,647	401,614	242,046	451
Community Colleges	6,237,645	3,268,738	307,625	103,053
Correctional Facilities	73,429	2,352,320	220,720	153,381
K-12 Schools	94,304,334	16,687,733	2,616,404	516,434
Libraries	2,730,239	800,746	148,797	16,306
Medical	6,343,798	696,983	883,285	816
Municipal	42,011,480	7,578,185	1,779,517	177,467
Park District	13,905,706	2,460,682	488,447	41,974
Police/Fire Stations	8,317,983	2,824,614	133,469	107,730
Public Works	3,973,415	600,871	19,303	0
State/Federal	2,851,555	997,689	149,727	22,379
State Universities	16,198,029	32,204,452	1,178,773	3,176,025
Street Lighting	10,870,529	274,009	0	0
Water & Wastewater	16,855,926	14,689,871	100,944	285
TOTAL	226,858,715	85,838,507	8,269,057	4,316,301

Electricity Savings by Public Sector PY 5-7



Natural Gas Savings by Public Sector PY 5-7



Low Income Program Participation

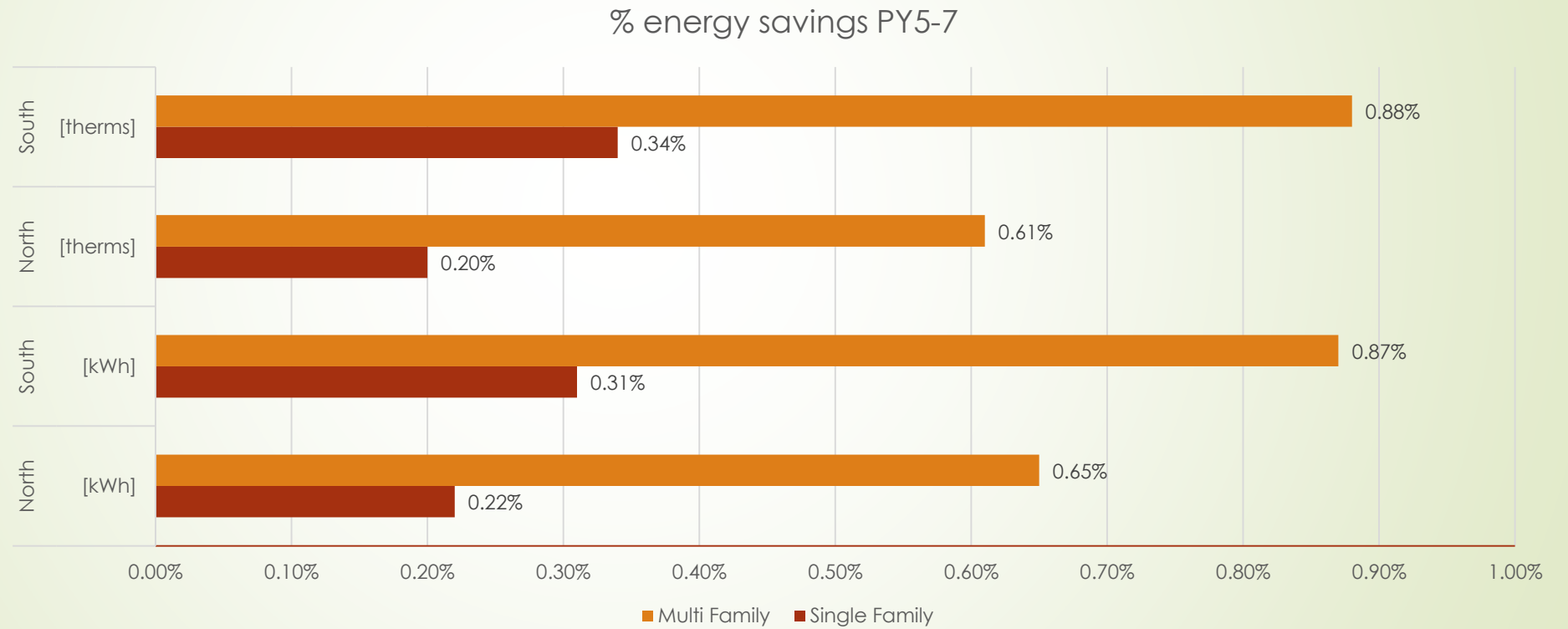
Program	Electricity		Natural Gas	
	North [kWh]	South [kWh]	North [therms]	South [therms]
Residential Retrofit – SF	6,105,488	5,264,978	793,684	418,234
Residential Retrofit – MF	5,764,118	1,271,548	1,248,053	109,079
Efficient Living - MF	7,036,024	3,452,218	524,365	142,959
EEAHCP - SF	54,030	1,026,567	7,218	32,423
EEAHCP - MF	4,708,435	1,117,993	187,554	10,808
TOTAL	23,668,095	12,133,304	2,760,874	713,502

Low Income Energy Savings PY5-7

Sector	Electricity		Natural Gas	
	North [kWh]	South [kWh]	North [therms]	South [therms]
Single Family	6,159,518	6,291,545	800,902	450,657
Multi Family	17,508,577	5,841,759	1,959,972	262,846
TOTAL	23,668,095	12,133,304	2,760,874	713,502

Sector	Electricity		Natural Gas	
	North [kWh]	South [kWh]	North [therms]	South [therms]
Single Family	0.22%	0.31%	0.20%	0.34%
Multi Family	0.65%	0.87%	0.61%	0.88%
TOTAL	0.43%	0.45%	0.38%	0.44%

Low Income Energy Savings PY5-7





Market Conditions

Trade Ally interviews

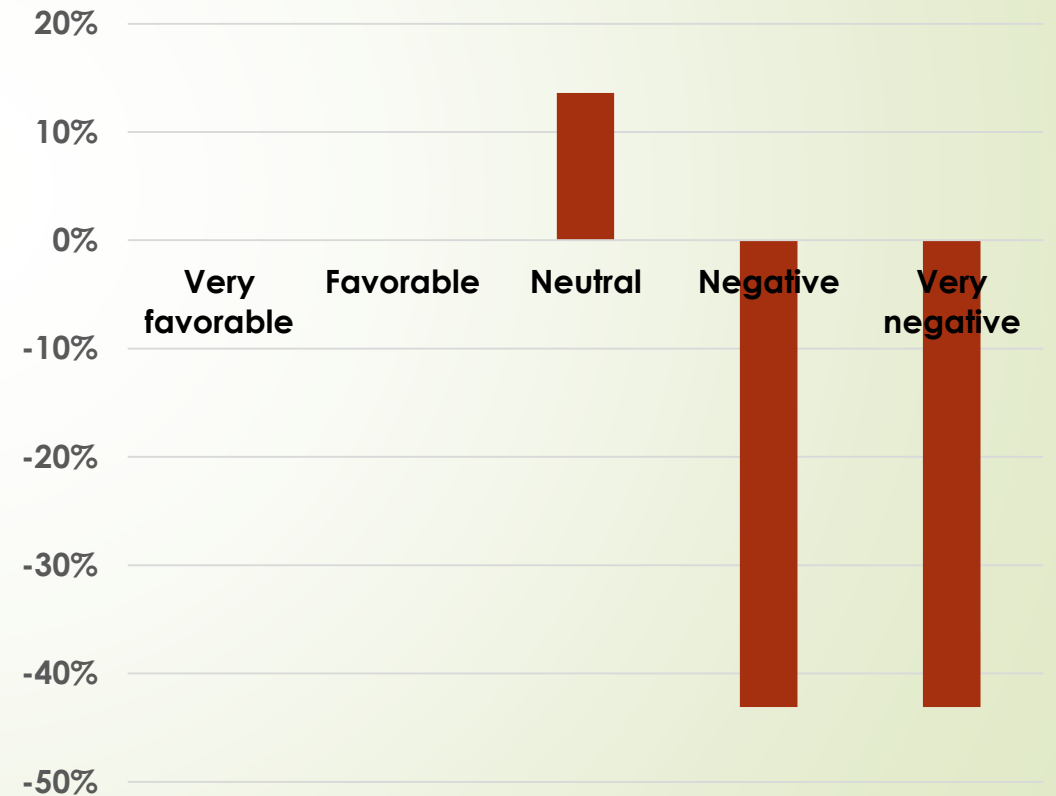
Trade Ally Interviews

What was the impact of FY16 State budget on your business?

