
Financial Analysis of Incentive Approaches to Promote Energy Efficiency for a Prototypical Southwest Utility

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Project Approach & Objectives

- **Background**: Current environment is one of substantially increased interest in energy efficiency and demand response
 - Policymakers want and are proposing very aggressive demand-side savings goals in many parts of the country
 - Policymakers want to increase utilities' motivation to achieve these goals
- **Goal**: Facilitate dialogue on various utility shareholder incentive mechanisms and/or decoupling when EE is implemented by conducting quantitative financial analysis
- **Approach**: Analyze impacts of various utility performance incentives and ratemaking mechanisms on stakeholders (shareholders, ratepayers); calculate earnings, utility bill and rate impacts for prototypical utilities under different utility and incentive mechanism design scenarios

Project Approach & Objectives (2)

- **Caveats:**

- We do NOT account for any potential link between the type and/or size of shareholder incentive mechanism and utility's motivation to increase EE goals or portfolio size
- We do NOT analyze other potential non-financial motivators of utility behavior and support for EE (e.g., PUC orders, customer relations)

- **Project Team**

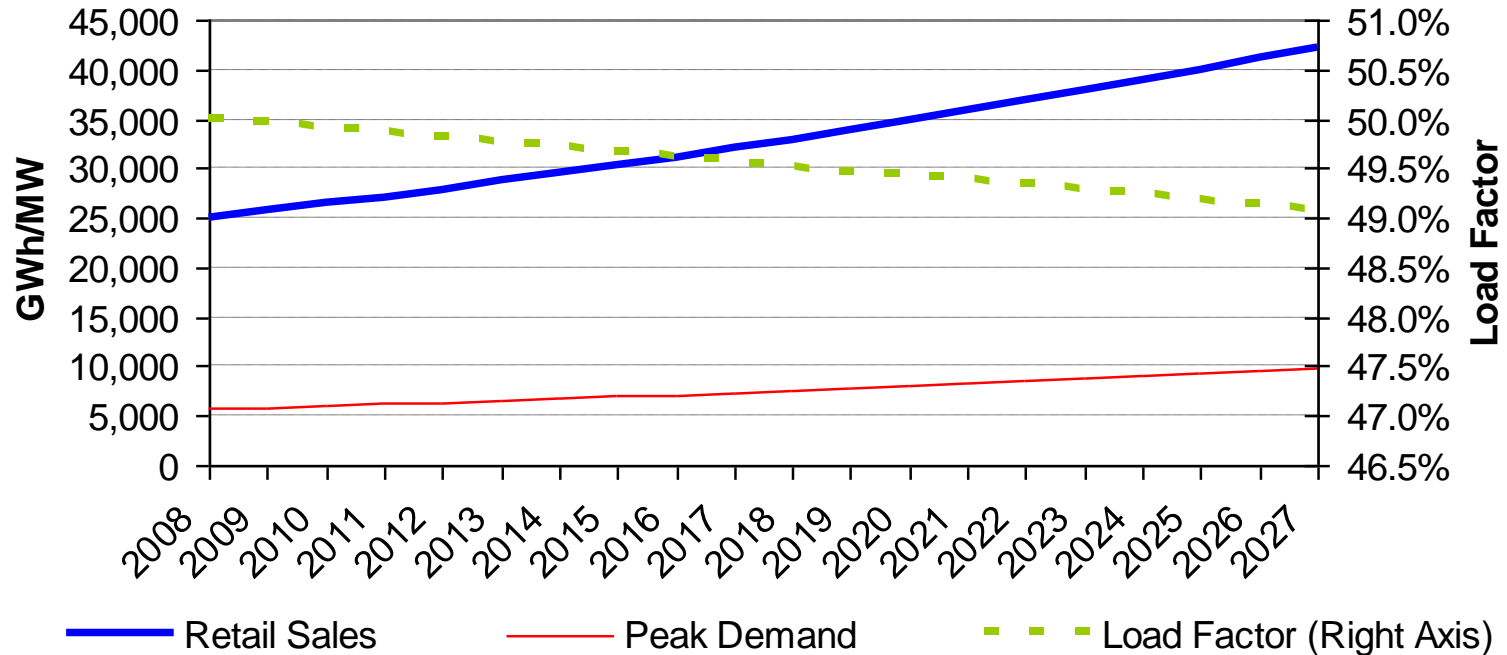
- Chuck Goldman & Peter Cappers (LBNL)
- Wayne Shirley (Regulatory Assistance Project)
- Michele Chait (E-Three)
- Jeff Schlegel (Consultant)
- George Edgar (Wisconsin Energy Conservation Corp.)



