Raising the Bar: At What Cost? A Twenty State Review of Savings and Spending on Energy Efficiency Programs Versus Potential

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ENERGY EFFICIENCY SAVINGS & SPENDING – HOW ARE WE DOING?

Two part presentation:

Part I: <u>2015 / 2016: Benchmarking Update:</u>

A 20 utility review of EE savings and spending as a percent of electric sales and electric revenue.

Part II: <u>Targets/ Potential Forecasts/ Results</u>.

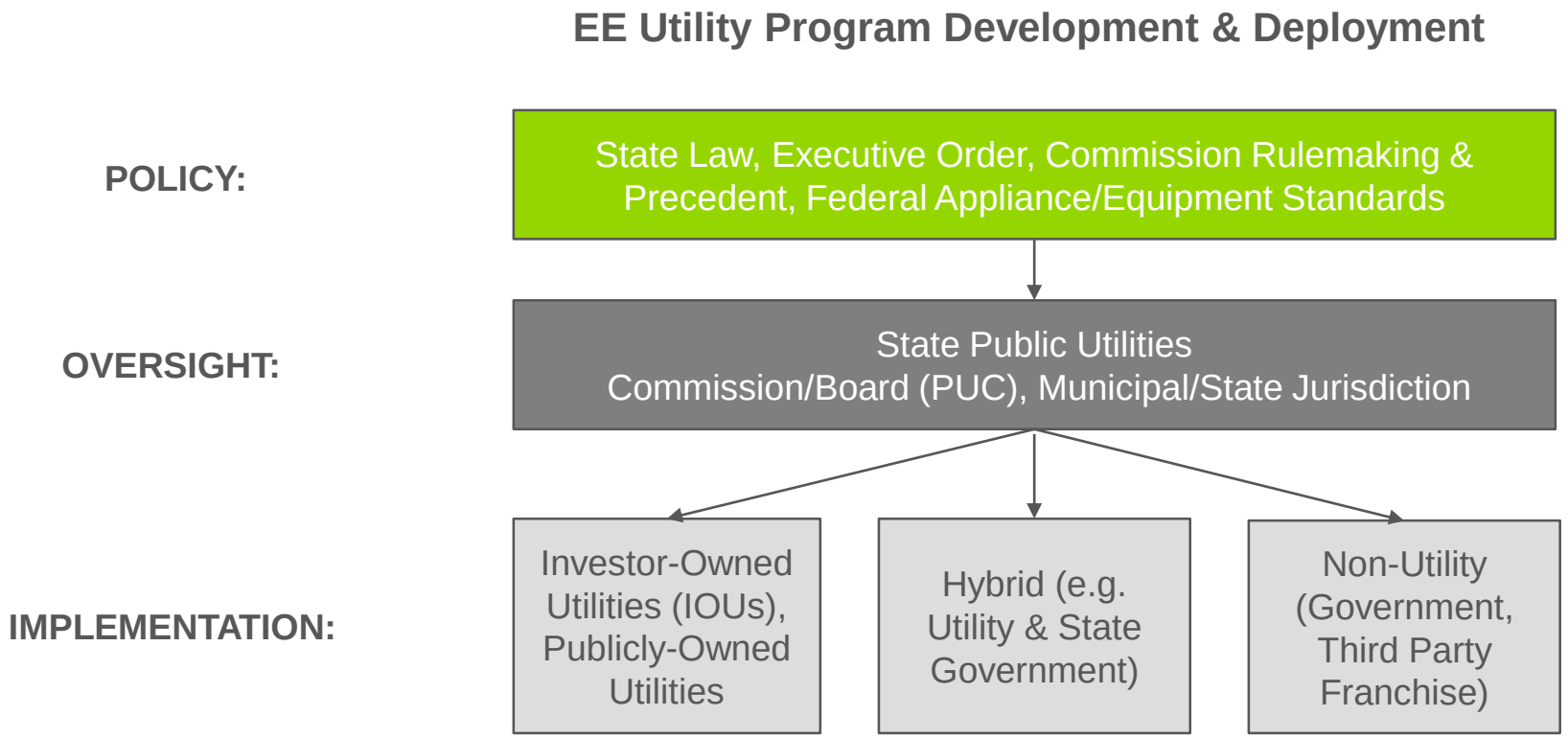
A comparative review of 15 utilities:

- Energy efficiency savings
- Energy efficiency resource standards
- Achievable potential

CONTEXT

ENERGY EFFICIENCY ROLES AND RESPONSIBILITIES

Investor-owned and publicly-owned utilities are the major channels for acquiring energy efficiency. Policies, rules, and interpretations impact results.



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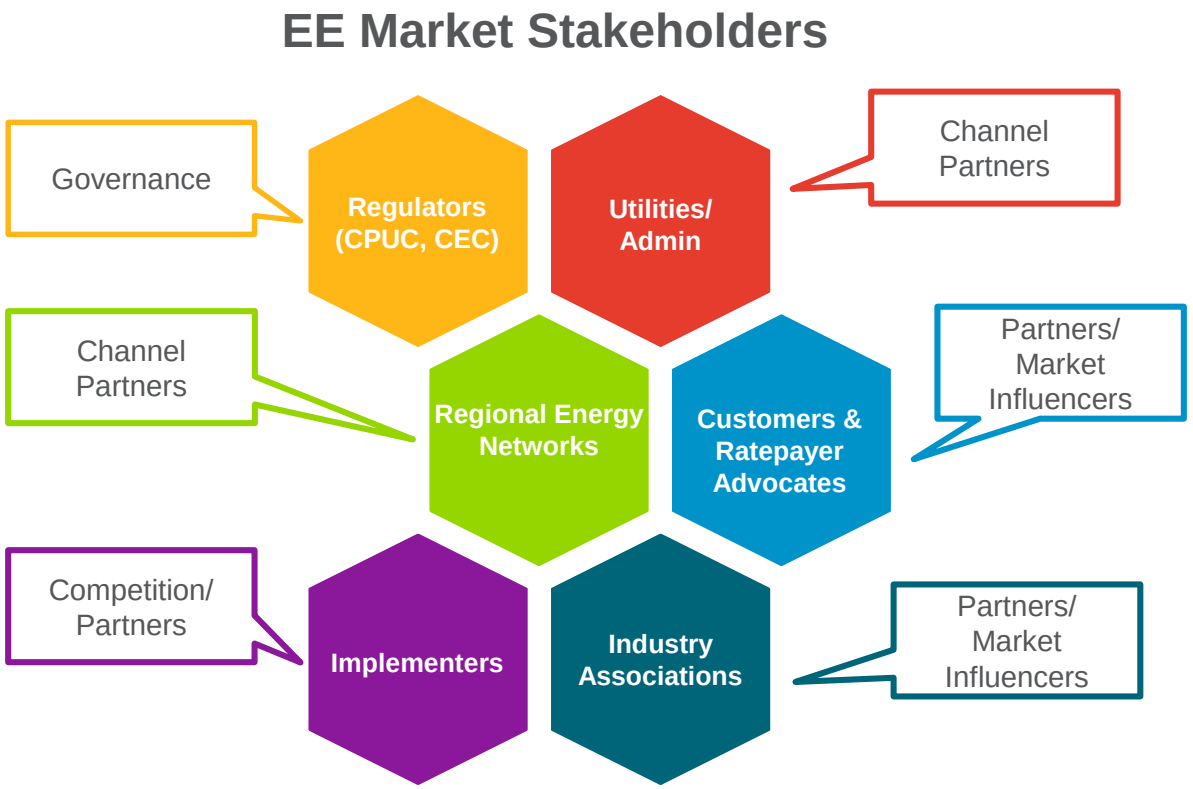
ENERGY EFFICIENCY MARKET ECOSYSTEM

Some states have aggressively pursued energy efficiency over a number of years developing a mature and dynamic markets.