“All public entities have moved into an "emergency repairs only" state. No new projects or energy efficiency improvements have been approved”

“30% decrease in revenue”

“We missed potential projects”



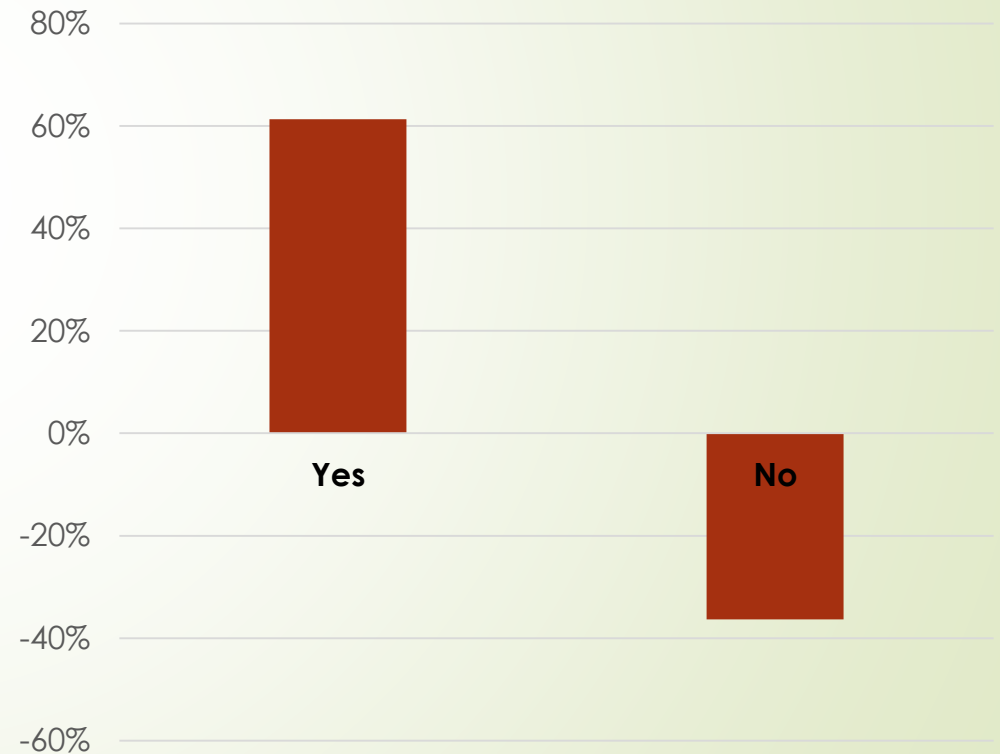
Trade Ally Interviews

Do you have energy efficient equipment on your truck ready to install?

“Our staff always has lighting samples ready to go, and our electricians have basic wiring materials and tools for every job”

“LED Lamps”

“Parallel positioning, linkage-less control systems for burners”



Trade Ally Interviews

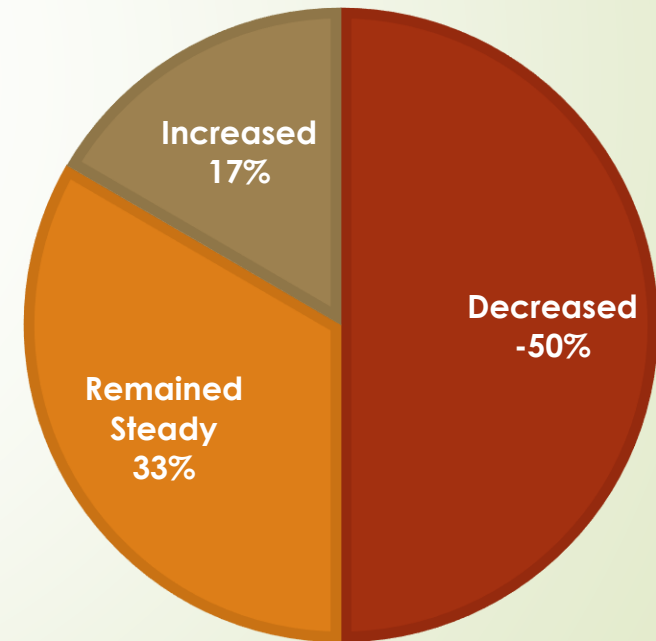
The amount of maintenance requests in the public sector has:

“No State budget means reduced funding. The first thing to cut is the maintenance budget”

“Let me put it this way, the CDB reports \$6.5B in deferred maintenance in state owned facilities and an additional \$6.5B in higher education facilities”

“Customers are letting lamps/ballasts burn out and even then delaying maintenance”

