

THE
CADMUS
GROUP, INC.

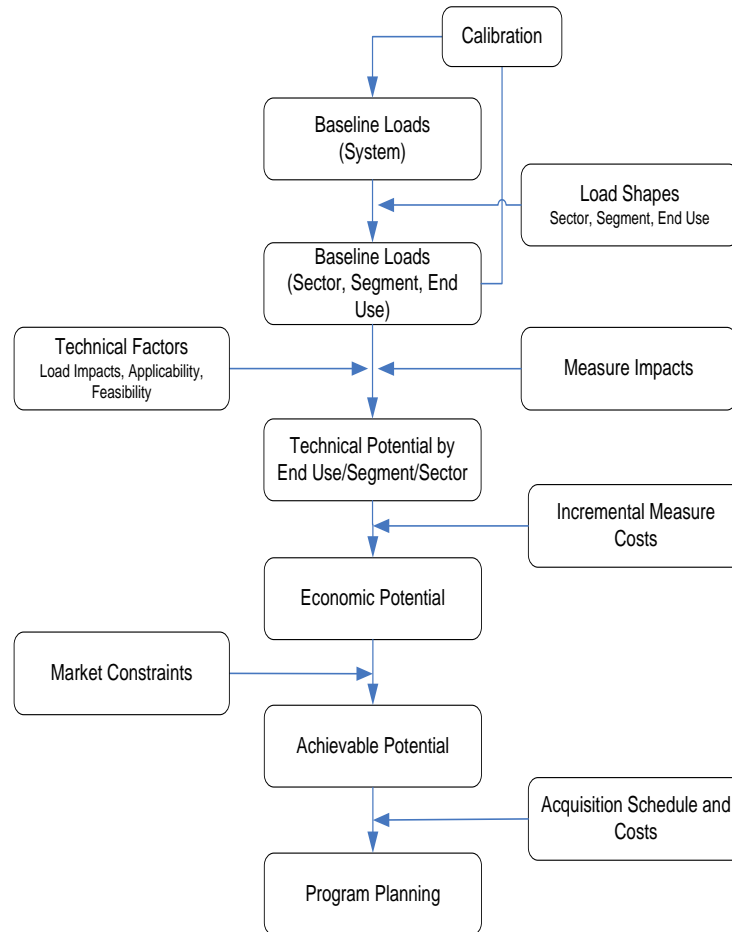
Ameren Illinois Utilities Draft Potential Study Results

Presented to:
Illinois Stakeholder Advisory Group
January 26, 2010

Agenda

- Overview of Methodology and Terms
- Technical and Economic Potentials
- Achievable Potential and Energy Efficiency Targets

Overview of Methodology



Review of Primary Market Research Activities

- Residential
 - 400 telephone surveys
 - 50 on-site surveys
- Commercial
 - 69 on-site surveys
- Industrial
 - 3 on-site surveys of large customers
- Trade Allies
 - 52 telephone surveys of builders, contractors, retailers, and vendors
- Results presented to SAG October 26, 2009

Resource Potential Definitions

- Technical Potential
 - The savings that would result if all of the most efficient measures/technologies were adopted by customers. The only constraints are physical limitations, with no consideration of cost, customers' willingness to participate, or other market barriers.
- Economic Potential
 - The portion of technical potential including measures/technologies that are deemed cost-effective.
- Achievable (Program) Potential
 - The portion of economic potential deemed achievable after accounting for market barriers and customers' willingness to participate at projected levels of incentives and program spending.

Steps in Estimating Potential

- Create Baseline End Use Forecast
 - Sales segmented by sector, market segment, and end use
 - Ameren customer forecasts incorporated to calibrate to sales forecast
- Estimate Technical Potential
 - Alternative forecast created assuming all technically feasible measures installed
- Estimate Economic Potential
 - Measures screened for cost-effectiveness using hourly (electric) or monthly (natural gas) avoided costs and loadshapes. Capacity benefits during peak periods included for electric measures. Ameren discount rate and line losses used.
 - Measures with a Benefit-Cost ratio of 1.0 or greater included in economic potential
- Estimate Achievable Potential
 - Expected market penetration percents applied to economic potential, informed by primary data collection, best practices, and benchmarking

Measures Analyzed

- Comprehensive database of measures appropriate to AIU service territory, including measures currently offered through AIU programs

Sector	Electricity		Natural Gas	
	Unique Measures	Permutations	Unique Measures	Permutations
Residential	127	1472	55	507
Commercial	128	1881	56	1073
Industrial	16	221	8	54
Total	271	3,574	119	1,634

- Data collected on costs, savings, life, and applicability for all 5,000+ permutations across fuel, sector, segment, end use and vintage

Measure Categories

- Measures classified into three distinct groups:
 - **Existing retrofit** represents retrofit opportunities in existing construction. Some examples of measures included in this group are shell improvements (insulation, weather-stripping, etc.), lighting upgrades (e.g. CFLs), and early replacement of equipment. This potential is considered “discretionary” because it exists in existing building stock and is available for acquisition at any point in the study.
 - **Equipment replacement** refers to efficiency upgrades during normal replacement of equipment in existing buildings. This includes efficient end-use equipment such as central air conditioners and ENERGY STAR appliances. The availability of these resources is driven by equipment burnout rates, and if the opportunity to upgrade is missed, it must wait until the new equipment burns out.
 - **New construction** includes measures from the above two categories as they apply to new construction. For some retrofit measures, costs and savings will be different from existing construction due to different baseline conditions (building code vs. existing conditions). The availability of this potential is driven by Ameren’s new construction forecast. Missed efficiency upgrades will typically need to wait until the installed technologies need to be replaced.

Electric Technical and Economic Potentials

Electric Technical and Economic Potential by Sector (Cumulative from 2010 to 2016)

Sector	Baseline Sales (MWh)	Technical Potential (MWh)	Technical Potential as % of Baseline	Economic Potential (MWh)	Economic Potential as % of Baseline	Average Levelized Cost (\$/kWh)
Residential	12,005,689	3,797,892	32%	2,526,901	21%	\$0.05
Commercial	14,746,277	3,609,271	24%	2,419,946	16%	\$0.04
Industrial	14,030,164	1,591,086	11%	1,591,086	11%	\$0.01
Total	40,782,130	8,998,248	22%	6,537,934	16%	\$0.04

Natural Gas Technical and Economic Potentials

Natural Gas Technical and Economic Potential by Sector (Cumulative in 2016)

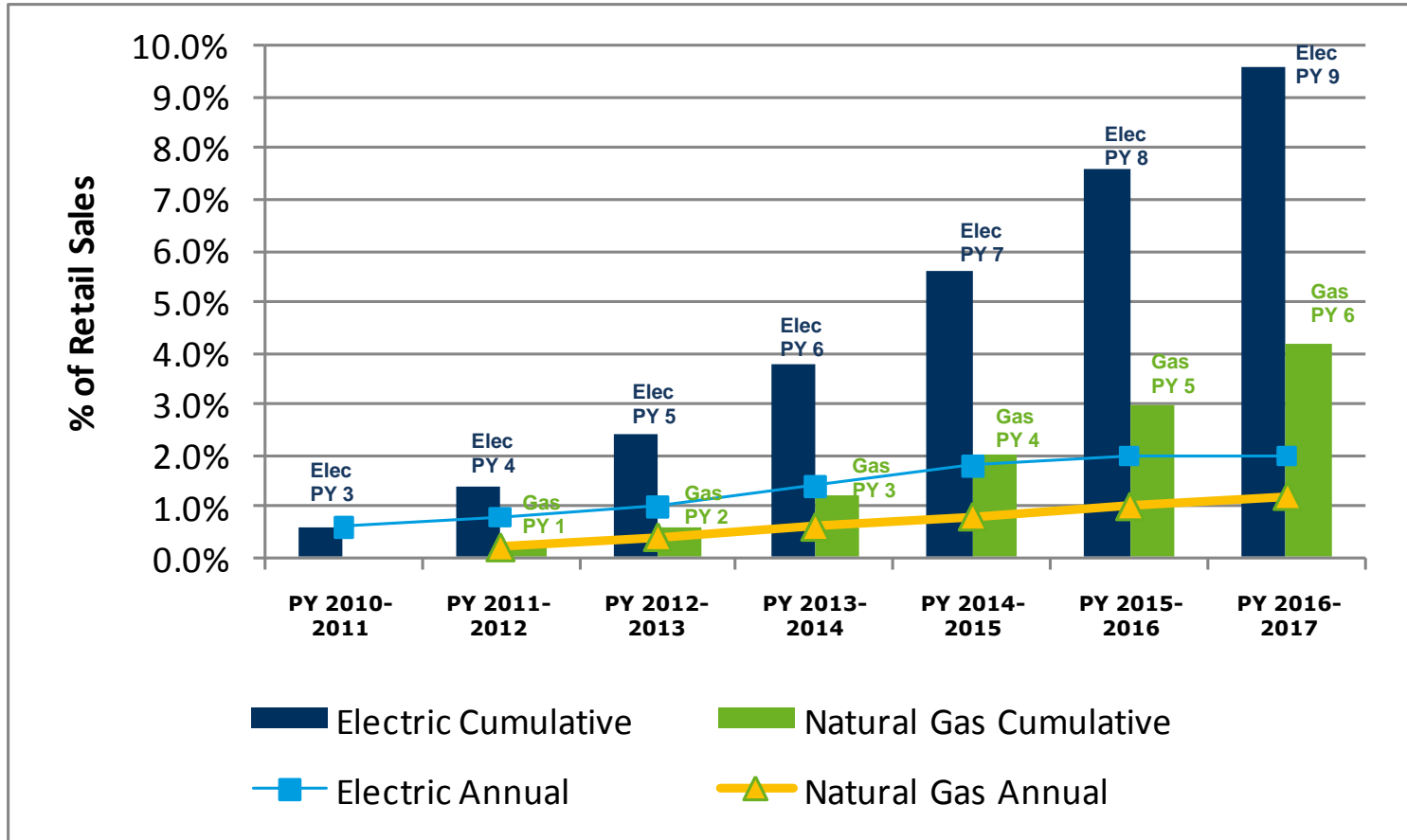
Sector	Baseline Sales (therms)	Technical Potential (therms)	Technical Potential as % of Baseline	Economic Potential (therms)	Economic Potential as % of Baseline	Average Levelized Cost (\$/therm)
Residential	567,406,647	209,775,205	37%	156,981,438	28%	\$0.49
Commercial	270,157,950	89,825,226	33%	37,245,915	14%	\$0.59
Industrial	732,369,238	84,866,123	12%	84,866,123	12%	\$0.09
Total	1,569,933,835	384,466,554	24%	279,093,476	18%	\$0.38

Achievable Potential

Determining Achievable Potential

- Determination of what percent of economic potential is achievable is informed by:
 - Benchmarking against assumed values in other studies
 - Benchmarking against actual achievements in other jurisdictions
 - What can be realistically achieved given existing limits to funding
- How does the identified achievable potential compare to annual savings goals set by Illinois legislation?