- In states in the northeast and on west coast there are well-established market players and a rapidly evolving startup landscape.
- The market is defined by decisions from governance authorities and activity between potential competitors and partners, and influential stakeholders.



PART 1:

PORTFOLIO BENCHMARKING RESULTS

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SOURCES & APPROACH

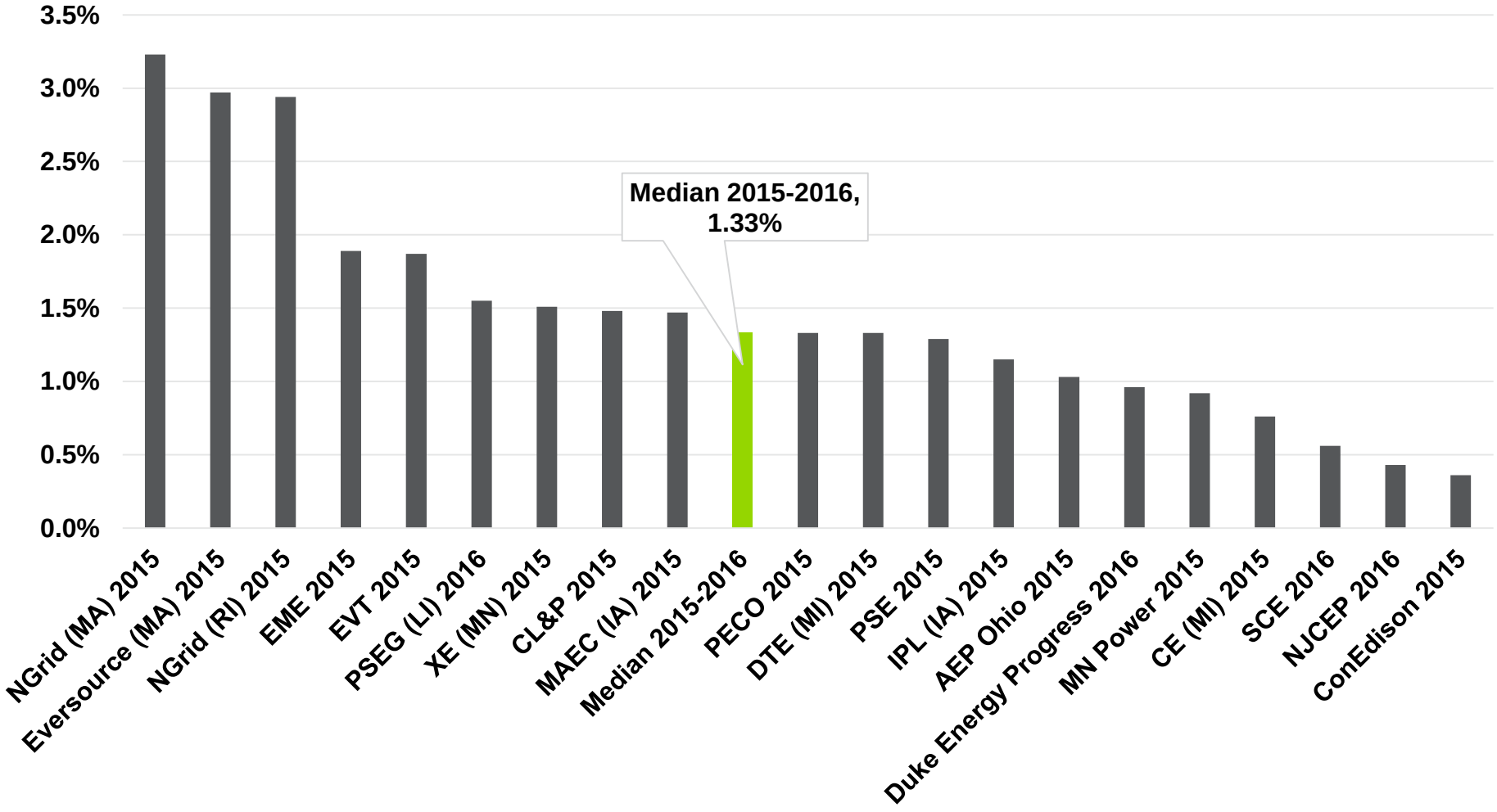
Benchmarking Research	
Objective	Benchmarking utility, sector and program-level DSM spending and savings statistics for select 2015-2016 portfolios.
Sample	Twenty-one peer utilities
Approach	1. Collected the following data points for each utility at the portfolio, sector, and program-level for 2015 and 2016: • Utility sales and revenue • Sector and program level spending and savings 2. Calculated the following for a normalized comparison: • Energy savings as percent of sales • First-year cost of savings