**MAINTENANCE SERVICES
REQUEST**

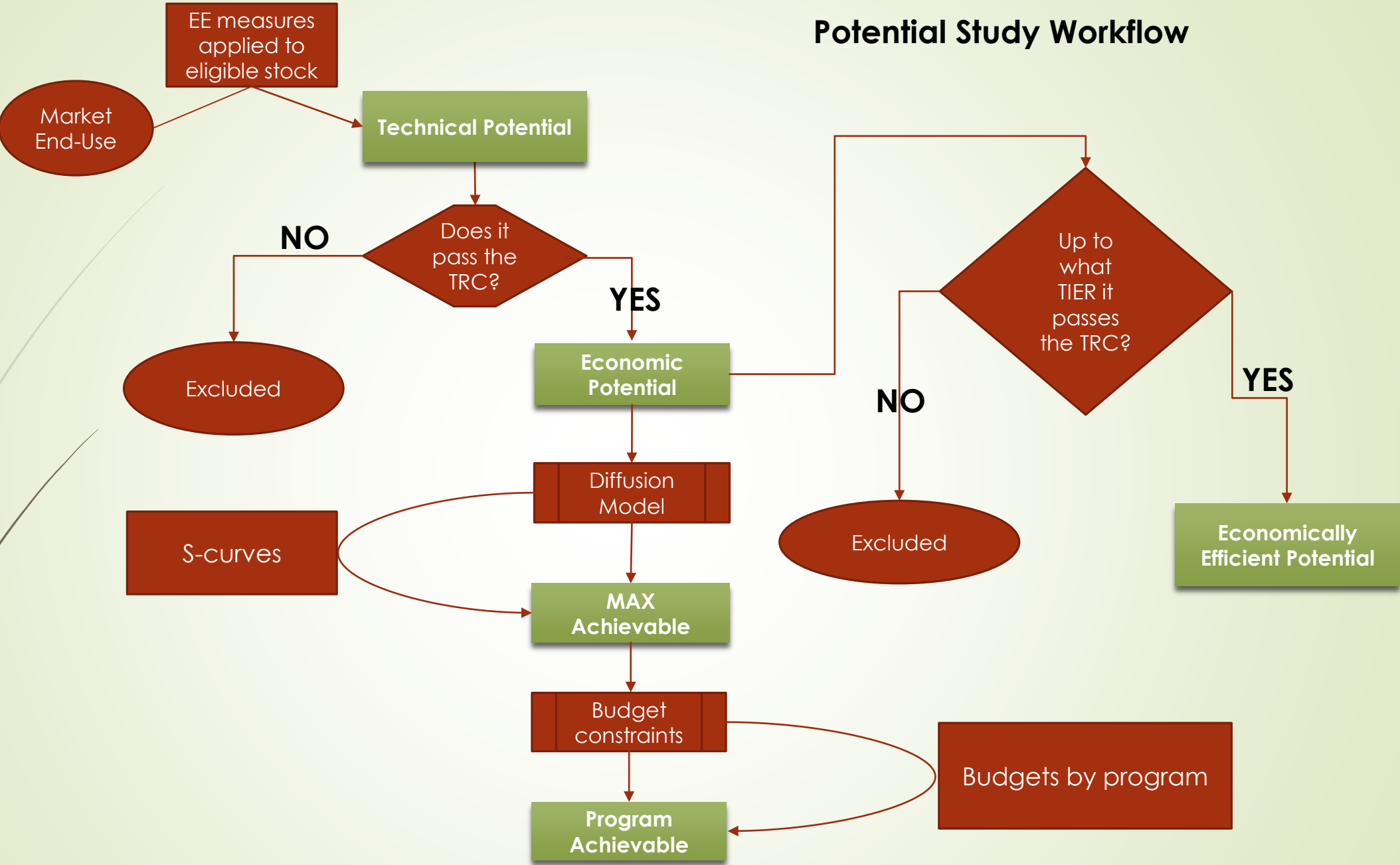




Energy Efficiency Measures

Explanation of savings potential approach

Potential Study Workflow



Measure List

Heating	Cooling	Indoor Lighting	Exit Signs	Outdoor Lighting	Appliances	Domestic Hot Water (DHW)	Behavioral	Building Envelope	Other
Furnace	Window Units	T12	Incandescent	HID	Computer	Electric	Adjusting Temperature Set-points	High Efficiency Windows	Motors
Roof-top Units	Roof-top Units	T8	CFL	Incandescent	Printer/Copiers	Natural Gas w/Tank	Implementing Temperature Setback/up	Ceiling/Wall Insulation	Pool Heaters
Boiler	Chillers	High-efficiency T8	LED	LED	Servers	Natural Gas Tank-less	Turning lights off in un-occupied areas	Air Sealing	Demand Control Ventilation
Electric Coils	Heat-pumps	LED Fluorescent Tubes			Vending Machines	Low Flow Faucet/Shower	Proper Maintenance	Reflective Roof	Programmable T-Stats
Heat-pumps	Split Systems	Incandescent			Icemaker	Laminar Flow			Smart T-stats
Other Heating Units	Other Cooling Units	CFL			Dishwasher				Power strips
Hot Pipe Insulation		Screw-in LED			Refrigerator				
Steam Traps		HID			Microwave				
		HB T8			Oven/Broiler				
		HB T5			Fryer				
		Occupancy Sensors			Hot Food Container				
		Over-lighting			Steamer				

Emerging Technologies - examples

Emerging Tech	Energy System	Typical Savings
Ducted Variable-Speed Split System Heat Pump	HVAC	39%
Advanced RTU Controls retrofit	HVAC	45%
Intelligent Outlets	Energy Management	26%
Integrated Design Strategies	Design	5%
Copper Rotor Motors	Motors	1%
Active Chilled Beam Heating and Cooling	HVAC	20%
High Performance Elevators	Elevators and Escalators	80%
High Performance Escalators	Elevators and Escalators	35%

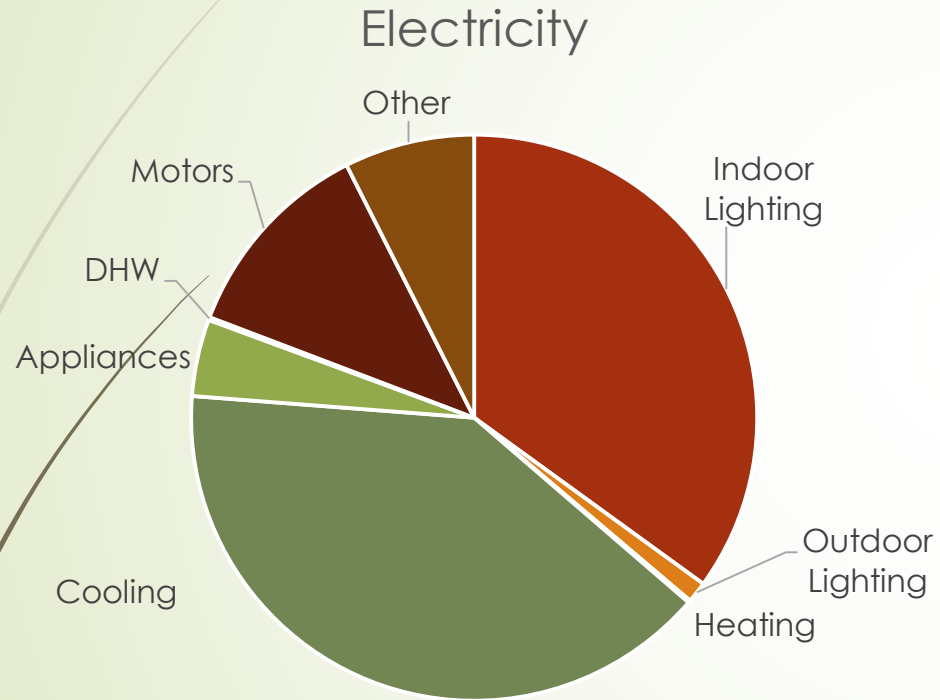
New Technologies Impact can have a wide range, from 1% to 80% technical potential reduction for a given end-use. Impacts of ETP are NOT included in EE potential estimates, and will be included in the sensitivity analysis