Legislative Targets



Impact of Spending Limits on Achieving Goals

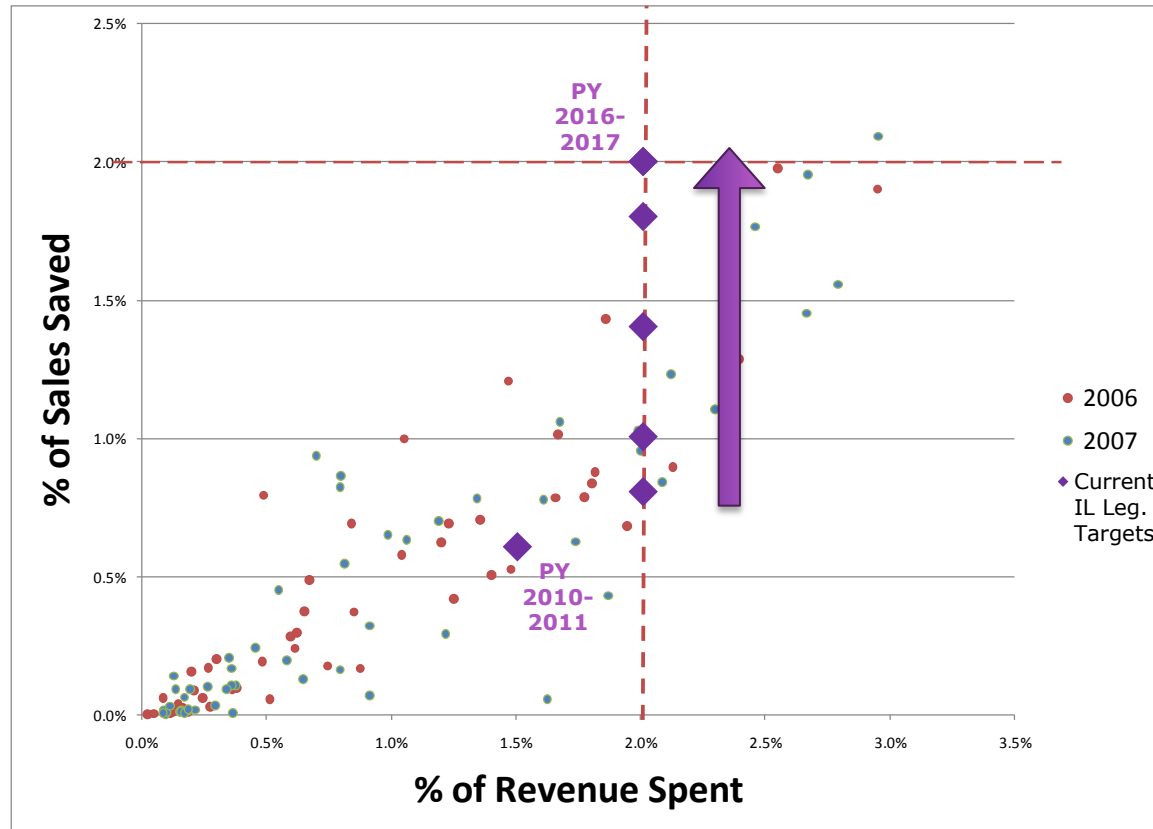
- Electricity
 - 2010: 1.5% of 2007 retail sales
 - (\$0.18 per first year kWh)
 - 2011 and beyond: 2.0% of 2007 retail sales
 - (decreasing to \$0.08 per first year kWh by 2016)
 - 2010 to 2016 average of \$0.10 per first year kWh saved
- Natural Gas
 - 2% of retail sales

Benchmarking

EIA – FERC 861 (2006, 2007)

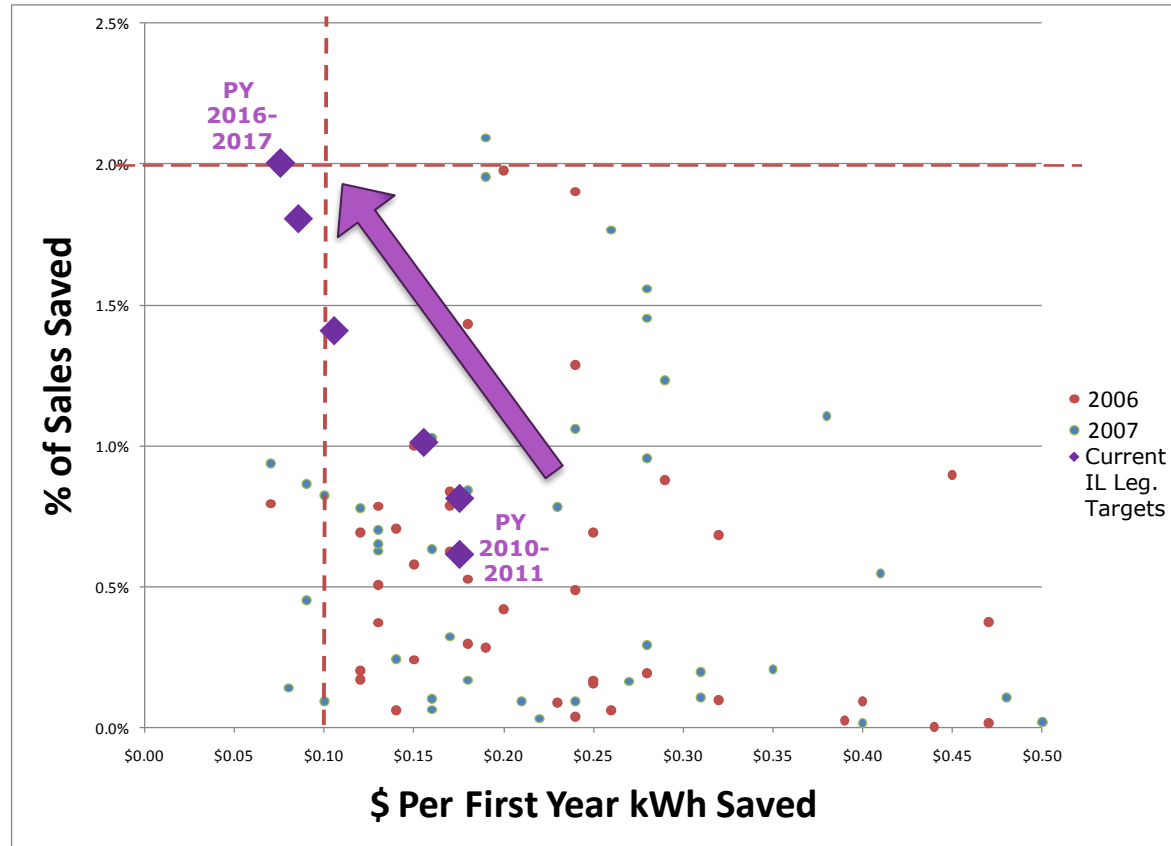
% of Revenue Spent vs. % of Sales Saved Annually

- Trend for '06 and '07 shows that increasing savings requires increased spending
- Few utilities have saved over 1.0% of sales, and only one has reached 2.0% of sales
- Most utilities achieving over 1.0% of sales spent over 2.5% of revenue and saving near 2.0% of sales spent between 2.5% and 3.0% of revenue



EIA – FERC 861 (2006, 2007) \$/kWh vs. % of Sales Saved Annually

- Five utilities spent less than \$0.10 per kWh and those that did achieved less than 1.0% savings
- Utilities saving over 1.5% of sales spent between \$0.20 and \$0.30 per kWh



* Outliers above \$0.50/kWh removed

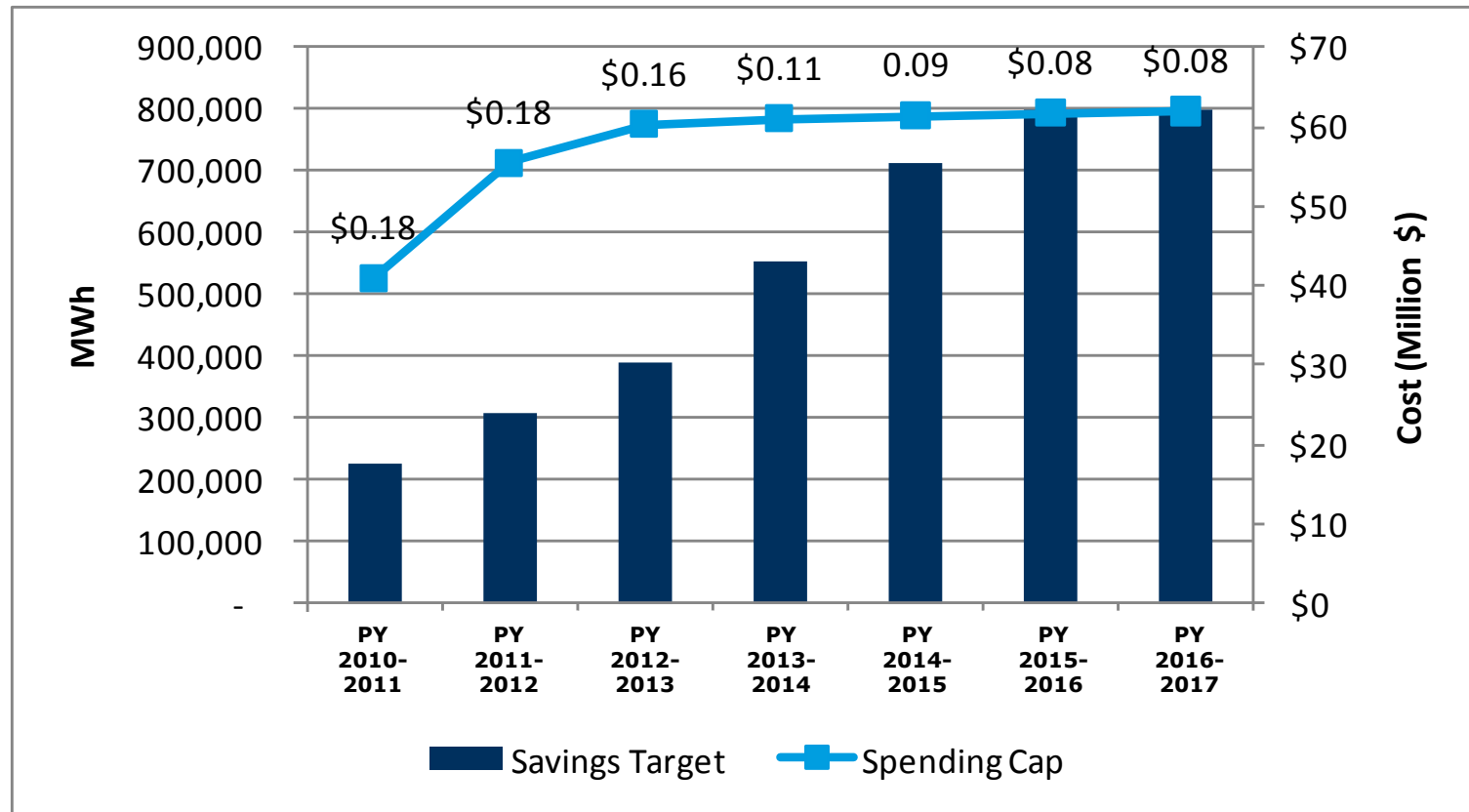
Summary of Potential Study Research

- 60 studies covering 40 states, including four national studies (cumulative % of end year sales):
 - Technical potential: 30 studies
 - Average: 27%
 - Economic potential: 33 studies
 - Average: 21%
 - Maximum achievable potential: 38 studies
 - Average: 17% (81% of economic)
 - Minimum achievable potential: 14 studies
 - Average: 8% (38% of economic)
 - Moderate/likely achievable: 11 studies
 - Average: 9% (43% of economic)
 - Average number of years: 15
 - Implied annual achievable: 0.8% per year