Developing Prototypical SW Utility

- Examined historical financial, cost and system characteristics of IOUs serving southwestern states
- Used characteristics of Arizona Public Service (APS) and Nevada Power (NP) to help develop our prototype SW utility
 - Also collected data on utility financial, system characteristics and DSM for Pacificorp, Public Service New Mexico (PSNM), Tucson Electric and Rocky Mountain Power
- Relied heavily upon publicly available data sources
 - Annual Financial Reports & 10-K filings
 - FERC Form 1
 - Integrated Resource Plan filings
 - Demand Side Management program filings
- Created “business as usual” No EE case for prototypical SW utility
 - EE cases with varying incentive mechanisms compared to this “BAU No EE” case

Prototypical SW Utility: Retail Sales and Demand Forecast



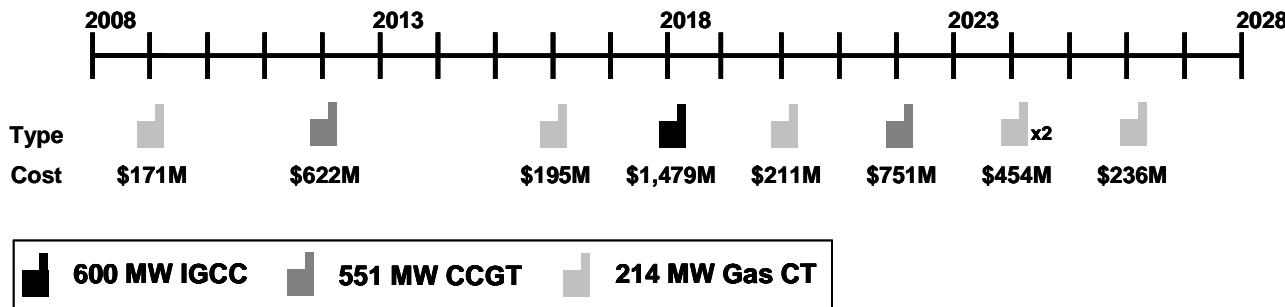
- **Retail sales grow @ 2.8% annually**
- **Peak demand grows @ 2.9% annually**
- **Declining load factor at this rapidly growing utility**



Prototypical SW Utility: Revenue Requirement and Retail Rates

Utility Budget Category	2008 Level (\$B)	2017 Level (\$B)	2027 Level (\$B)	Annual Growth Rate (%)
T&D Capital Expenditure	\$0.3	\$0.5	\$0.7	5.0%
Ratebase	\$4.3	\$6.7	\$11.1	5.1%
Operations and Maintenance	\$0.4	\$0.8	\$2.0	8.8%
Fuel & Purchased Power	\$1.2	\$2.3	\$4.2	6.7%
Annual Revenue Requirement	\$2.3	\$4.2	\$8.1	6.9%
<i>All-In Retail Rate</i>	<i>9.1 ¢/kWh</i>	<i>13.1 ¢/kWh</i>	<i>18.9 ¢/kWh</i>	<i>3.9%</i>

- Both fuel and non-fuel costs are growing faster than sales
- IRP sets out investment schedule for large new generation plant, that EE can help defer
- Retail rates double over 20-year time horizon



Savings and Costs of Alternative EE Portfolios

Energy Efficiency Portfolio	Target % Reduction in Incr. Retail Sales	Lifetime Impacts				
		Energy and Demand Savings			Program Costs	
		Peak Period Savings (GWh)	Off-Peak Period Savings (GWh)	Peak Demand Savings (MW)	Program Admin. Costs (¢/Lifetime kWh)	Total Resource Costs (¢/Lifetime kWh)
Moderate	0.5%/Year	10,452	4,479	226	1.6	2.6
Significant	1.0%/Year	19,433	8,328	421	1.8	3.0
Aggressive	2.0%/Year	34,314	14,706	743	2.7	4.0

- Assume utility delivers EE programs for 10 years
- Assume 11 year avg. measure lifetime of EE portfolio
- Assume Sig. and Agg. EE portfolios have higher costs than Mod. EE portfolio due to more expensive measures and higher customer incentives
- EE still costs considerably less than supply-side alternatives under consideration