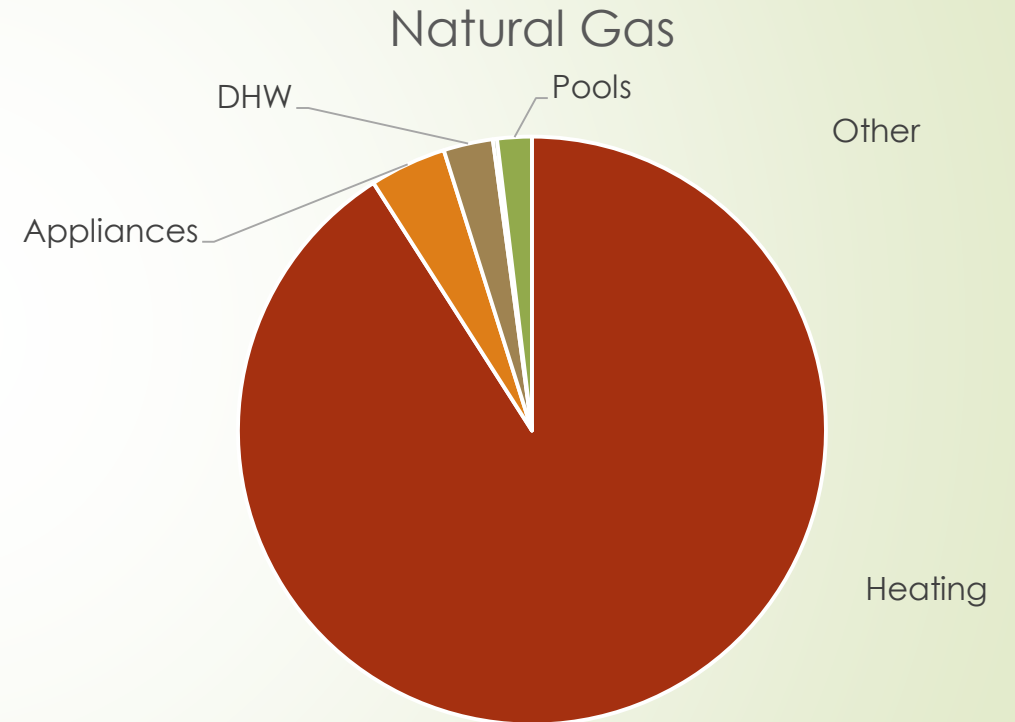
EE Potential: Example of One Subsector

Analysis of end-use consumption, technical, economic, economically efficient, MAX achievable and program achievable potential of K-12 Schools

End-Use K-12 Schools



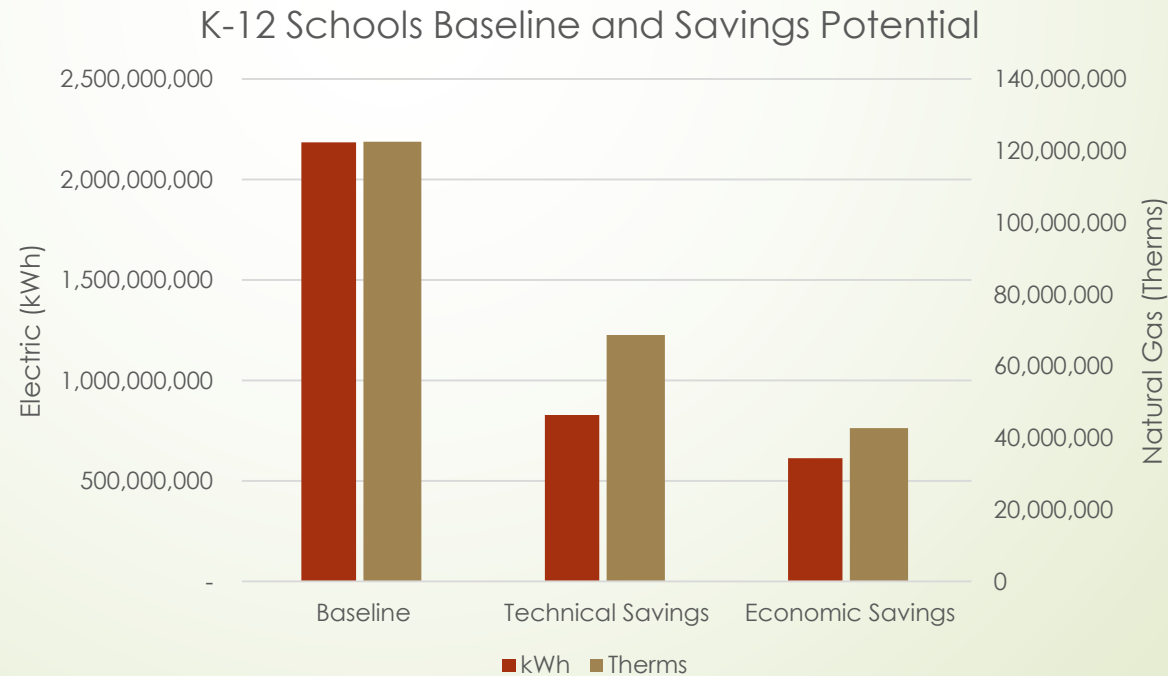
- Indoor Lighting
- Outdoor Lighting
- Heating
- Cooling
- Appliances
- DHW
- Motors
- Other



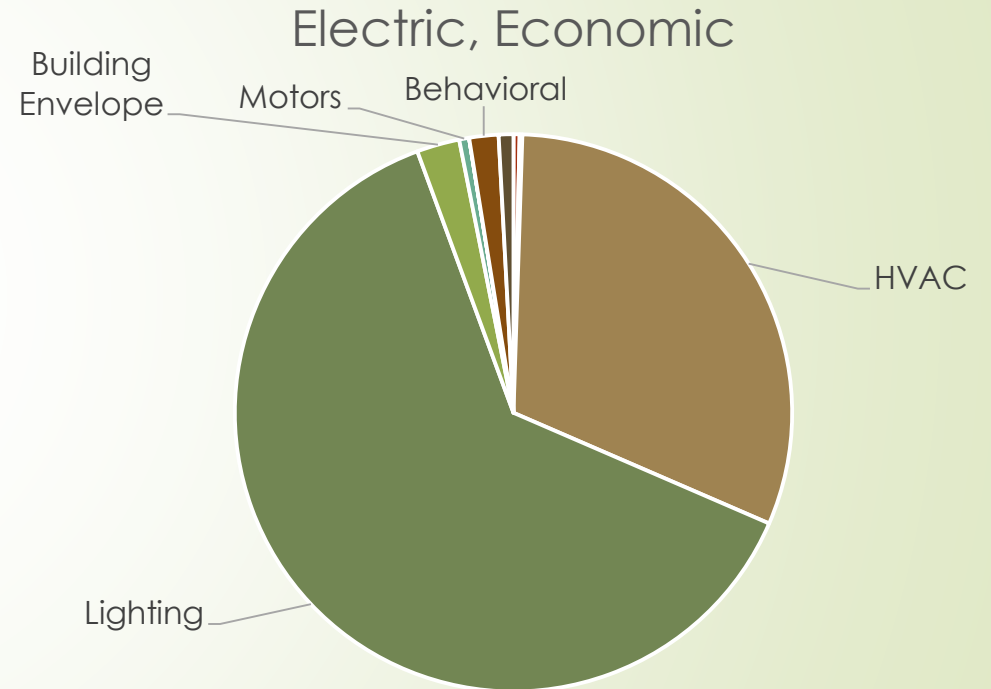
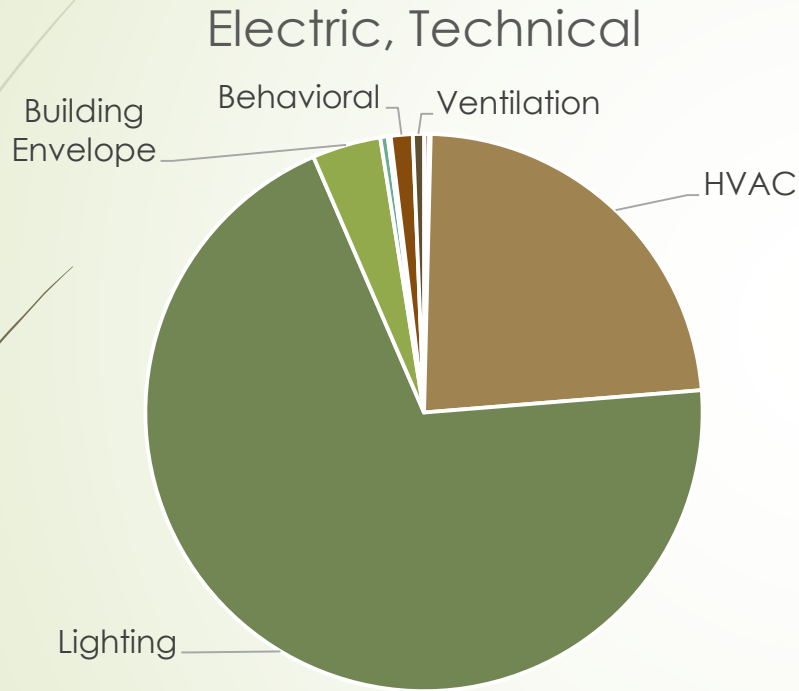
- Heating
- Appliances
- DHW
- Other
- Pools