METHODOLOGY

BENCHMARKED UTILITIES FOR 2015-2016

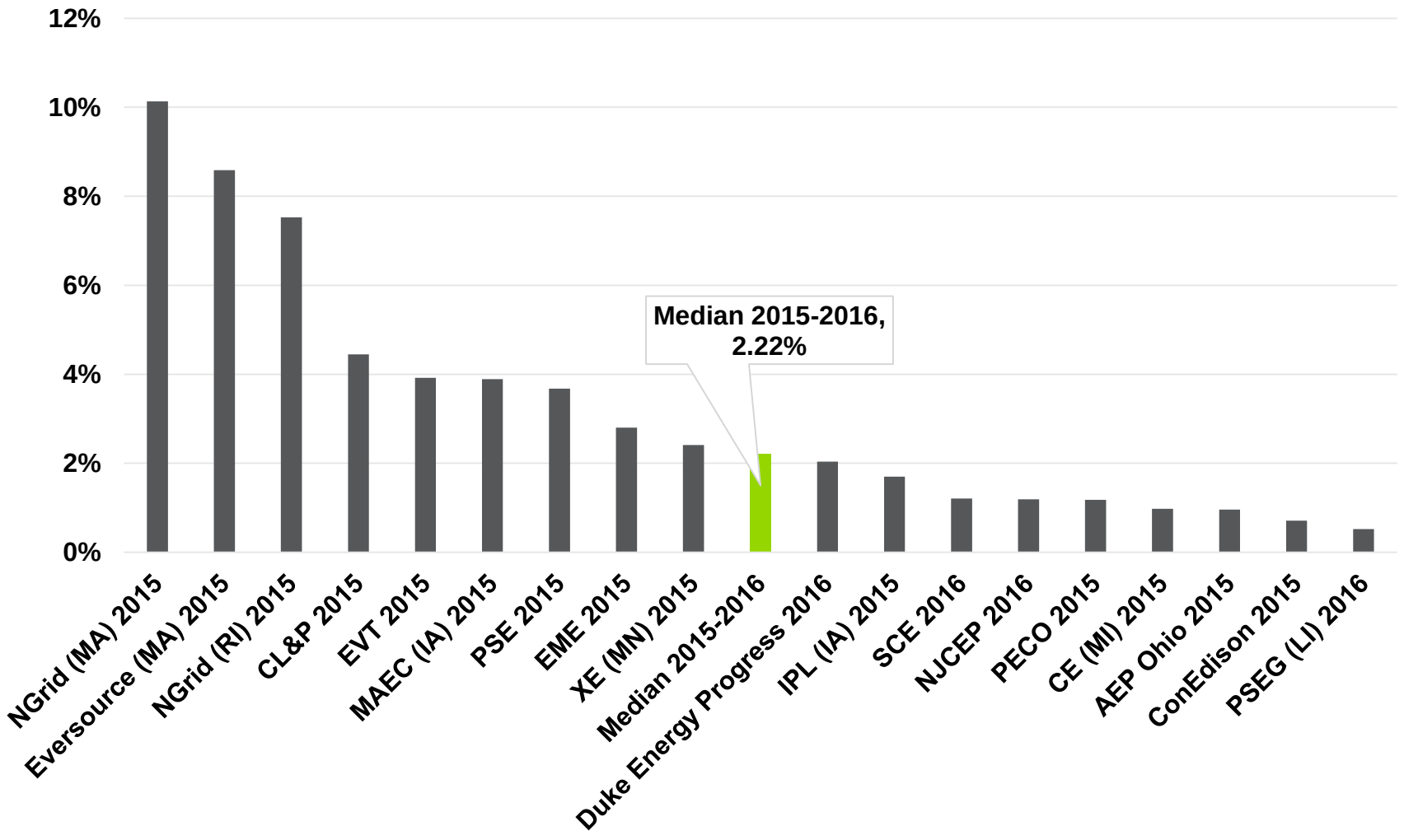
Utility	State	Program Type	Electric
AEP Ohio	OH	Younger	X
ConEdison	NY	Mature	X
Connecticut Light & Power	CT	Mature	X
Consumers Energy	MI	Younger	X
DTE Energy	MI	Younger	X
Duke Energy Progress	NC	Mature	X
Efficiency Maine	ME	Mature	X
Efficiency Vermont	VT	Mature	X
Eversource Energy	MA	Mature	X
Interstate Power & Light	IA	Mature	X
MidAmerican Energy	IA	Mature	X
MN Power	MN	Mature	X
National Grid	MA	Mature	X
National Grid	RI	Mature	X
NJCEP	NJ	Mature	X
PECO	PA	Younger	X
PSEG - LI	LI	Younger	X
PSEG - NJ	NJ	Younger	X
Puget Sound Energy	WA	Mature	X
Southern California Edison	CA	Mature	X
Xcel Energy	MN	Mature	X

INCREMENTAL ANNUAL ELECTRIC SAVINGS AS A PERCENT OF RETAIL SALES



BENCHMARKING RESULTS

ANNUAL ELECTRIC SPENDING AS A PERCENT OF REVENUE



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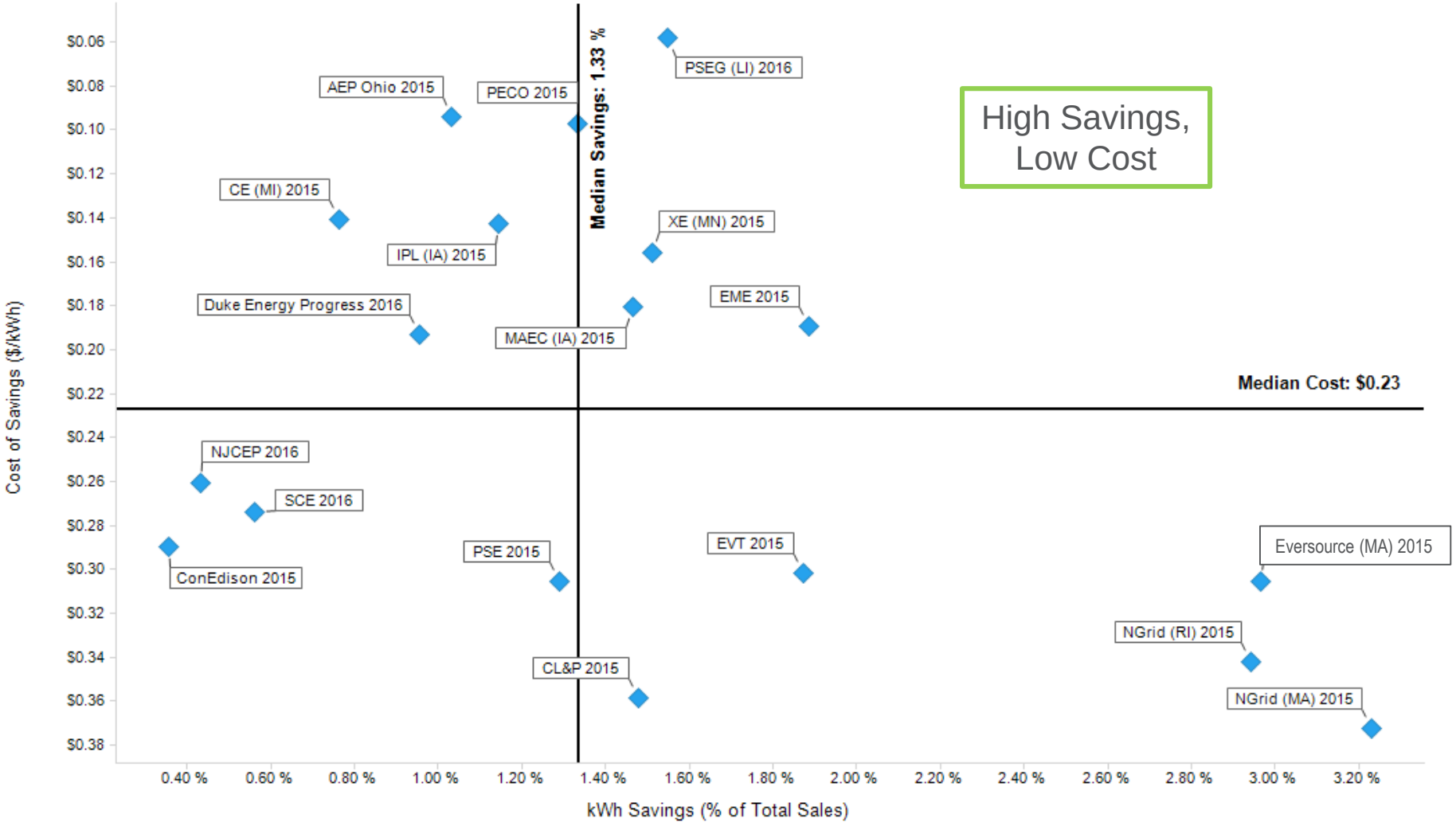
PORTFOLIO SUMMARY RESULTS

Electric 2015-2016 Results

Overall	Spending as % of Revenue	Energy Savings as % of Sales	Peak Demand Savings as % of Peak Demand	Retail Cost of Energy $/kWh	Cost of First year Savings	
					$/kWh	$/kW
All Utilities Median (2015 and 2016)	2.22%	1.33%	0.22%	$0.11	$0.23	$699.88

Note: Savings are gross, verified, and at the meter.
Note 2: 2015 baseline data (retail kWh/MCF sales and revenue) was used to normalize 2015 savings data and 2016 baseline data was used to normalized 2016 savings data.