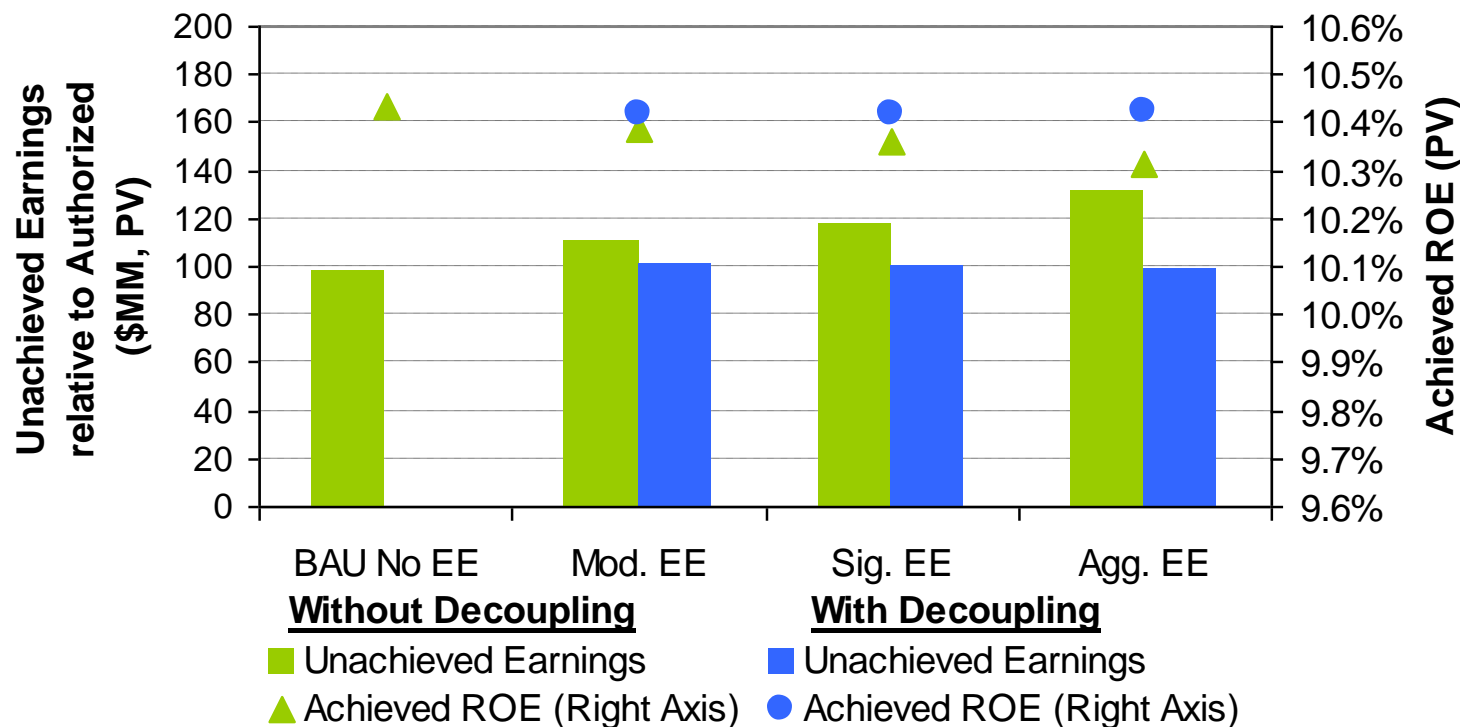


Conflict Between Shareholder and “Societal” Value of EE

Energy Efficiency Portfolio	Total Resource Benefits (\$B)	Total Resource Costs (\$B)	Net Resource Benefits (\$B)	Benefit Cost Ratio	Achieved After-Tax ROE
None	N/A	N/A	N/A	N/A	10.43%
Moderate	\$0.67	\$0.26	\$0.41	2.6	10.39%
Significant	\$1.22	\$0.55	\$0.67	2.2	10.36%
Aggressive	\$2.06	\$1.20	\$0.86	1.7	10.32%

- **Large-scale, sustained energy efficiency efforts produce significant net resource benefits; EE portfolios are very cost-effective**
- **However, the more aggressive the EE effort, the more such efforts will conflict with shareholders’ interest**
 - **Utility unable to achieve authorized earnings and ROE (10.75%) before EE is implemented as costs are growing faster than sales between rate cases**
 - ◆ Achieving deep and sustained EE savings exacerbates this problem
 - **EE defers need for future supply-side investments that generate earnings**
 - ◆ Replace them with EE investments that provide NO contribution to earnings