Technical and Economic Potential K-12 Schools

	Total Consumption	Technical	Technical Potential	Economic	Economic Potential
Electric	2,185,846,133	38%	828,399,007	28%	613,723,220
Natural Gas	122,565,004	56%	68,677,479	34%	42,758,645



Electric Technical and Economic Potential K-12 Schools by End-Use

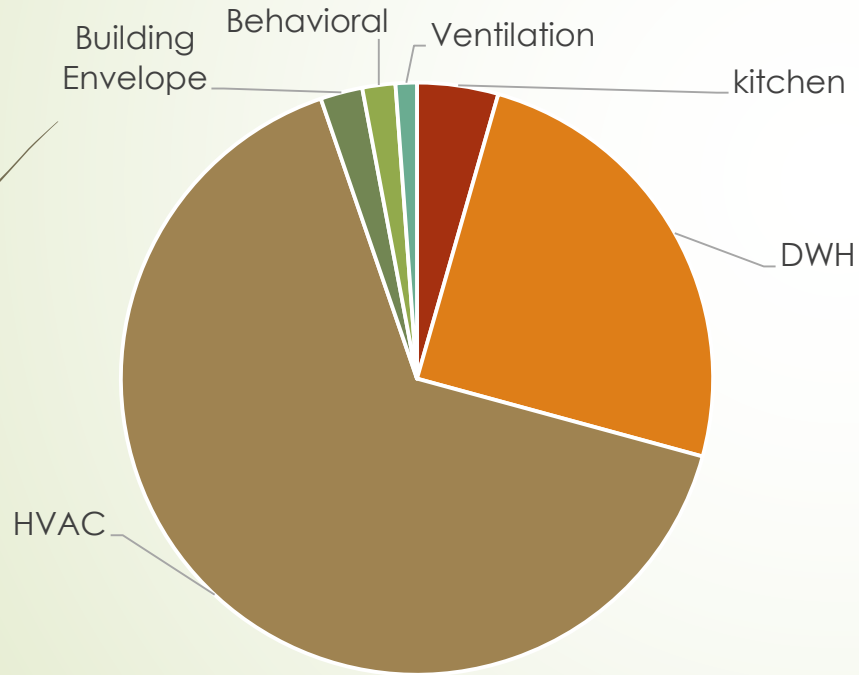


- kitchen
- DWH
- HVAC
- Lighting
- Building Envelope
- Motors
- Refrigeration
- Behavioral
- Ventilation

- kitchen
- DWH
- HVAC
- Lighting
- Building Envelope
- Motors
- Refrigeration
- Behavioral
- Ventilation

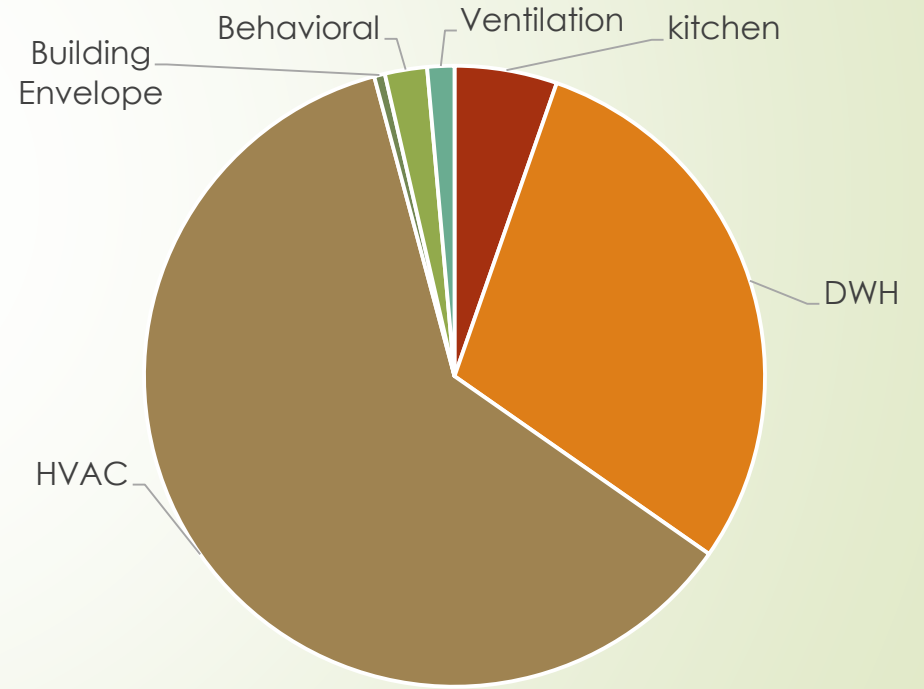
Natural Gas Technical and Economic Potential K-12 Schools by End-Use

Natural Gas Technical



- kitchen
- DWH
- HVAC
- Building Envelope
- Behavioral
- Ventilation

Natural Gas Economic



- kitchen
- DWH
- HVAC
- Building Envelope
- Behavioral
- Ventilation



Public Sector EE Potential – Summary data

Individual and Aggregate EE potential for the Public Sector

Public Sector Electric Potential

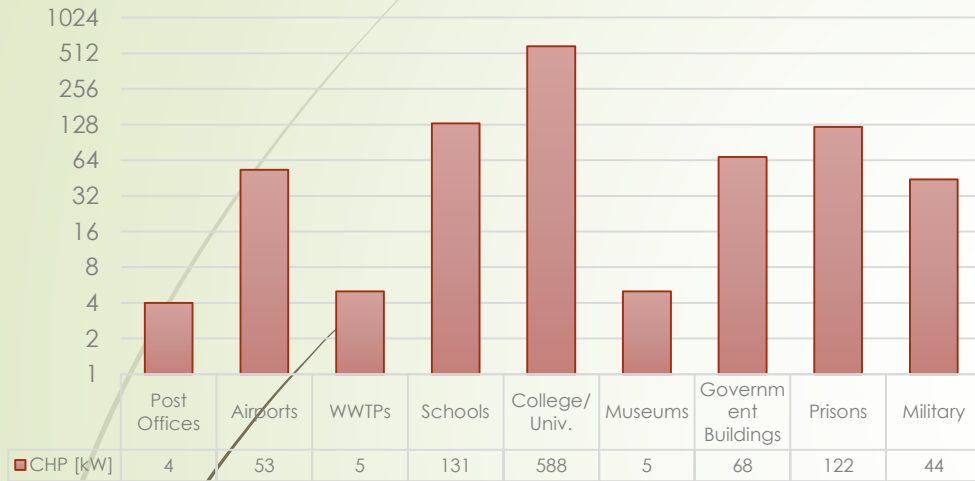
Electric	Technical		Economic	
	%	kWh	%	kWh
Airports	14%	59,850,415	12%	53,562,629
Community Colleges	19%	77,631,582	13%	52,973,207
Correctional Facilities	41%	86,116,307	14%	29,888,345
k-12	38%	828,399,007	28%	613,723,220
Libraries	48%	76,525,677	35%	55,573,569
Medical	47%	131,691,433	28%	77,389,205
Muni	37%	1,819,213,124	25%	1,259,958,647
Park Districts	30%	125,734,436	20%	82,879,204
Police and Fire Stations	27%	359,354,172	25%	333,331,404
Universities	12%	246,182,567	9%	214,921,434
Waste Water	16%	189,401,935	15%	174,753,157
Total	32%	4,000,100,654	24%	2,948,954,020