2015 / 2016 PORTFOLIO ELECTRIC RESULTS (FIRST YEAR UTILITY COSTS AND SAVINGS)



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PART 2:

SAVINGS VS.

POTENTIAL VS.

ENERGY EFFICIENCY RESOURCE STANDARDS

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RESEARCH QUESTION

ACTUAL SAVINGS VS. POTENTIAL VS. ENERGY STANDARD

Research Objective: How do estimates of energy efficiency achievable potential compare, in both cost and savings, to actual achievement, and the state energy efficiency resource standards?

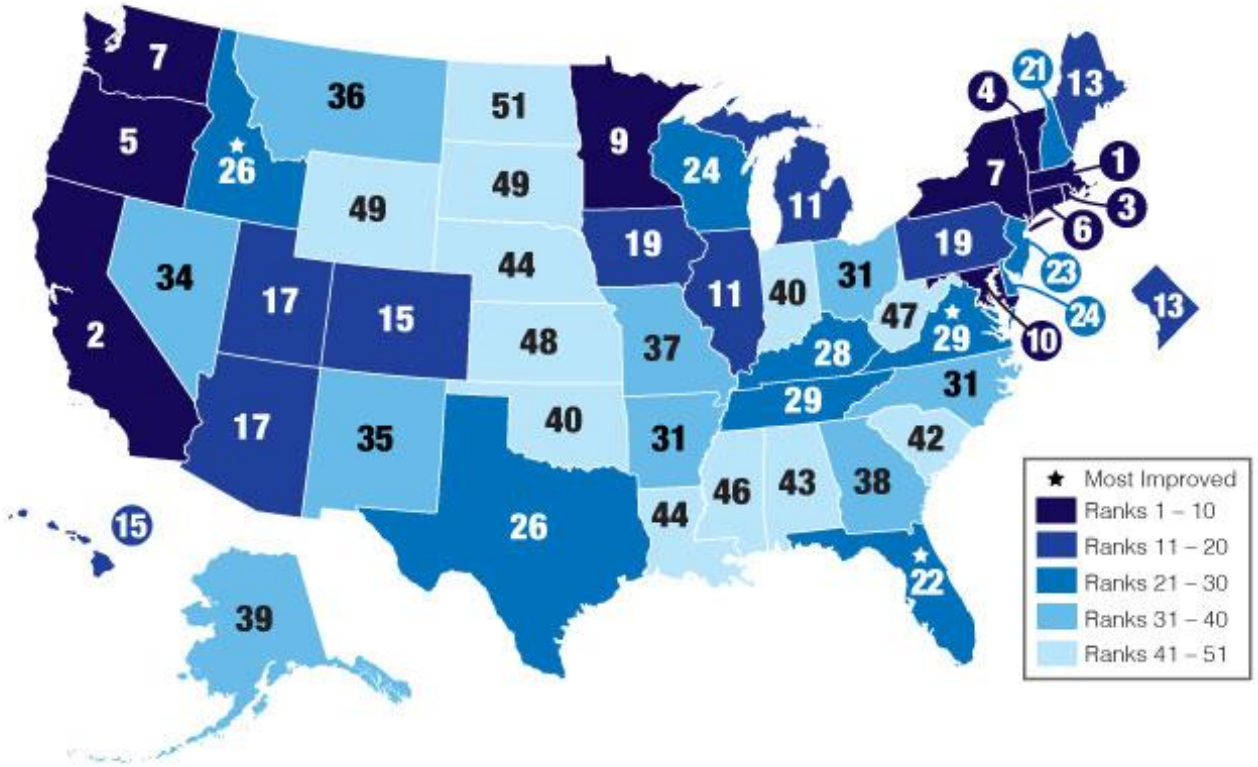
- **Approach:** Navigant reviewed the performance of 15 utility energy efficiency portfolios to recently published potential study forecasts, projected for the 2014-2015 period.

- **Why:** Assess the inter-relationship between results, targets, and potential estimates….and consider what are key driving forces.

ACEEE: STATE ENERGY EFFICIENCY SCORE CARD

The Northeast and West Coast tend to be the leaders in aggressive and comprehensive EE.

ACEEE 2017 State Energy Efficiency Scorecard



Source: American Council for an Energy Efficient Economy, 2017 State Scorecard

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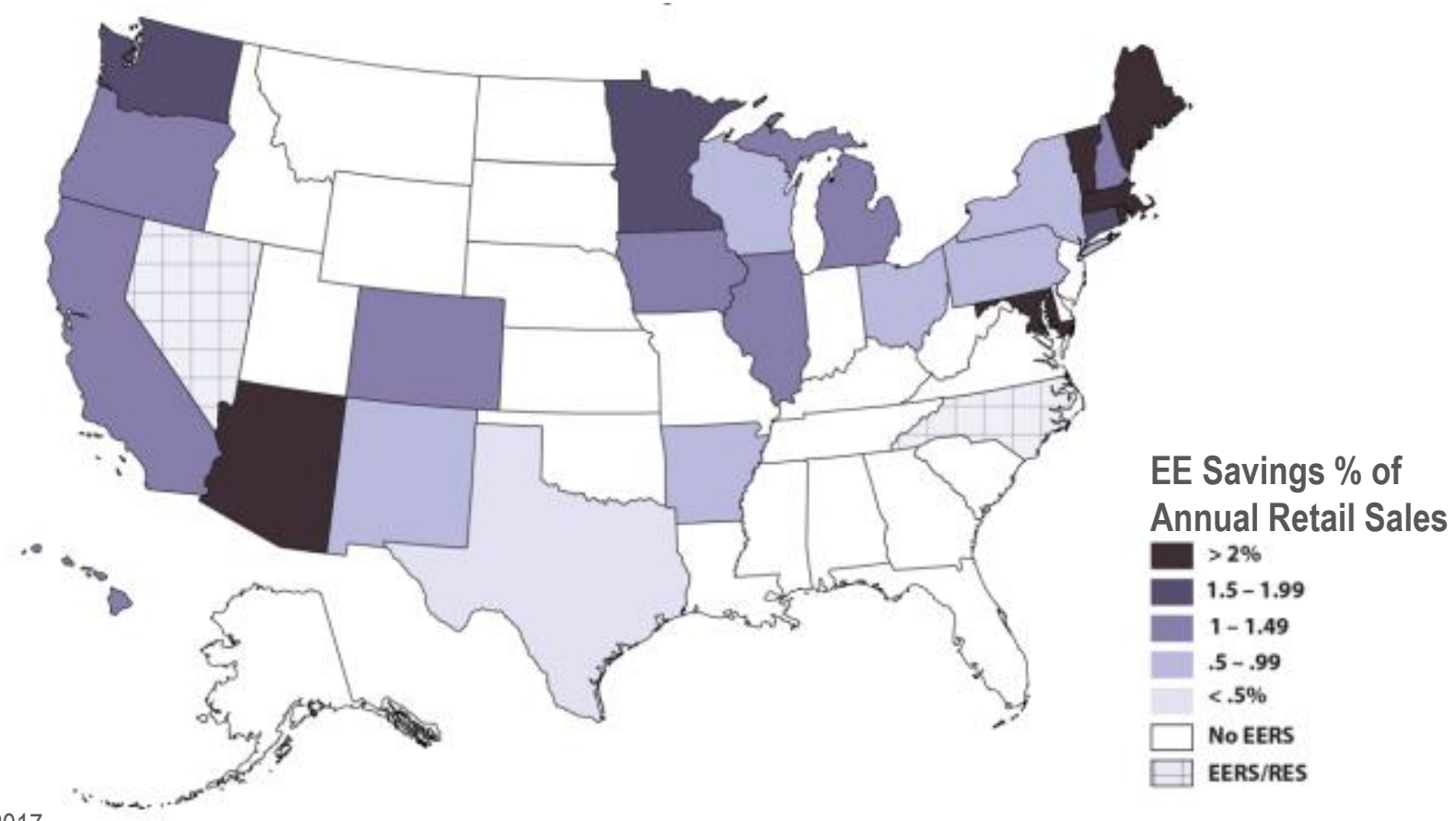
NATIONAL ENERGY EFFICIENCY RESOURCE (EER) TARGETS

Similarly, these regions tend to have the highest EERS goals.