Targets and Achievable Potential

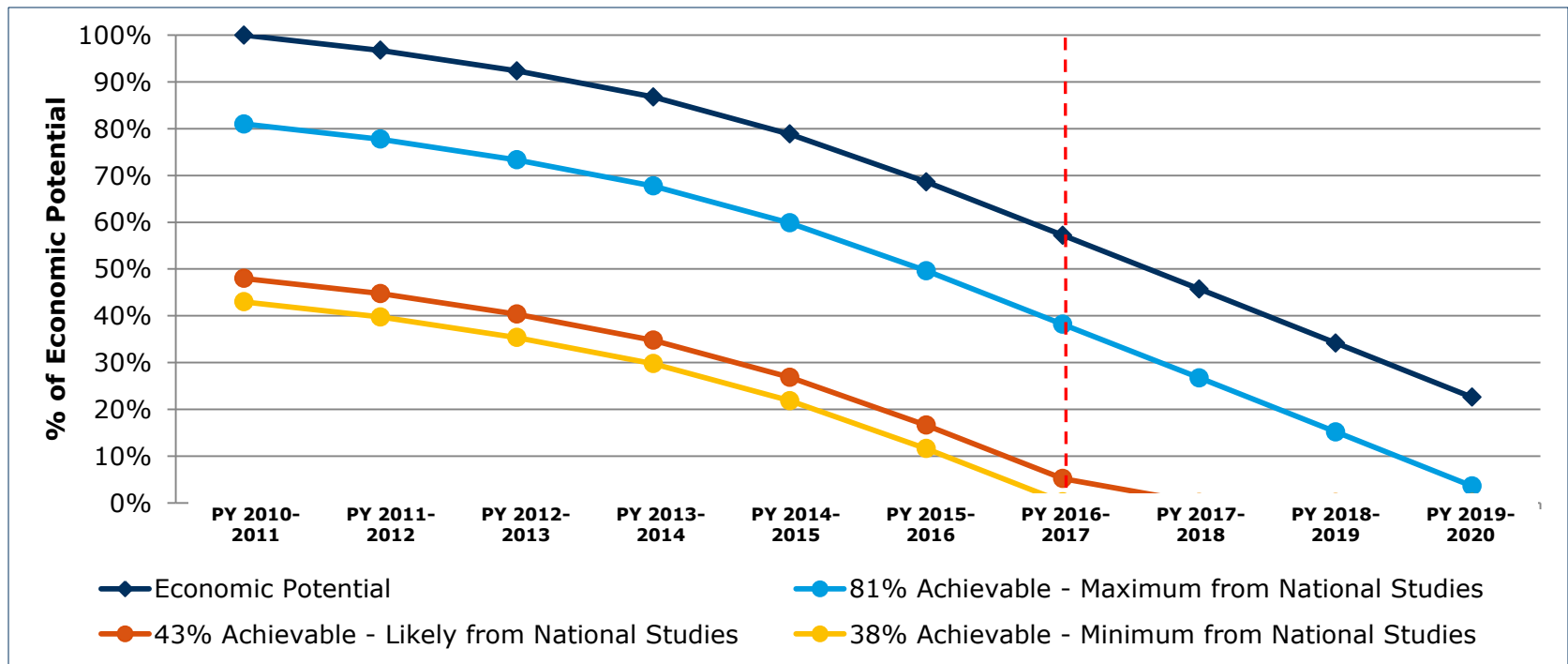
Electric Targets and Spending Caps – 2010 to 2016

- Allowed annual \$/first year kWh shown above bars



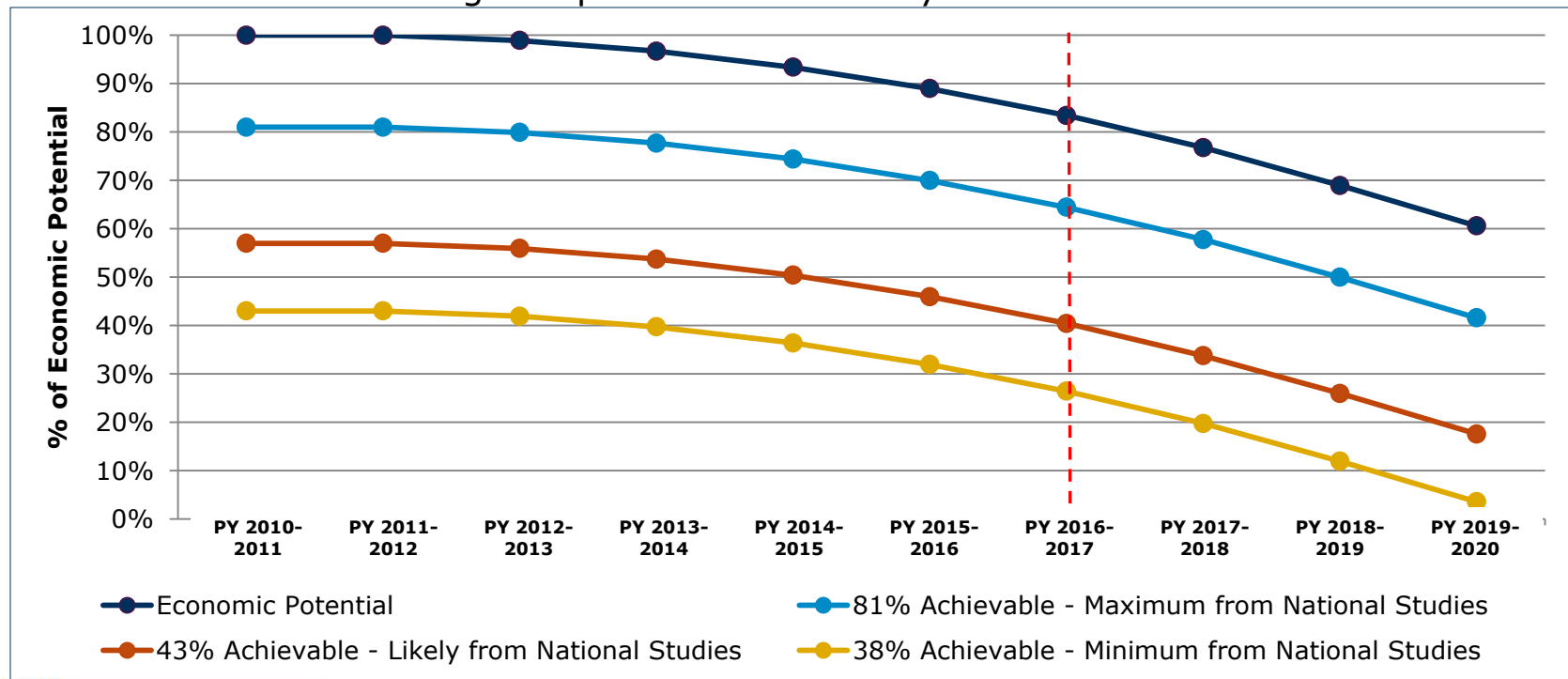
Available Electric Economic Potential by Achievable Scenario

- Assumes targets are met exactly in each year
- Potential exhausted over 10 or fewer years in all but most aggressive scenarios (over 77% achieved)



Available Natural Gas Potential by Achievable Scenario

- Assumes targets are met exactly in each year
- Targets represent 39% of 10-year economic potential
- Percentages are based on electric studies – percent achievable for gas is likely to be lower due to higher up-front cost of many measures



Electric Achievable Potential

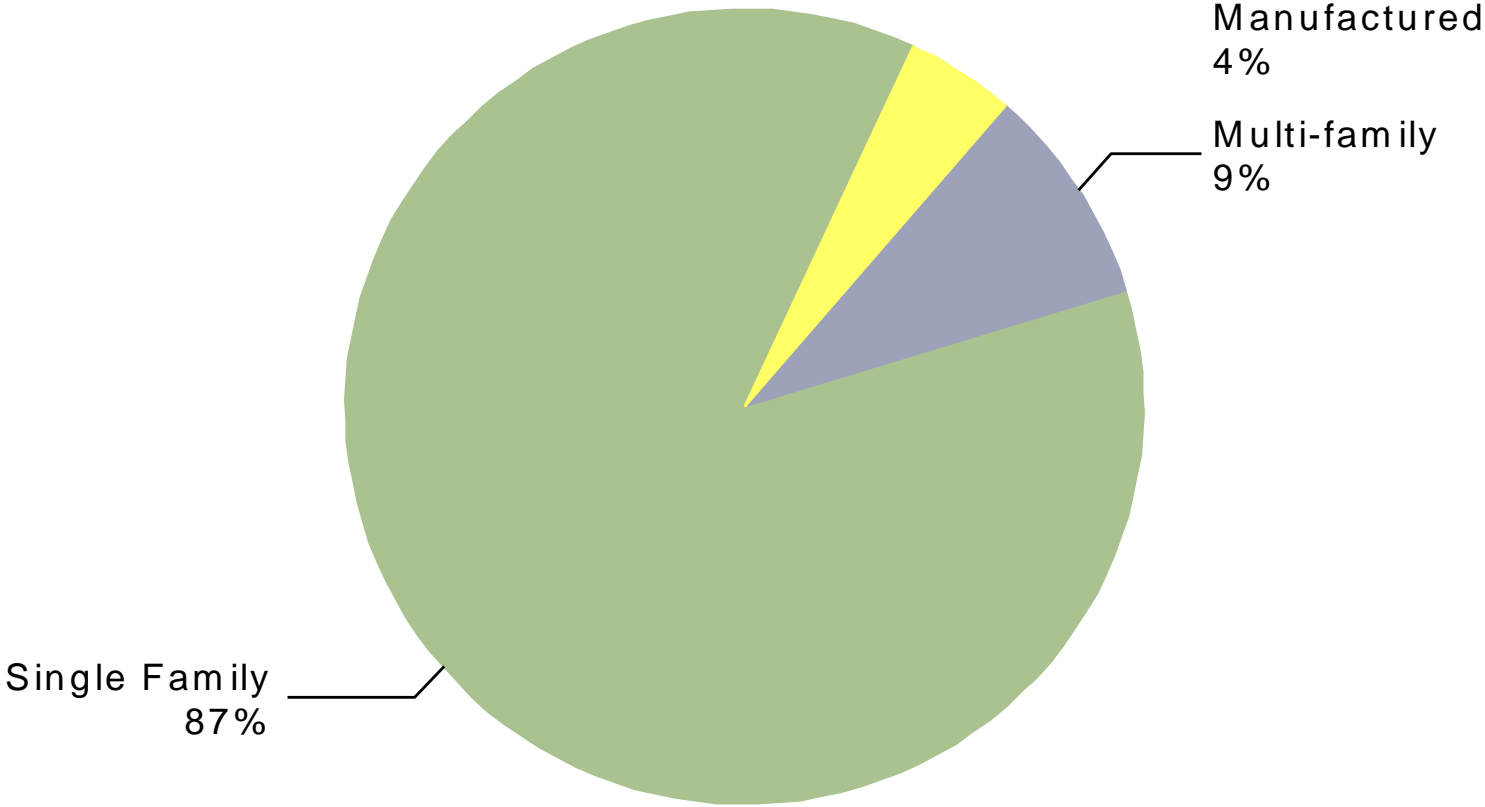
Conclusions

- Legislative targets represent a large portion of economic potential and are extremely aggressive based on utility experience in 2006 and 2007
- Even in most aggressive scenario, potential will be exhausted in 2019
- Will be very difficult to meet savings targets at prescribed spending limits, particularly in later years