Public Sector Natural Gas Potential

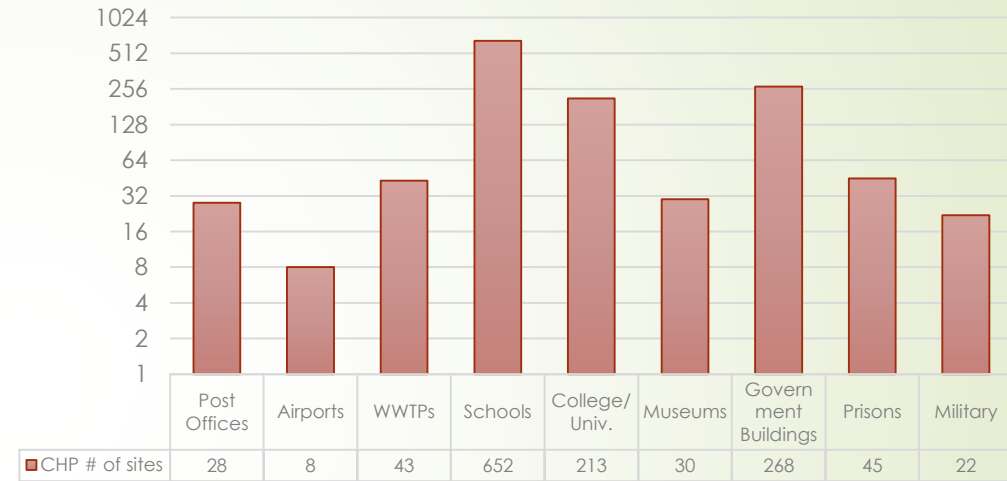
Natural Gas	Technical		Economic	
	%	Therms	%	Therms
Airports	48%	6,198,559	26%	3,356,227
Community Colleges	53%	9,121,073	39%	6,640,553
Correctional Facilities	26%	5,335,668	19%	3,854,456
k-12	56%	68,677,479	34%	42,758,645
Libraries	46%	3,419,600	30%	2,229,698
Medical	62%	5,132,198	21%	1,733,995
Muni	51%	35,800,895	37%	25,946,439
Park Districts	30%	8,194,783	25%	6,865,702
Police and Fire Stations	39%	18,689,334	28%	13,381,219
Universities	44%	48,508,427	44%	47,580,733
Waste Water	35%	20,863,469	23%	13,796,125
Total	46%	229,941,485	33%	165,304,695

CHP Technical Potential

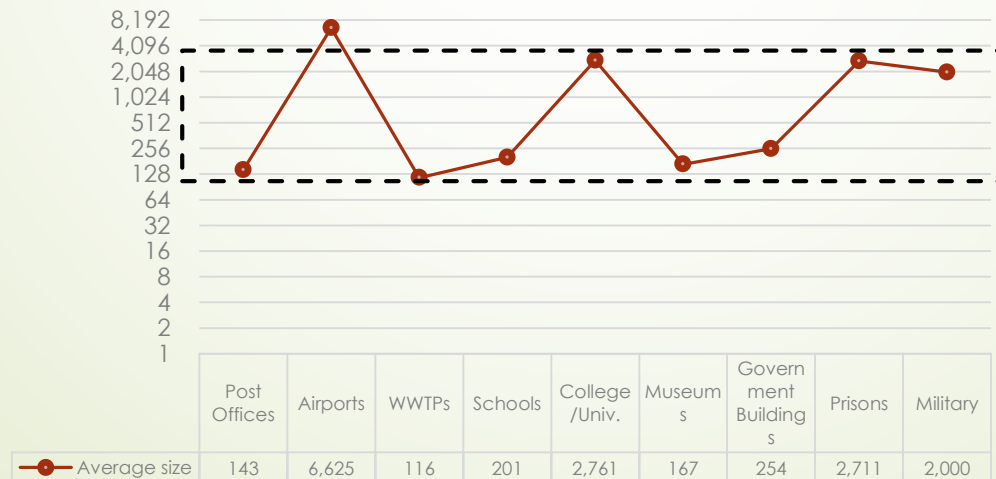
CHP Technical Potential [MW]



CHP Technical Potential [# of sites]



CHP Technical Potential [Typical Installation]



Shaded Area: Target CHP Program Design

Source: DOE Combined Heat and Power (CHP) Technical Potential in the United States



CHP Technical Potential

- ▶ Key takeaways:
 - ▶ 1.02 GW of potential over 1,300 sites
 - ▶ About 70% (700MW) in the program sweet-spot
- ▶ Program experience (Department pilot)
 - ▶ Applications >30MW over 17 sites
 - ▶ Median size: 760 kW
 - ▶ 7 Selected, 4 funded

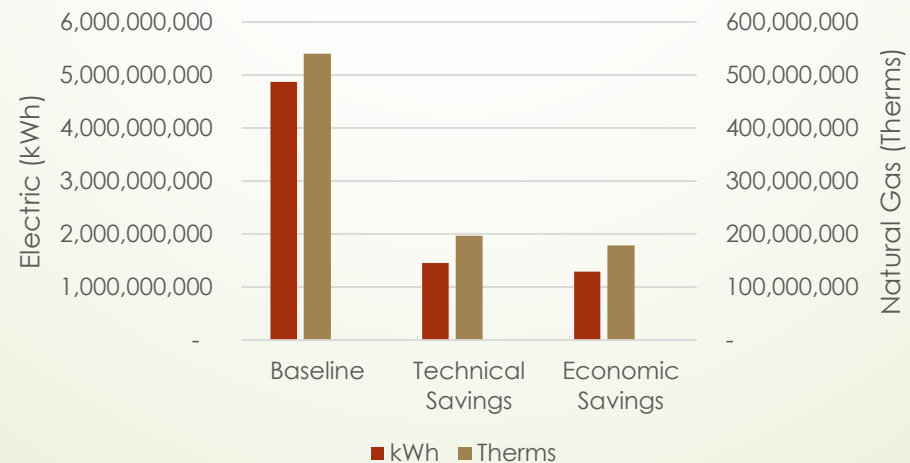


Low Income Summary Data

Low Income Single Family – Technical & Economic Potential

	Total Consumption	Technical	Technical Potential	Economic	Economic Potential
Electric	4,870,220,000	29.86%	1,454,247,692	26.49%	1,290,121,278
Natural Gas	540,212,000	36.42%	196,745,210	33.00%	178,269,960