Source: ACEEE, 2017

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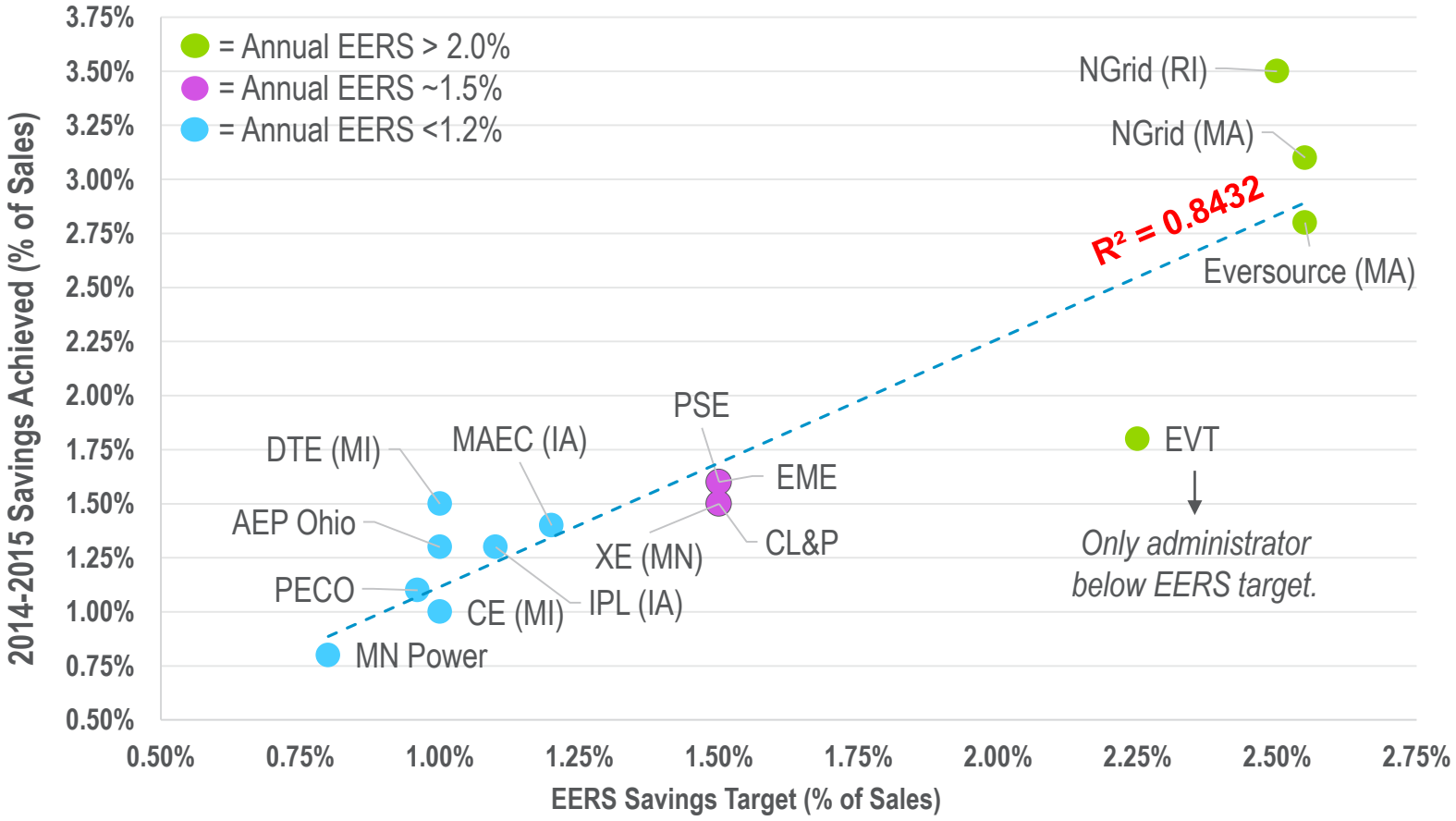
EERS TARGET VS. 2014-2015 SAVINGS ACHIEVEMENT

Resource acquisition is well correlated with EERS targets (Sample R2 = 0.84).



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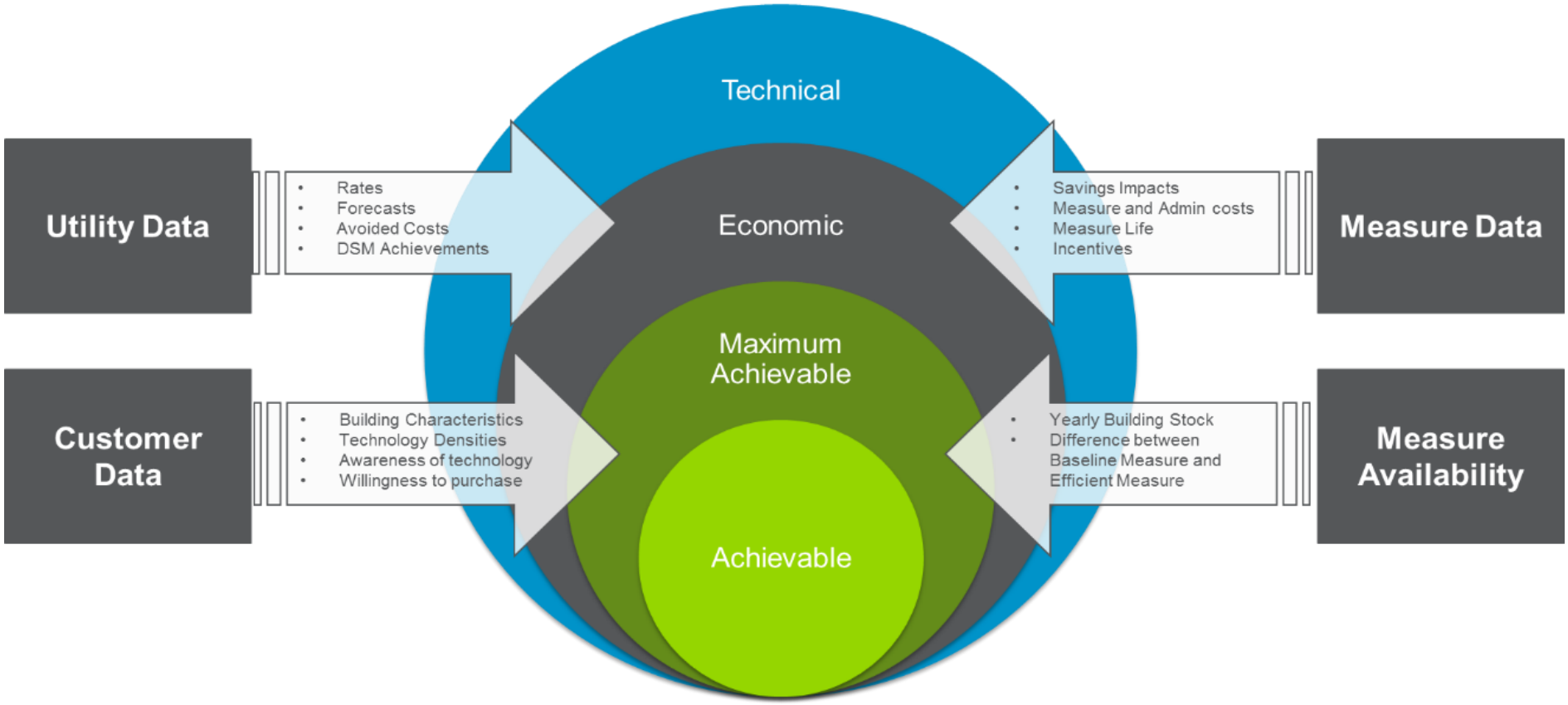
FOUR LEVELS OF ENERGY EFFICIENCY POTENTIAL