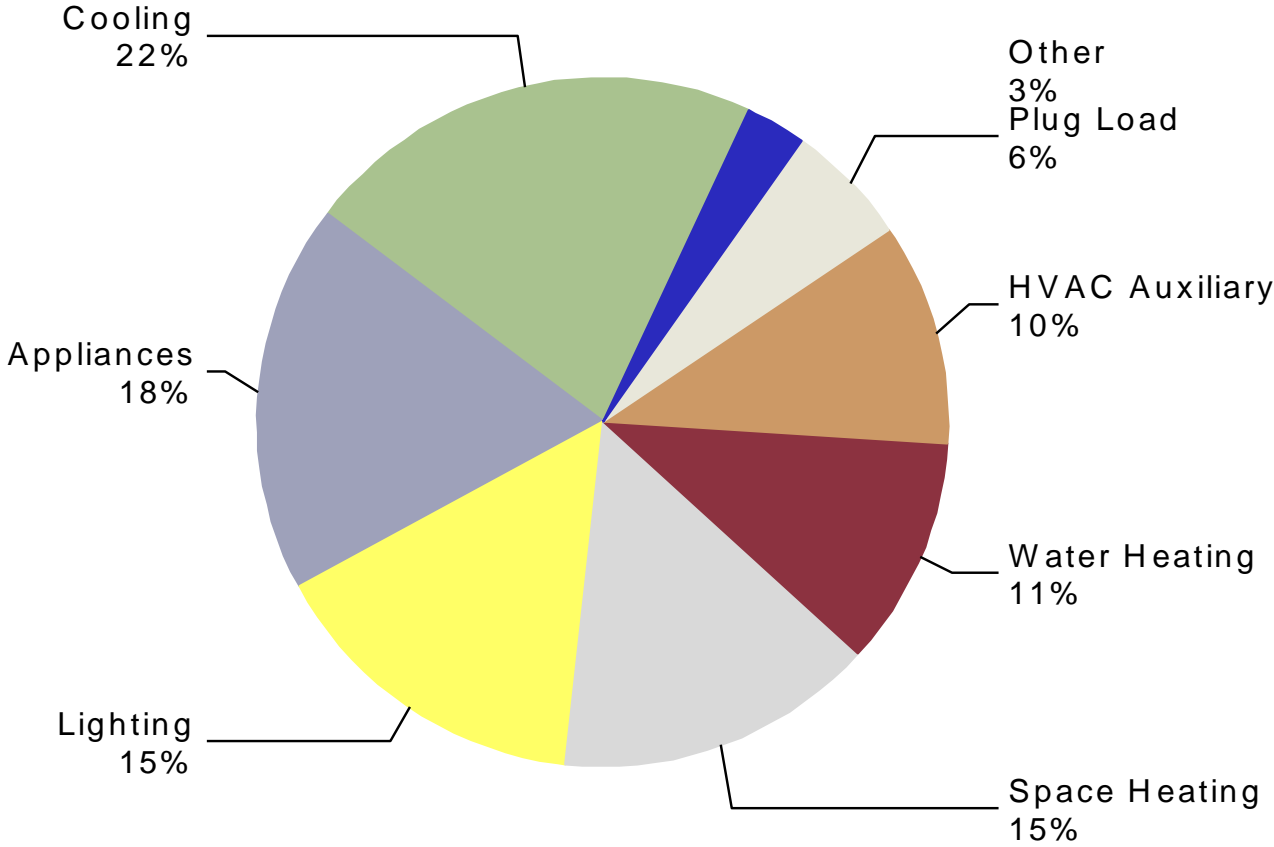
Supplemental Materials

Detailed Electric Economic Potential Results

Residential Electric Economic Potential by Segment

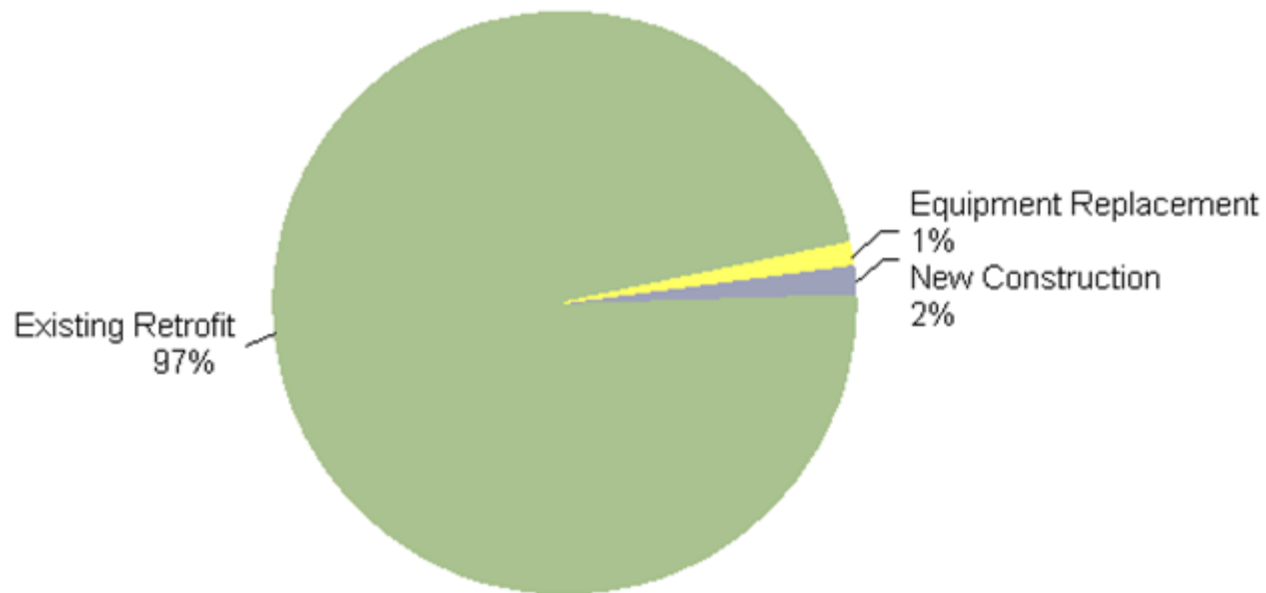


Residential Electric Economic Potential by End Use

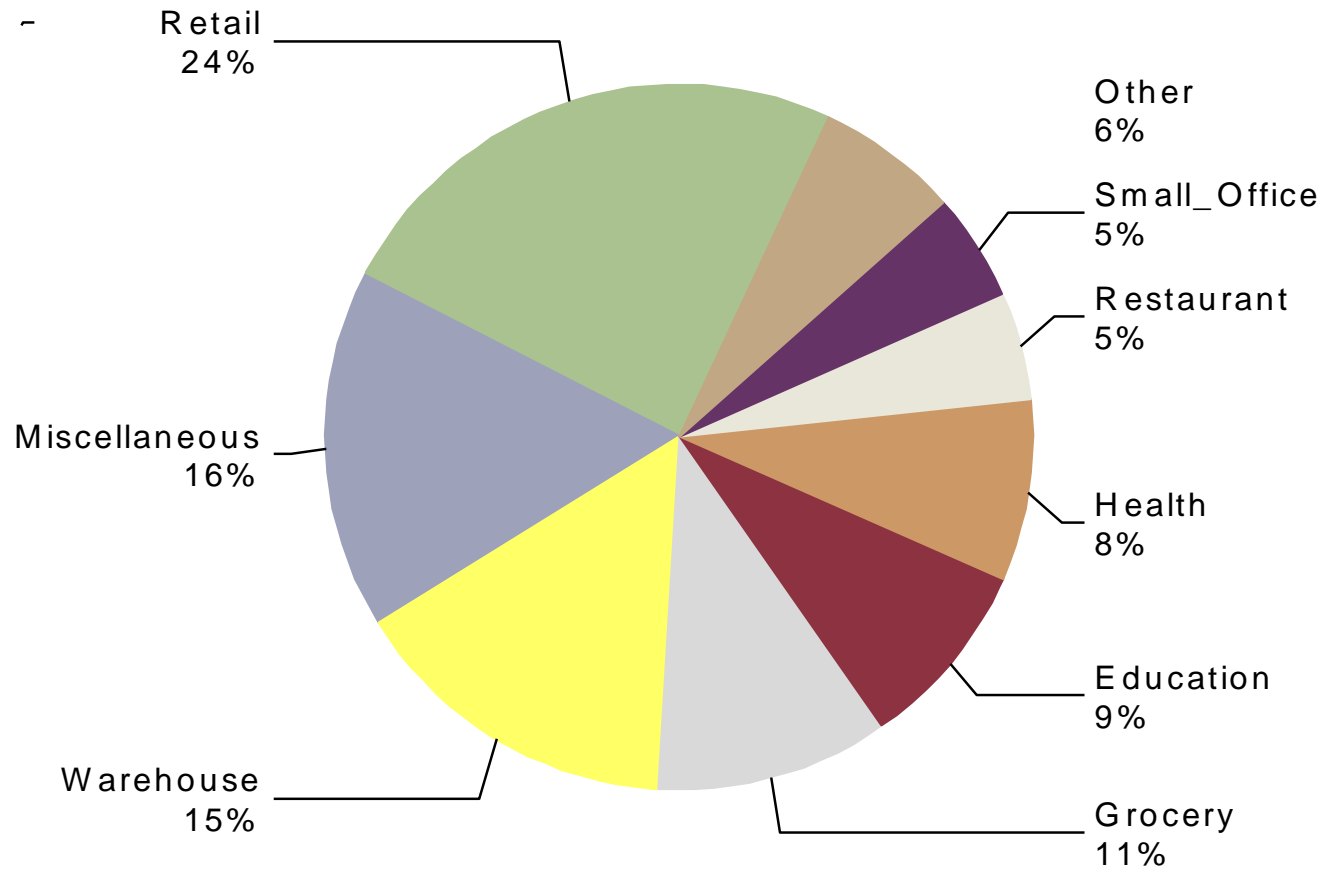


Note: "Other" includes:
Heat Pump: 3%, Pool Pumps: <1%

Residential Electric Economic Potential by Vintage and Measure Type

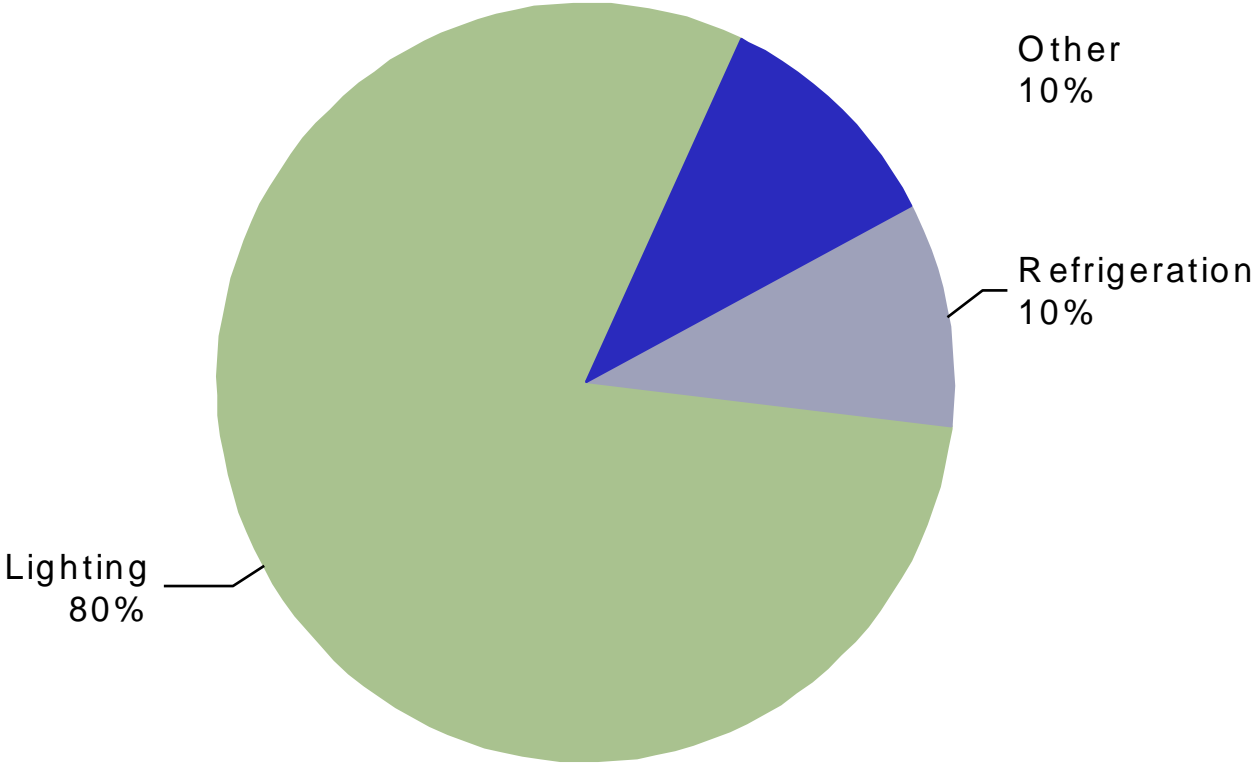


Commercial Electric Economic Potential by Segment



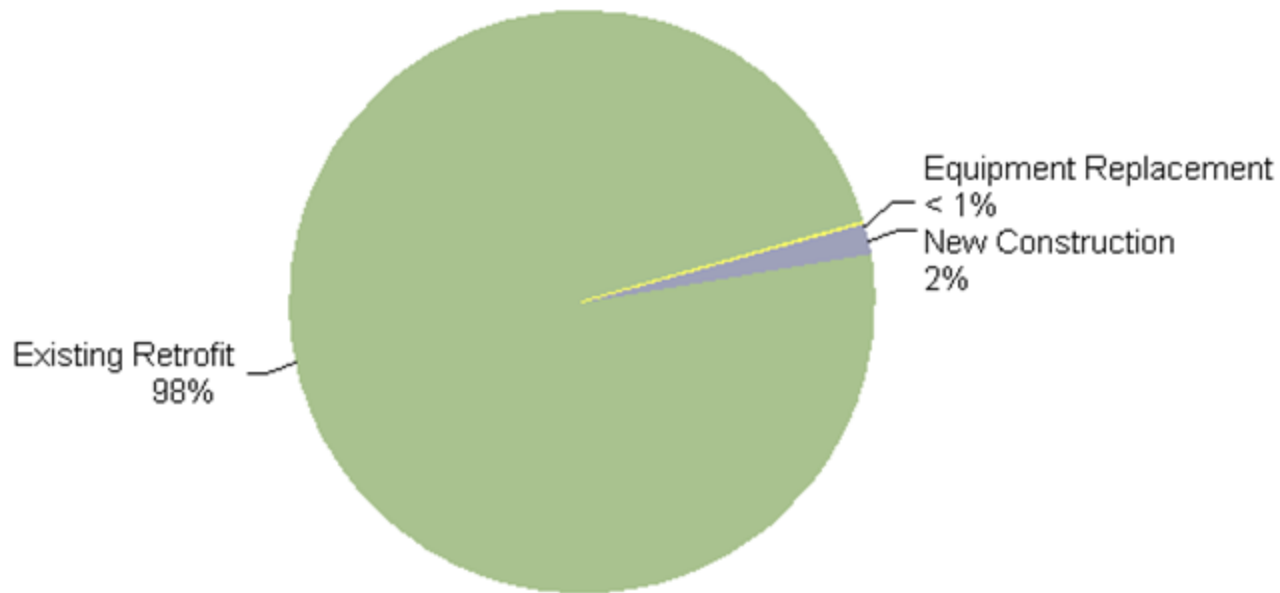