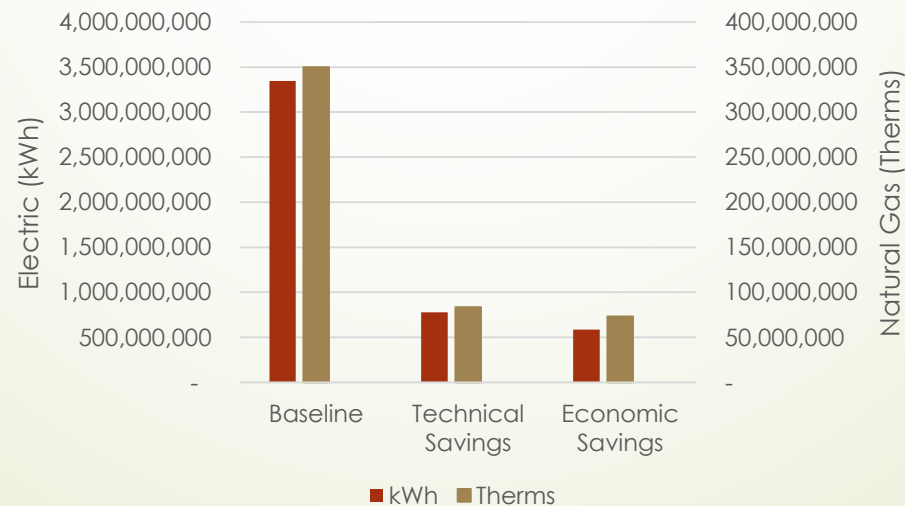
Low Income Single Family Baseline and Savings Potential



Low Income Multi-Family – Technical & Economic Potential

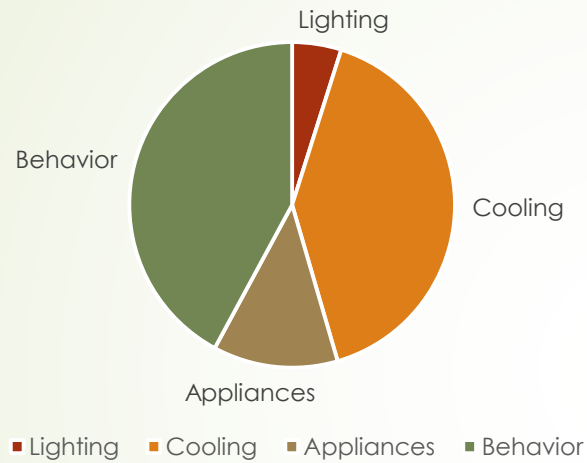
	Total Consumption	Technical	Technical Potential	Economic	Economic Potential
Electric	3,344,131,000	22.94%	777,657,957	17.18%	584,911,951
Natural Gas	349,681,000	23.87%	83,468,855	20.96%	73,293,138

Low Income Multi-Family Baseline and Savings Potential

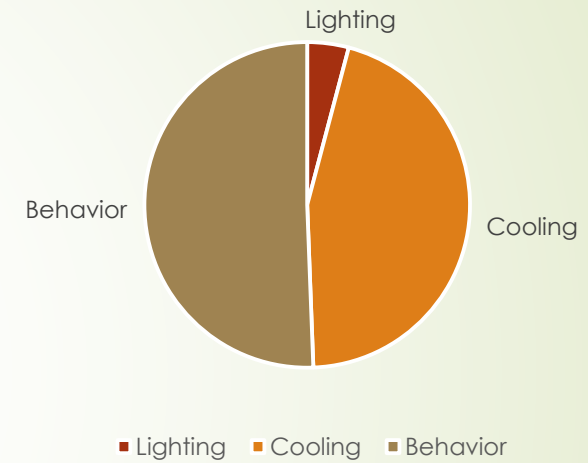


EE Potential LI-SF by End-Use

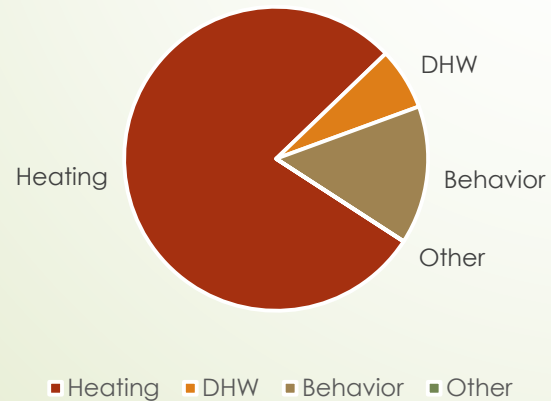
Electric, Technical



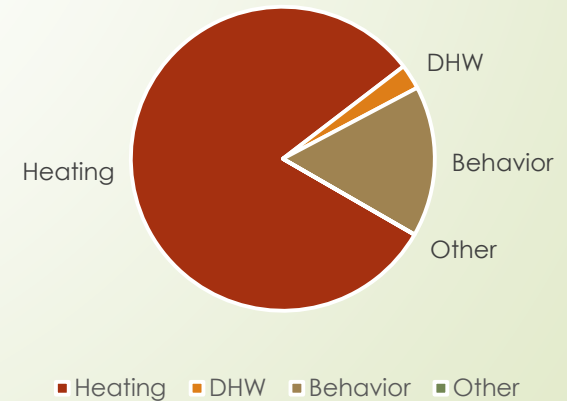
Electric, Economic



Natural Gas, Technical

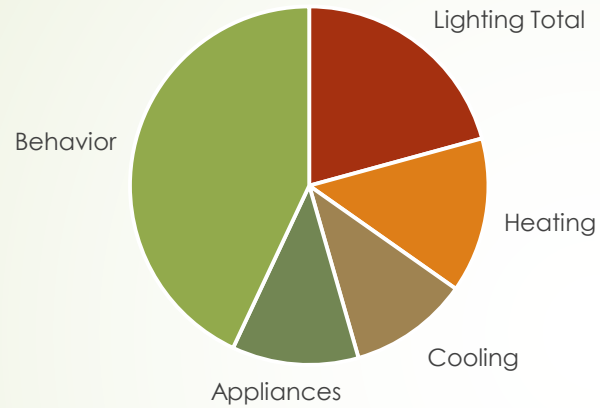


Natural Gas, Economic



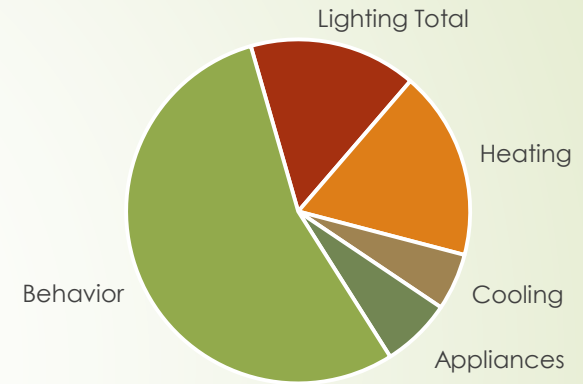
EE Potential LI-MF by End-Use

Electric, Technical



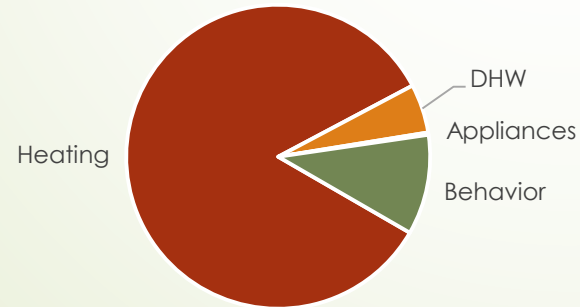
■ Lighting Total ■ Heating ■ Cooling ■ Appliances ■ Behavior