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HIDDEN …BUT INFLUENTIAL FACTORS IN “ACHIEVABLE” POTENTIAL STUDIES

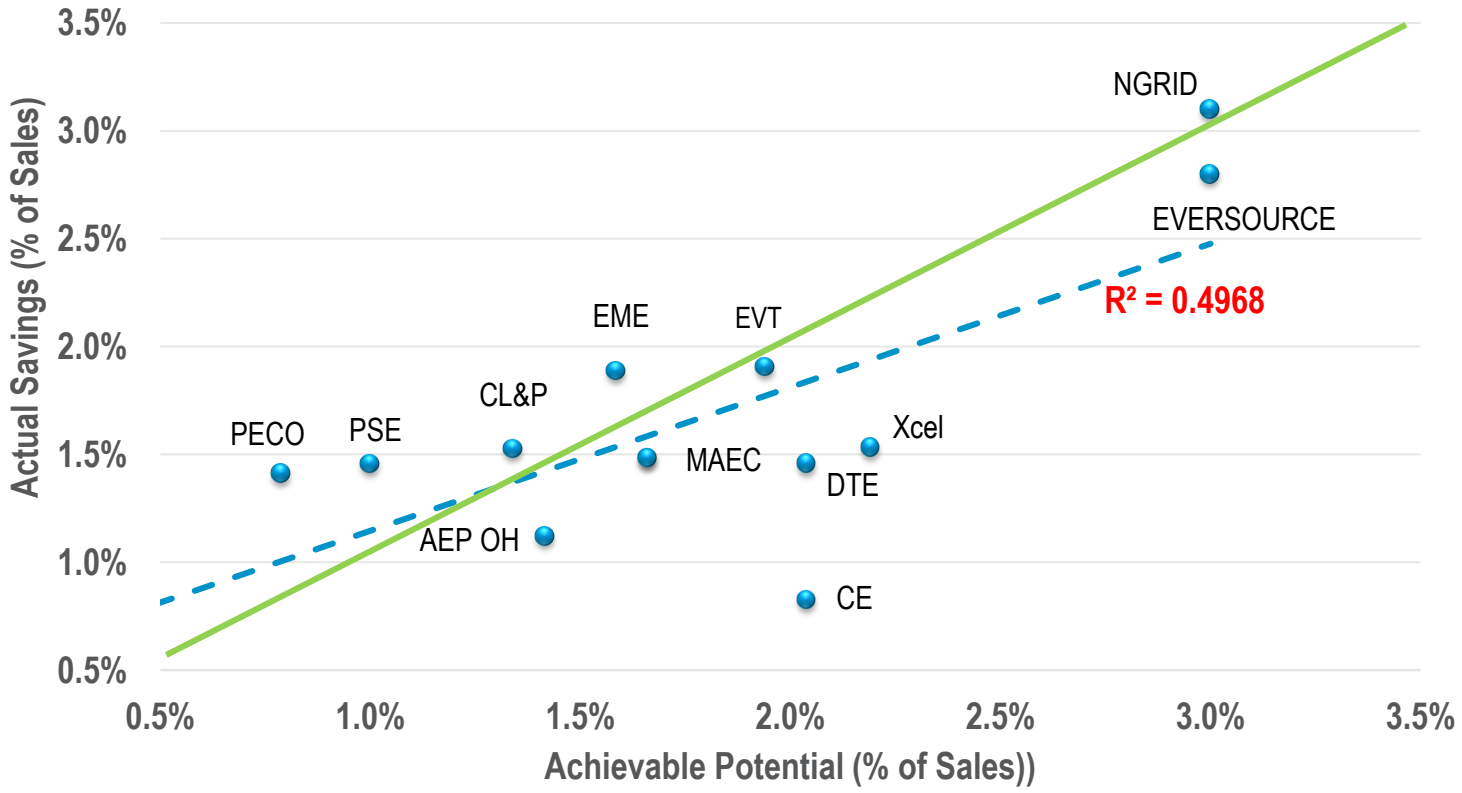
- What are you defining as “achievable”?

- Budget constrained or not? …(e.g. DSM spending limited to 2% of revenue?)

- State specific benefit-cost criteria such as:
  - Cost-effective at the total resource cost test, or utility cost test?
  - Cost-effective at net or gross savings?
  - Avoided cost calculation methodologies?
  - Allowance of multipliers for non-energy benefits?
  - Integrity of the measure level savings estimates and accuracy of forecasted delivery costs?

ACHIEVABLE POTENTIAL VS. SAVINGS ACHIEVEMENT

Utilities in our sample saved 84% of their achievable potential savings in 2014-2015 overall, though there is a relatively weak correlation between achievable potential forecasts and actual savings for individual utilities (R^2 = 0.50).