Note: "Other" includes:
Large_Office: 4%, Lodging: 2%

Commercial Electric Economic Potential by End Use

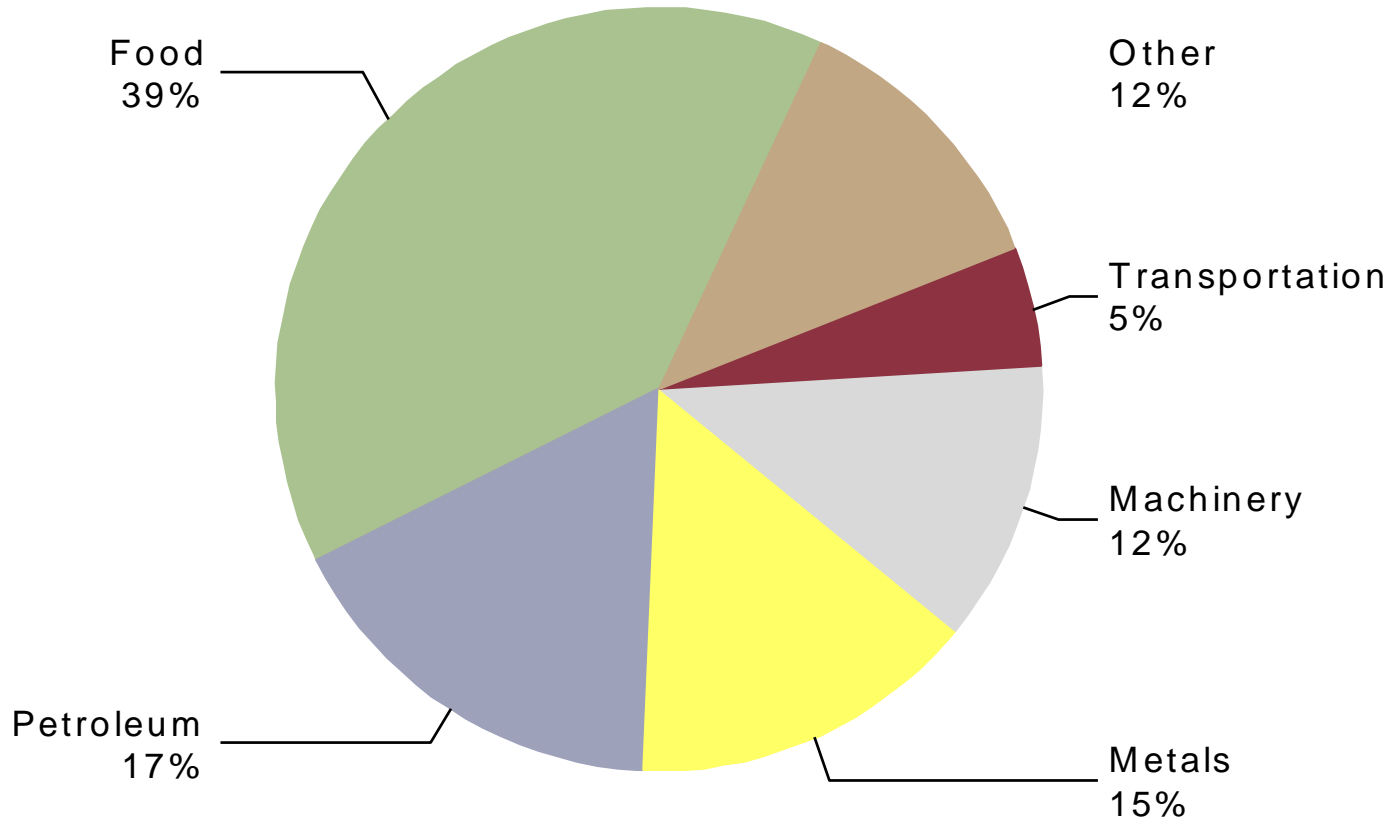


Note: "Other" includes:
Plug Loads: 4%, Cooling: 3%, Heating: 2%, HVAC Auxiliary: 1%, Heat Pump: <1%, Cooking: <1%, Water Heating: <1%

Commercial Electric Economic Potential by Vintage and Measure Type

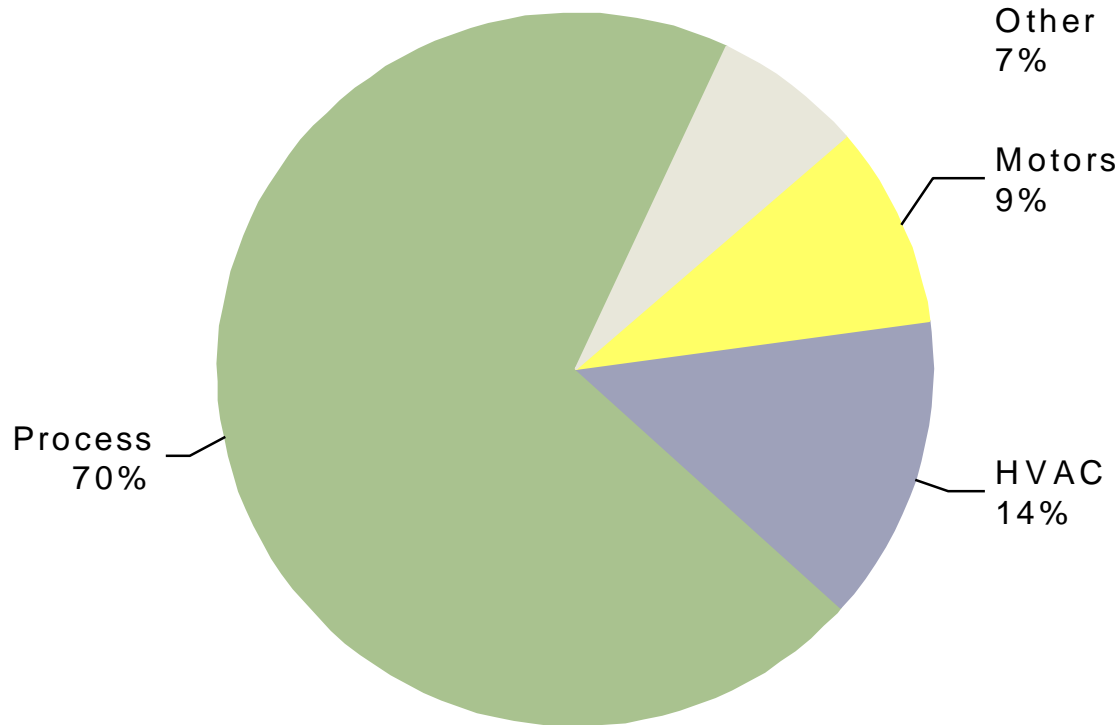


Industrial Electric Economic Potential by Segment



Note: "Other" includes:
Other Industrial: 4%, Plastic/Rubber: 4%, Minerals: 2%, Paper: 1%, Mining: <1%