Electric, Economic



■ Lighting Total ■ Heating ■ Cooling ■ Appliances ■ Behavior

Natural Gas, Technical



■ Heating ■ DHW ■ Appliances ■ Behavior


Natural Gas, Economic



■ Heating ■ DHW ■ Behavior



Achievable Potential



Maximum & Program Achievable Potential

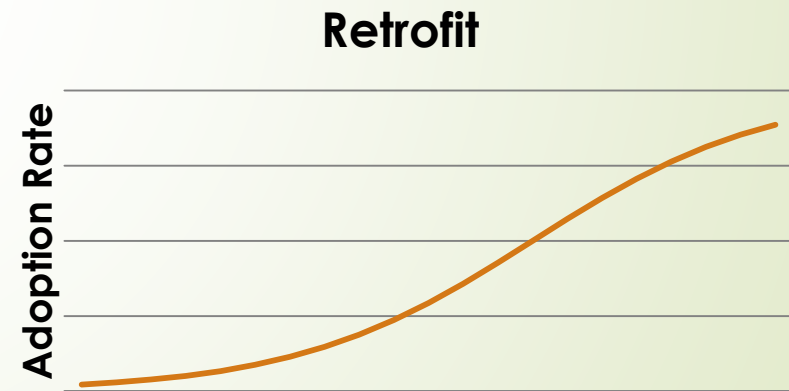
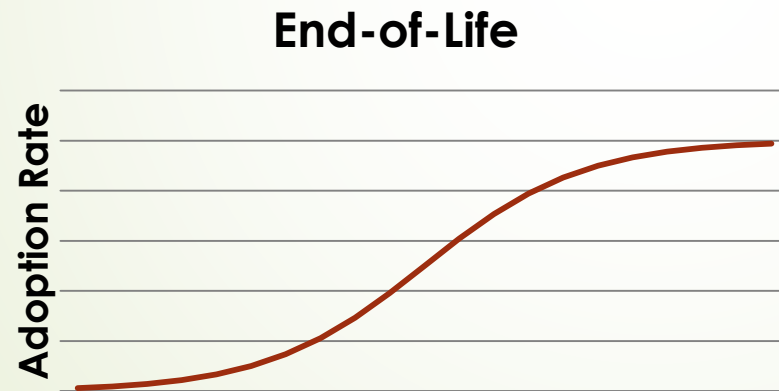
- Achievable Potential done at program level rather than measure level (to represent EE delivery method, by program)
- **Maximum Achievable Potential:** Calculated at program level (2017-2022) assuming the most aggressive program scenario
- **Program Achievable Potential:** Subset of maximum achievable potential based on available funding and established incentive rates

Achievable Potential Approach

- ▶ Developed Sigmoid Function to model adoption of energy efficiency incentives by market
 - ▶ Curves developed for both **end-of-life** and **retrofit**
 - ▶ Curves vary by measure based on previous Department's customer participation
 - ▶ Adjusted each year as necessary to account for changes in baseline, market size and saturation
- ▶ Market barriers taken into account by model
 - ▶ Limited potential units to replace
 - ▶ Incentive program knowledge of customers
 - ▶ Potential benefits to customer
 - ▶ Program design/delivery
 - ▶ Lack of motivation to change system/apply for incentives

Maximum & Program Achievable

- ▶ Based on available funding for 2017-2022
- ▶ Developed both end-of-life and retrofit S-Curves
- ▶ Incentives based on Department's Program forecasted budgets and incentive level payment
- ▶ Potential based on number of measures adopted each year



Illustrative Purposes Only



Achievable Example: Public Sector Boiler Replacement

- ▶ Boiler Lifetime – 35 years
- ▶ Annual Natural Market Replacement – 3%

At 50% incentive rate:

- ▶ 0.2% Retrofit
- ▶ 25.0% EOL

At 80% incentive rate:

- ▶ 0.6% Retrofit
- ▶ 46.7% EOL



Maximum Achievable Example: Public Sector Boiler Replacement

- ▶ Raise incentive to 100% of incremental cost
 - ▶ Expect to be able to provide incentives to 2.21% of market if budget not an issue
- ▶ Market size of 97 billion kbtuh
- ▶ Expect to be able to provide incentives for
 - ▶ Affecting 214 million kbtuh
 - ▶ Resulting in 6.99 million therms saved
- ▶ Cost of \$42 million in incentives



Program Achievable Example: Public Sector Boiler Replacement

- ▶ Based on budget constraints and program delivery
 - ▶ 22 million kbtuh affected
 - ▶ 0.724 million therms saved
- ▶ Cost of \$4 million in incentives

Public Sector – Preliminary MAX Achievable

	2017	2018	2019	2020	2021	2022
% Electricity MAX	3.64%	3.04%	2.84%	2.69%	2.54%	2.43%
% Natural Gas MAX	3.37%	3.42%	3.42%	3.41%	3.41%	3.40%

	2017	2018	2019	2020	2021	2022
% Cumulative Electricity MAX	3.64%	6.68%	9.53%	12.22%	14.75%	17.18%
% Cumulative Natural Gas MAX	3.37%	6.79%	10.20%	13.62%	17.02%	20.42%

Public Sector – Preliminary Program Achievable

	2017	2018	2019	2020	2021	2022
% Electric	0.97%	0.81%	0.76%	0.71%	0.67%	0.64%
% Natural Gas	0.77%	0.78%	0.78%	0.78%	0.78%	0.78%

	2017	2018	2019	2020	2021	2022
% Cumulative Electricity	0.97%	1.78%	2.53%	3.25%	3.92%	4.57%
% Cumulative Natural Gas	0.77%	1.56%	2.34%	3.13%	3.91%	4.69%

Low Income – Preliminary MAX Achievable

	2017	2018	2019	2020	2021	2022
% Electricity MAX	3.06%	2.55%	2.39%	2.26%	2.13%	2.04%
% Natural Gas MAX	2.20%	2.16%	2.11%	2.06%	2.02%	1.98%

	2017	2018	2019	2020	2021	2022
% Cumulative Electricity MAX	3.06%	5.61%	8.00%	10.26%	12.40%	14.44%
% Cumulative Natural Gas MAX	2.20%	4.36%	6.47%	8.53%	10.56%	12.54%

Low Income – Preliminary Program Achievable

	2017	2018	2019	2020	2021	2022
% Electric	0.25%	0.21%	0.20%	0.18%	0.17%	0.17%
% Natural Gas	0.26%	0.26%	0.26%	0.26%	0.25%	0.23%

	2017	2018	2019	2020	2021	2022
% Cumulative Electric	0.25%	0.46%	0.66%	0.84%	1.02%	1.18%
% Cumulative Natural Gas	0.26%	0.53%	0.79%	1.04%	1.29%	1.52%



Coming Soon

- Economically Efficient Potential
 - Sensitivity Analysis
 - Report
- 



Conclusions



Questions?



Thank you!