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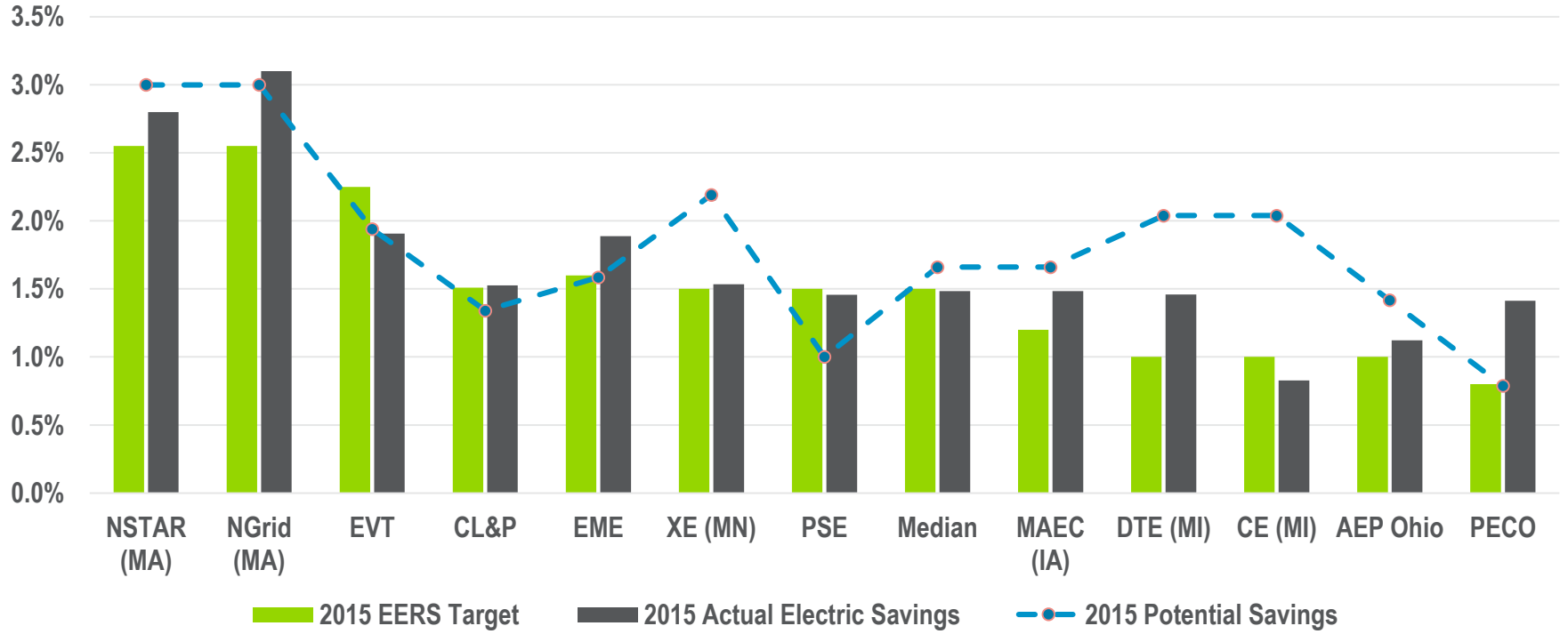
SAVINGS ACHIEVEMENT VS. ACHIEVABLE POTENTIAL

Most utilities' savings were driven largely by EERS targets, regardless of published potential, though in many cases potential studies formed the basis for EERS targets.



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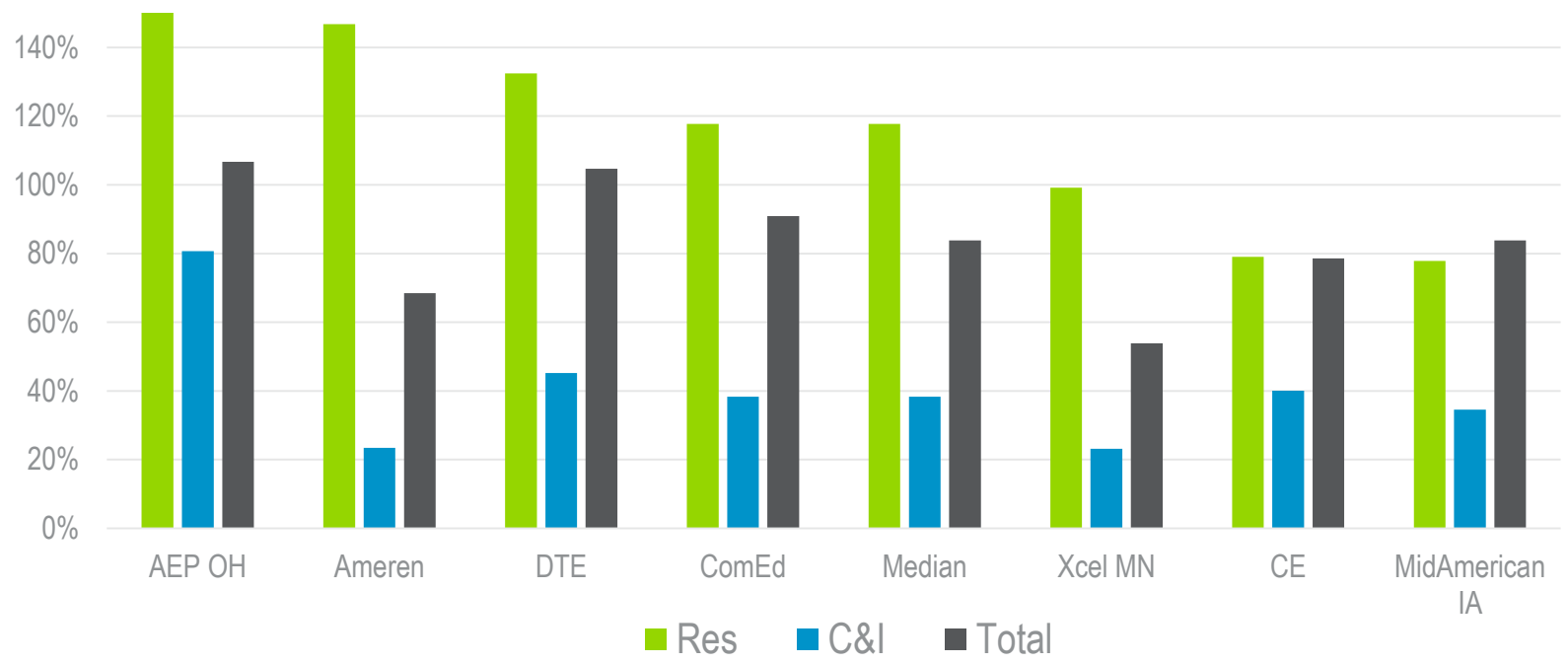
2015 SAVINGS ACHIEVEMENT VS. ACHIEVABLE POTENTIAL

Utilities exceeded their 2015 residential achievable potential forecasts on average (115%) , but achieved only 41% of C&I potential.



- **Achievable Res. Sector Potential:** Forecast 35% savings from res. lighting, average actual was 50% from res. lighting, and three utilities achieving 75% of res. sector savings from lighting.