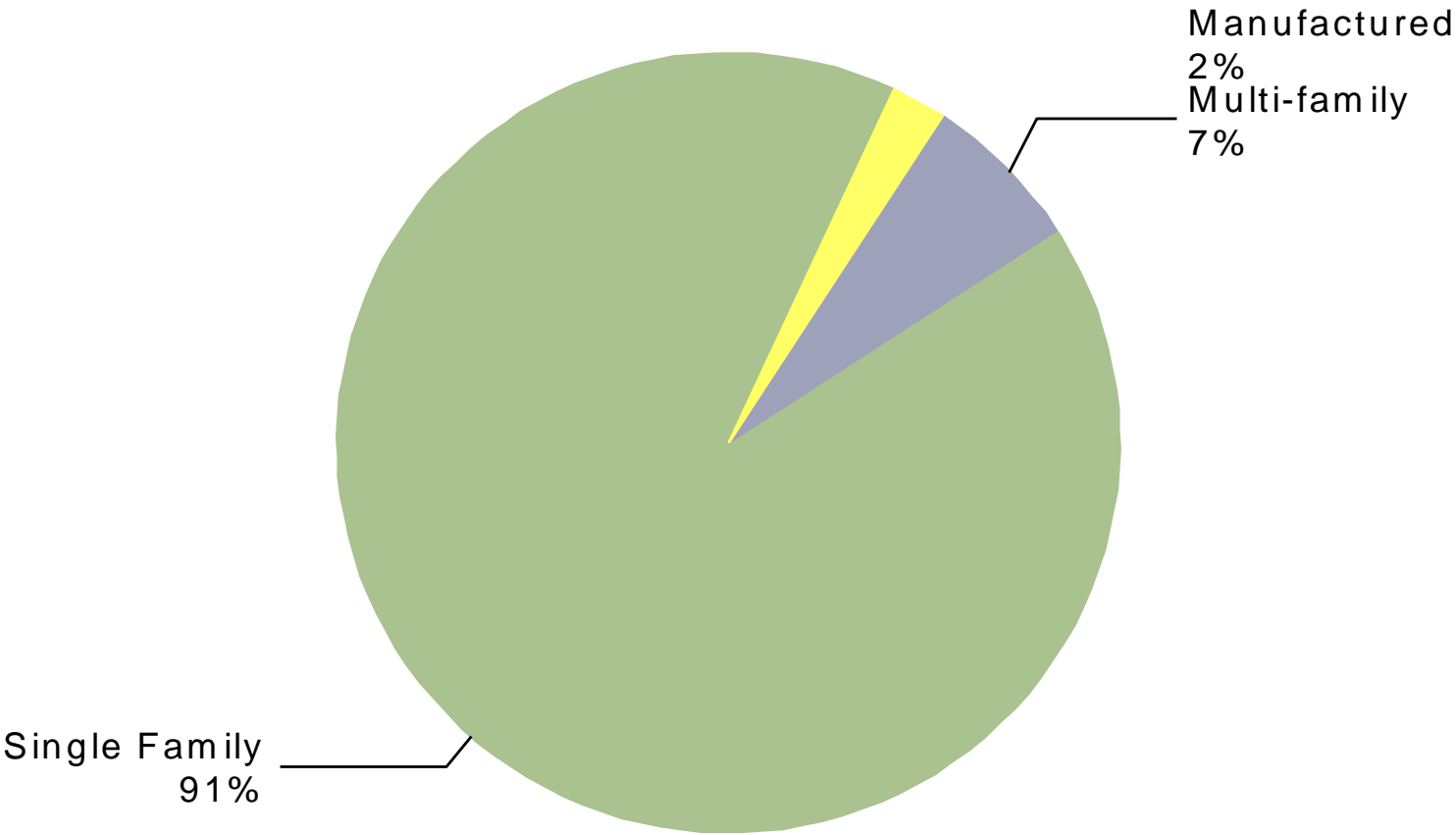
Industrial Electric Economic Potential by End Use



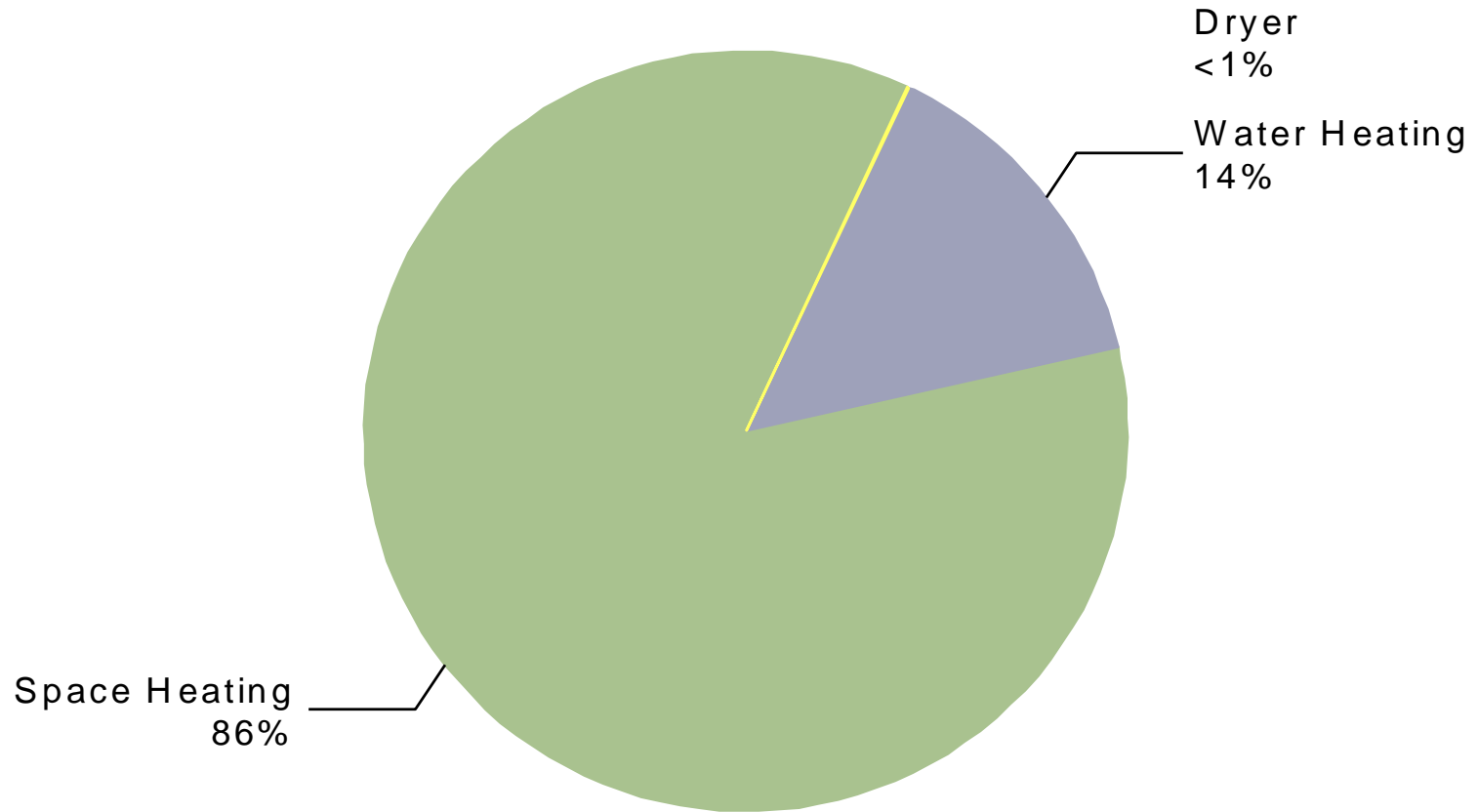
Note: "Other" includes:
Lighting: 5%, Miscellaneous: 2%, Boiler: <1%

Detailed Natural Gas Economic Potential Results

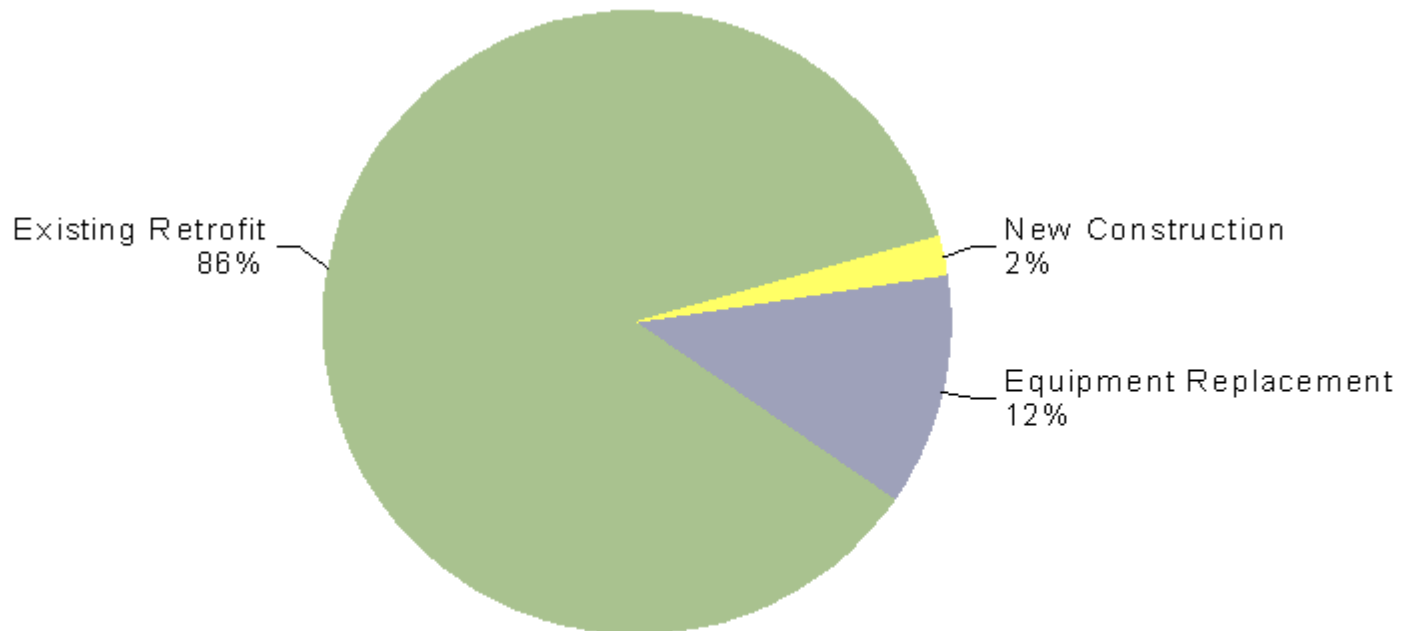
Residential Natural Gas Economic Potential by Segment



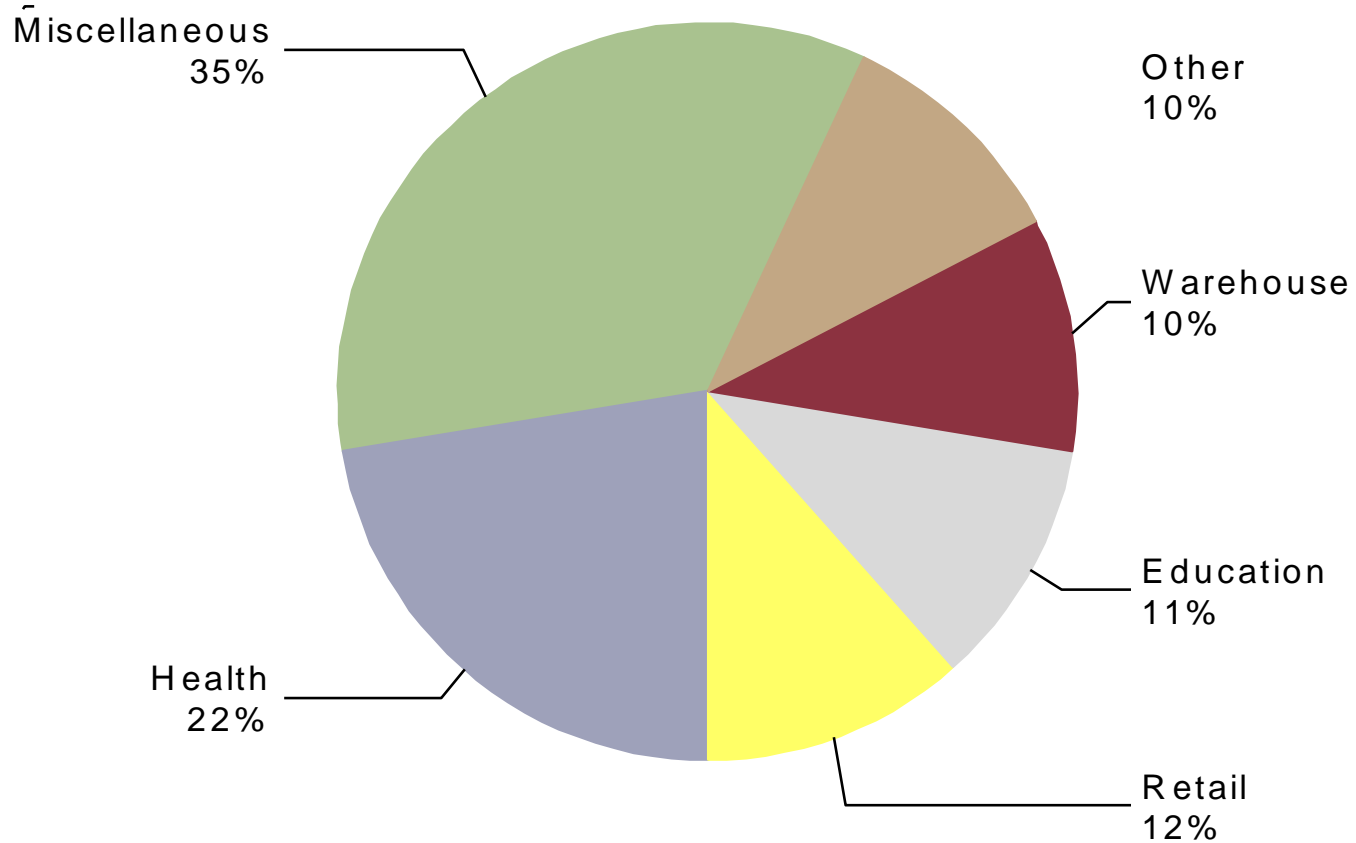
Residential Natural Gas Economic Potential by End Use



Residential Natural Gas Economic Potential by Vintage and Measure Type

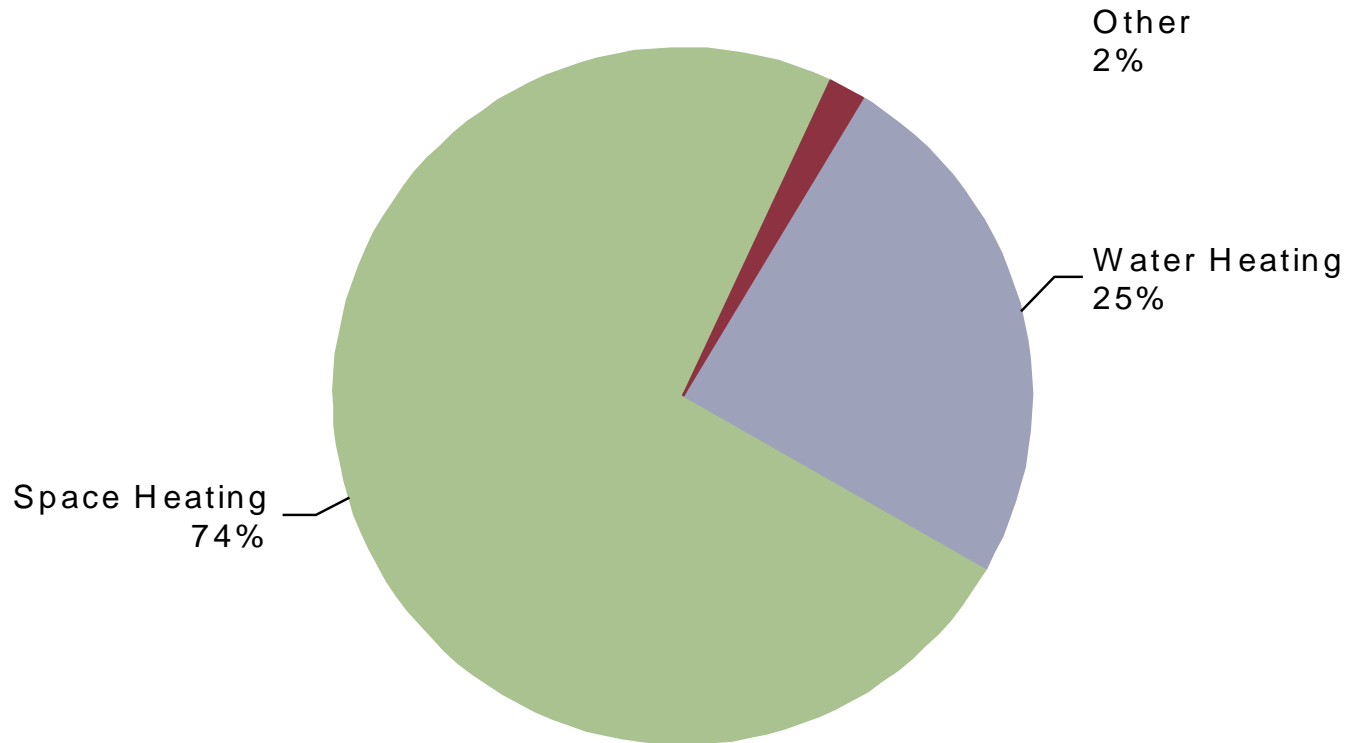


Commercial Natural Gas Economic Potential by Segment



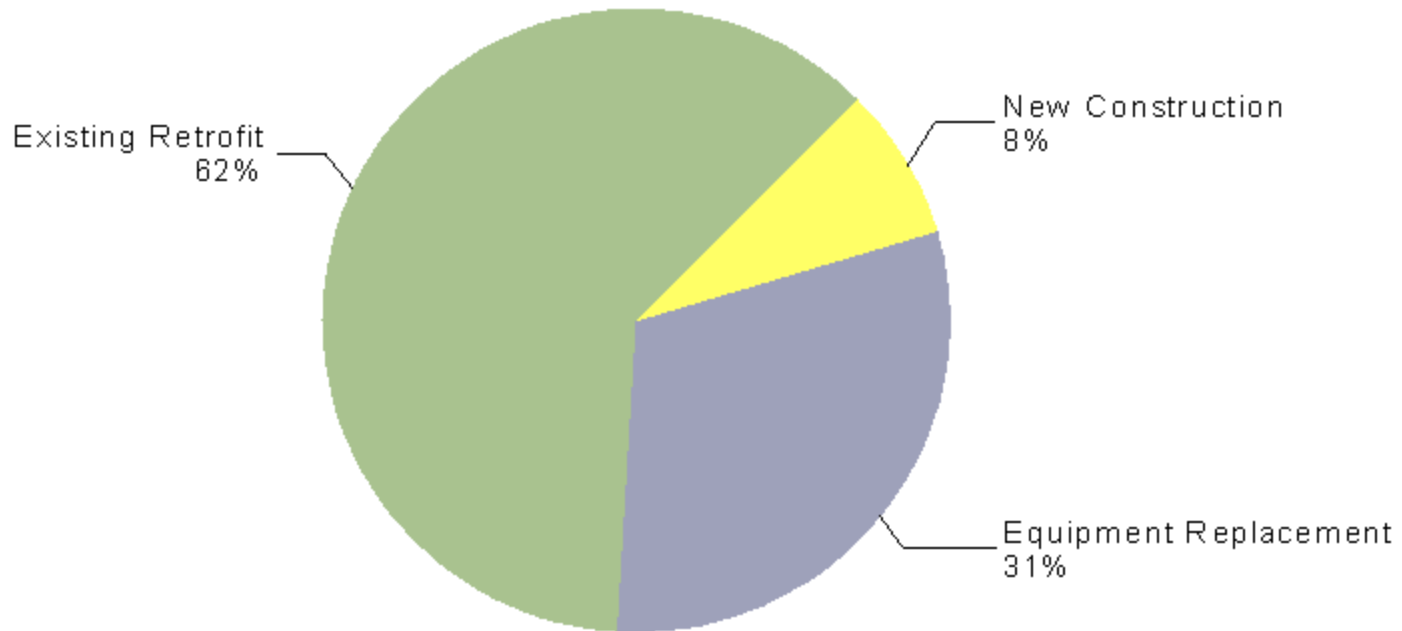
Note: "Other" includes:
Restaurant: 4%, Lodging: 2%, Large_Office: 2%, Small_Office: 2%, Grocery: <1%