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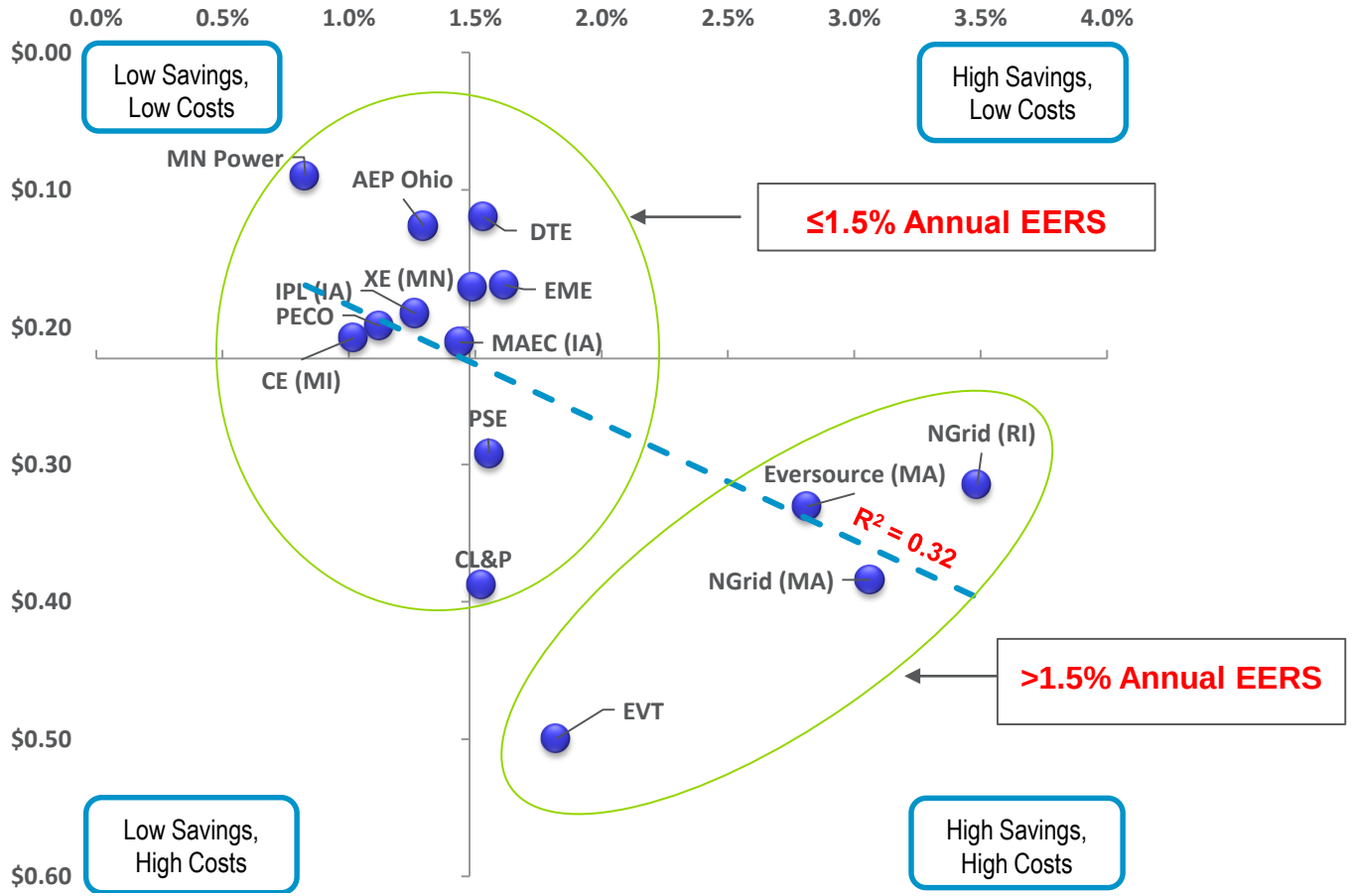
SAVINGS ACHIEVEMENT VS. COST OF SAVED ENERGY (CSE)

The average EERS goal in 2015 among our utility sample was 1.5%. An increase in achieved savings does not alone explain an increase in CSE.



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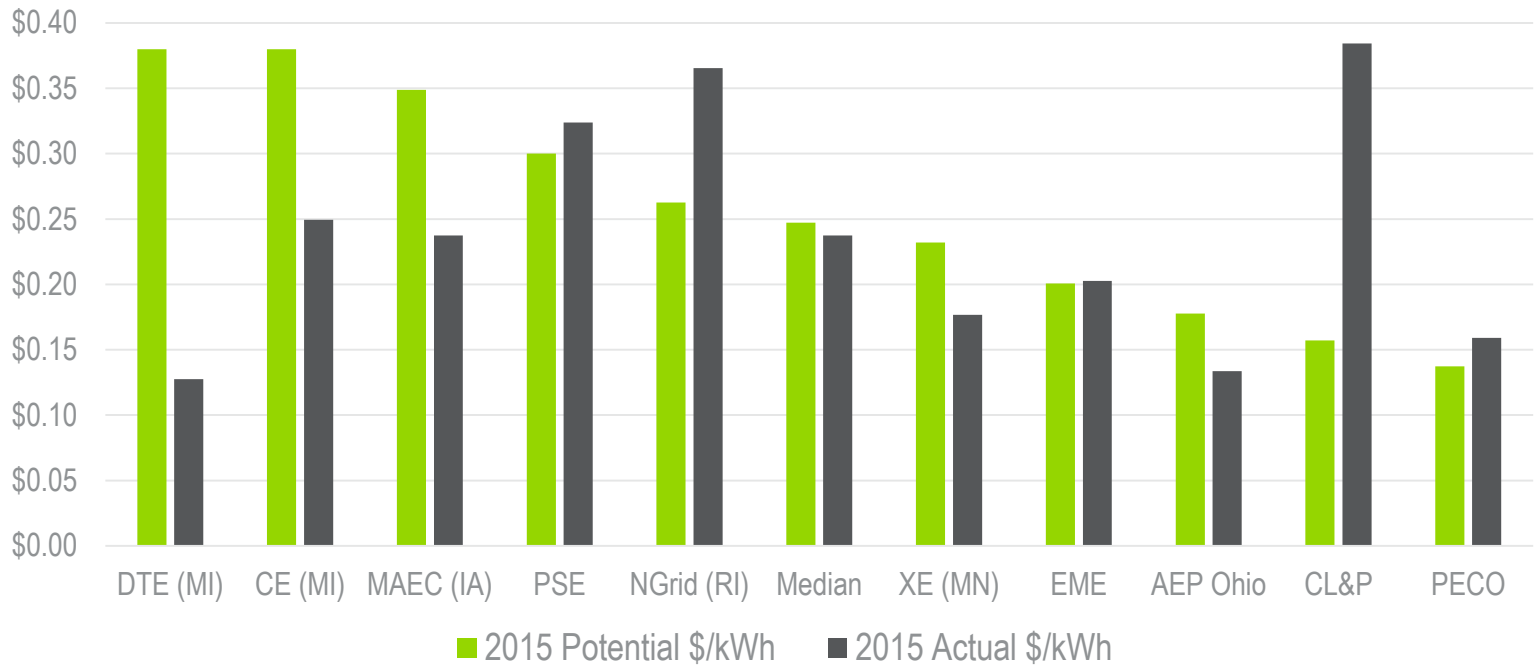
FORECAST FIRST YEAR COST /KWH VS. ACTUAL

The median portfolio cost of savings in 2015 ($0.24/kWh) corresponded to the median potential study forecast for 2015 ($0.25/kWh) though individual utilities varied widely.



Admin Costs: Median admin cost $0.07/kwh, min ($0.04 (Maine), max ($0.23/ (VT)

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FINDINGS ON COST & KEY DRIVERS OF PERFORMANCE

Administrative spending is not correlated to total savings obtainment

- Total acquisition costs scale up according to savings targets though administrative costs do not scale proportionately.
- Lack of correlation found between administrative spending and energy savings
- Best-Practice utility interviews found that these utilities are:
  - More aggressive vendor contract negotiations
  - More actively managing and optimizing their portfolio spending through more sophisticated budget and project management tools and dashboards.
  - Shifting budget to “hot” markets in effort to do more with less.

CONCLUSION

WHAT'S NEXT FOR EE SAVINGS TARGETS AFTER 2020?

- Potential study results are highly variable to actual performance, except in states with all cost-effective EE targets.
- Cautious interpretation of portfolio results and potential studies is critical.
- Savings from residential lighting savings are expected to drop dramatically
- Portfolio designs will need to innovate and diversify to find new savings
- Energy efficiency resource standards will likely be revised and / or move to a process where utilities integrated resource plans become a more significant factor in setting efficiency targets.
- More research is needed now…to forecast and potentially re-calibrate EERs for post-2020.
- What will be the new "high bar" savings targets post 2020?

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