Commercial Natural Gas Economic Potential by End Use

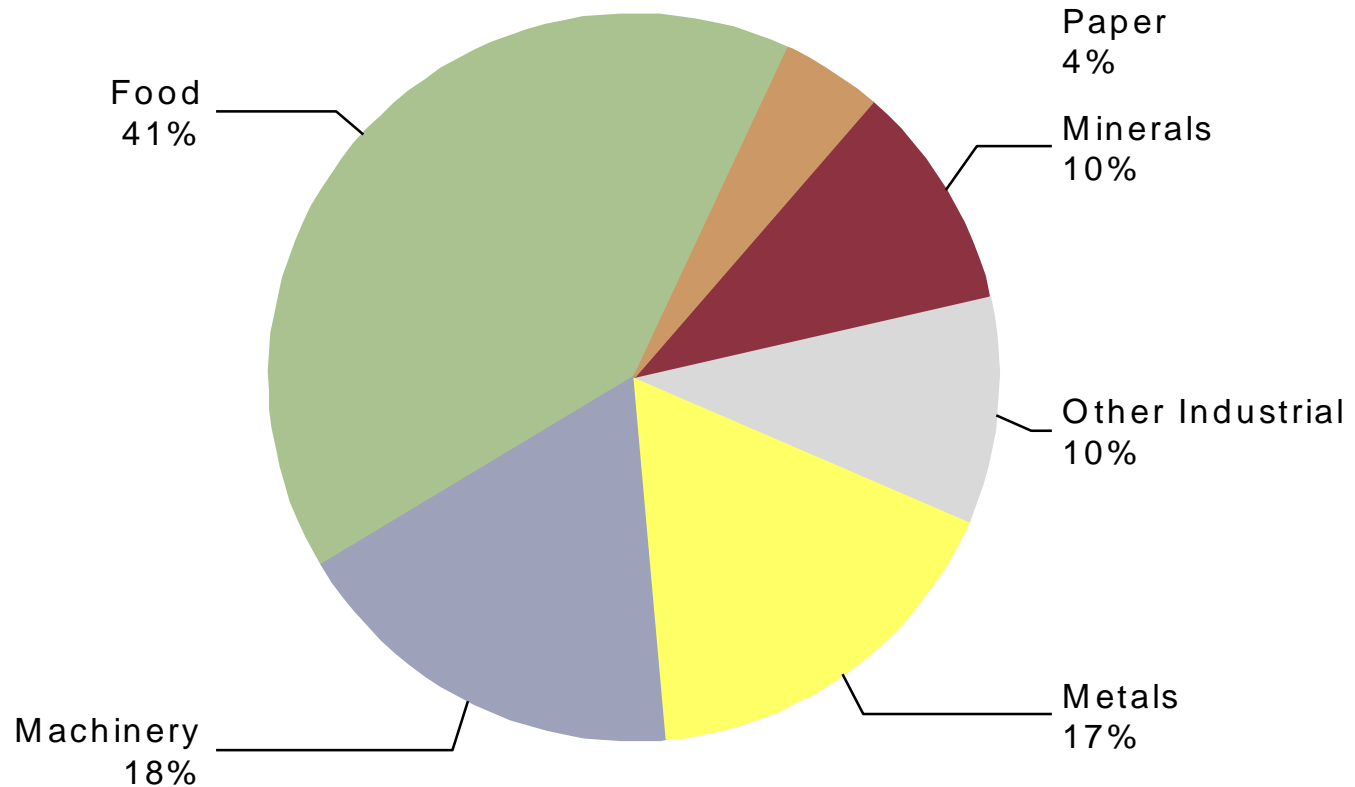


Note: "Other" includes:
Cooking: 1%, Pool Heating: <1%

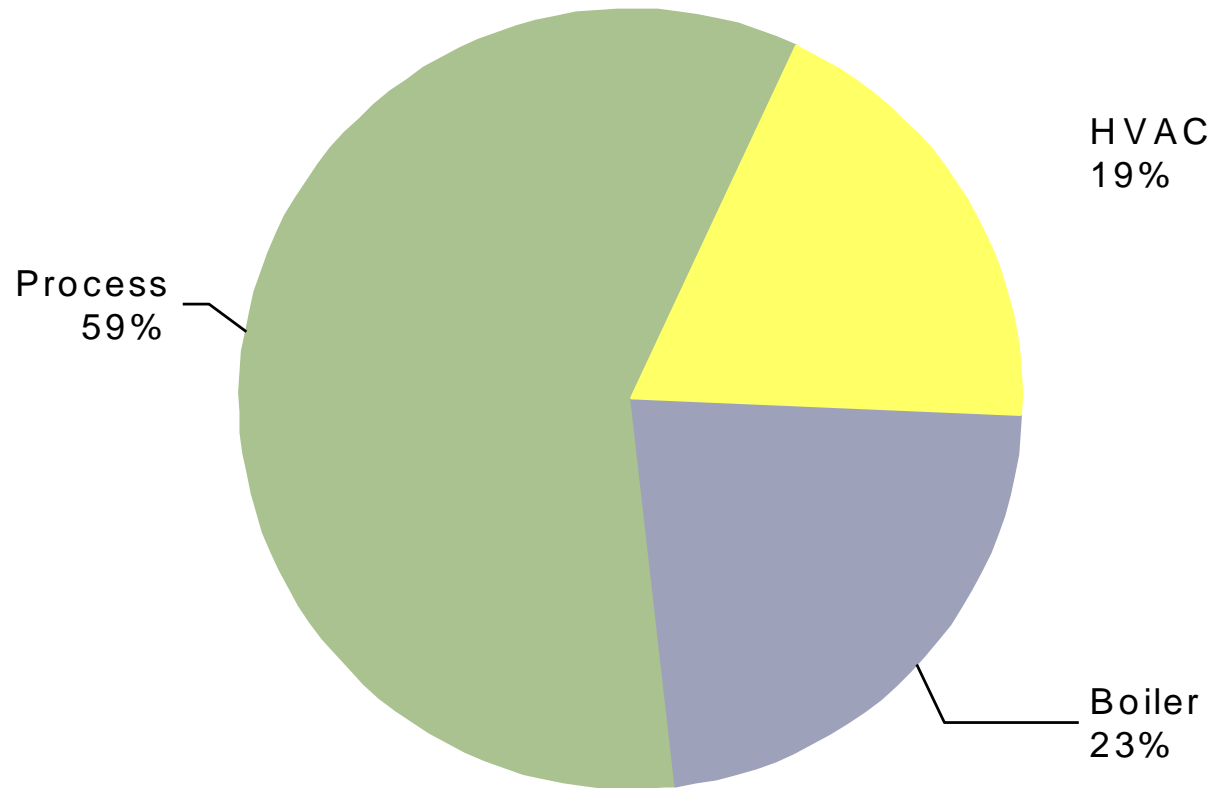
Commercial Natural Gas Economic Potential by Vintage and Measure Type



Industrial Natural Gas Economic Potential by Segment



Industrial Natural Gas Economic Potential by End Use



Economic Potential Scenarios

Avoided Cost Scenarios

- Three scenarios around avoided costs analyzed:
 - **Back to the Future (base case):** Relatively quick economic recovery. Carbon taxes and other factors lead avoided costs.
 - **Depression 2.0:** Slow economic recovery over 5 years. Less aggressive carbon legislation and other factors lead to 43% lower avoided costs.
 - **Grid.Com:** Relatively quick economic recovery. Rapid technological innovation and cost reduction in distributed technologies leads a decrease in power demand. Lowering avoided costs by 21% compared with the base case.

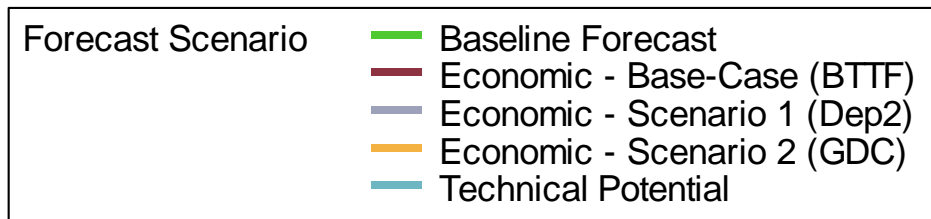
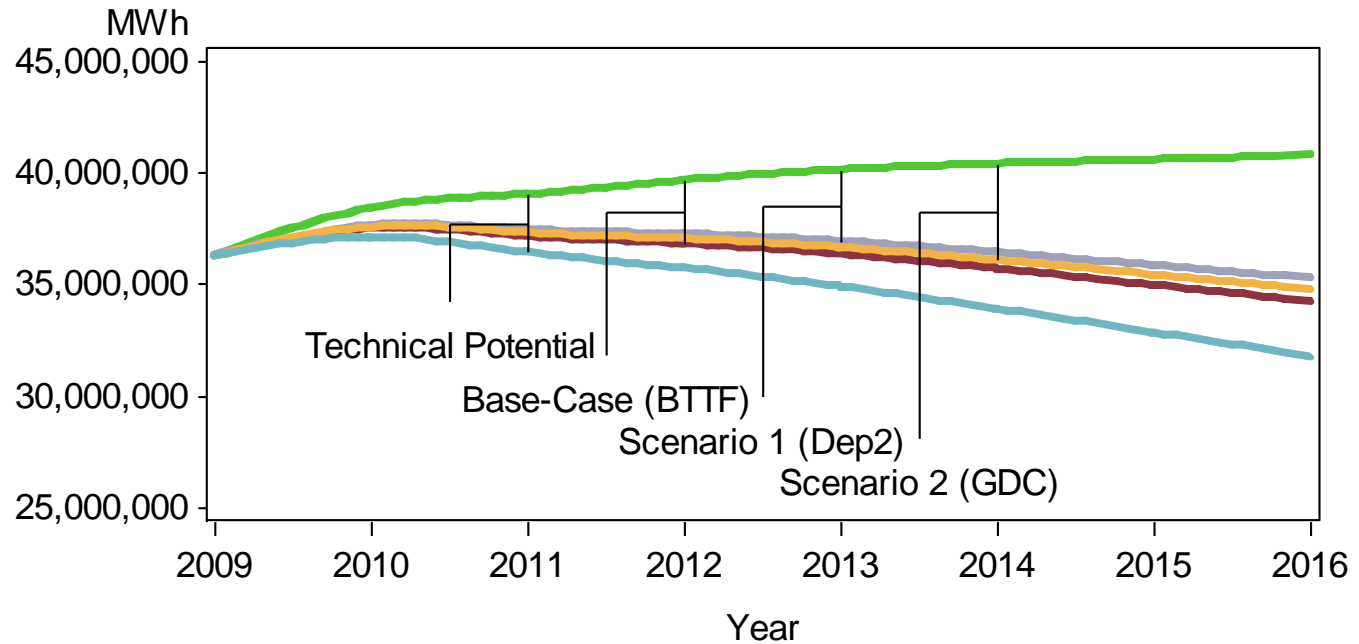
Electric Economic Potential by Scenario and Sector

Sector	Baseline Sales (MWh)	Economic Potential Scenarios					
		Back to the Future		Depression 2.0		Grid.Com	
		MWh	% of Baseline	MWh	% of Baseline	MWh	% of Baseline
Residential	12,005,689	2,526,901	21%	1,971,251	16%	2,269,417	19%
Commercial	14,746,277	2,419,946	16%	2,157,378	15%	2,338,712	16%
Industrial	14,030,164	1,591,086	11%	1,388,354	10%	1,392,200	10%
Total	40,782,130	6,537,934	16%	5,516,983	14%	6,000,329	15%

Natural Gas Economic Potential by Scenario and Sector

	Baseline Sales (therms)	Economic Potential Scenarios					
		Back to the Future		Depression 2.0		Grid.Com	
Sector		therms	% of Baseline	therms	% of Baseline	therms	% of Baseline
Residential	567,406,647	156,981,438	28%	108,095,450	19%	154,301,077	27%
Commercial	270,157,950	40,299,061	15%	28,439,689	11%	39,228,379	15%
Industrial	732,369,238	84,866,123	12%	74,257,858	10%	74,257,858	10%
Total	1,569,933,835	282,146,622	18%	210,792,997	13%	267,787,314	17%

Electric Sales Forecasts under Alternate Scenarios



Natural Gas Sales Forecasts under Alternate Scenarios