Effect of Decoupling on Utility Earnings and ROE

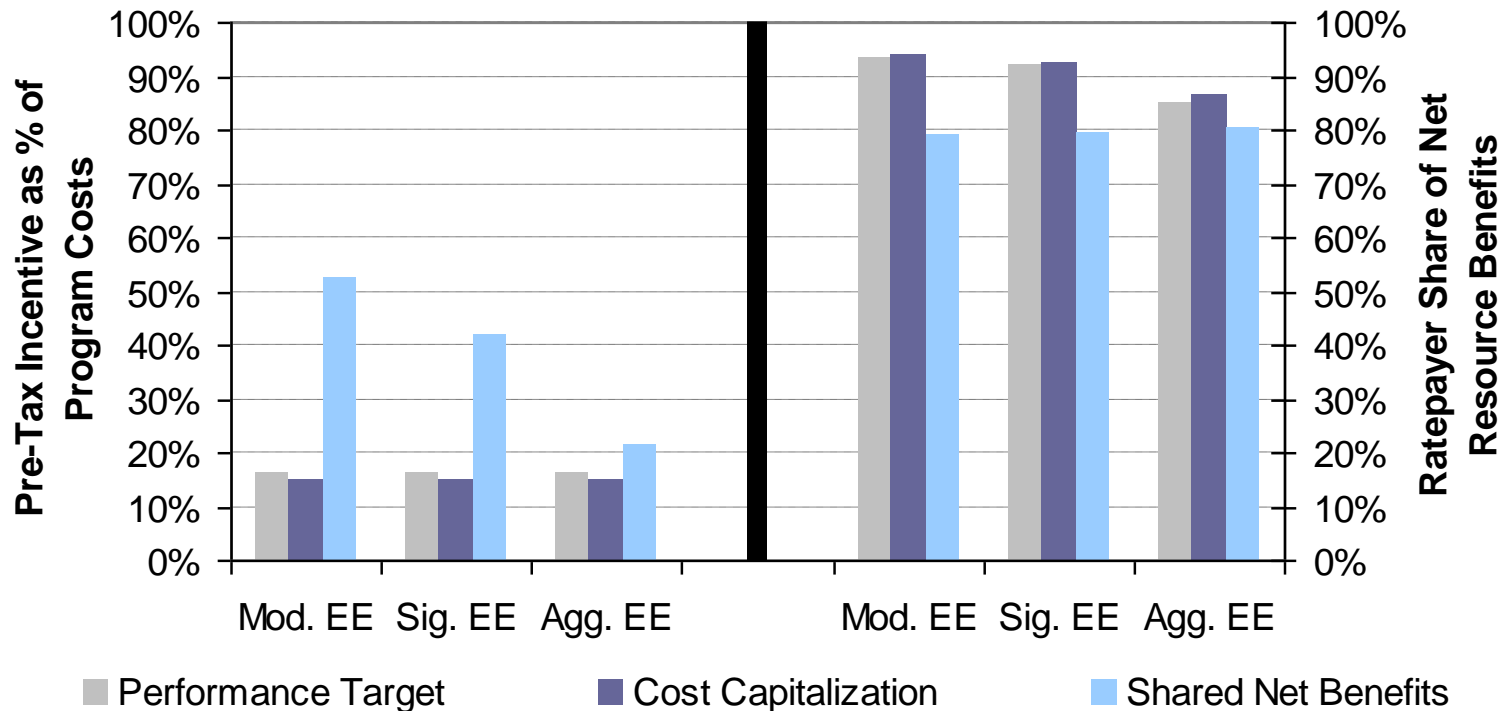


- Revenue-Per-Customer decoupling mechanism removes financial disincentive to EE as utility ROE is comparable to the BAU No EE case for any EE portfolio

Alternative Shareholder Incentives

- **Several shareholder incentive mechanisms are also being considered:**
 - **Performance Target**
 - ♦ Utility receives performance-based incentive of an additional 10% of program costs if it achieves EE portfolio goals
 - **Cost Capitalization (similar to approach used in NV)**
 - ♦ Utility capitalizes the annual cost of the EE program over the first 5 years of the installed measures @ Authorized ROE (10.75%) + 500 basis points
 - **Shared Net Benefits (Similar to approach used in CA and MN)**
 - ♦ Utility retains 15% of the PV of TRC net benefits from the portfolio of EE programs

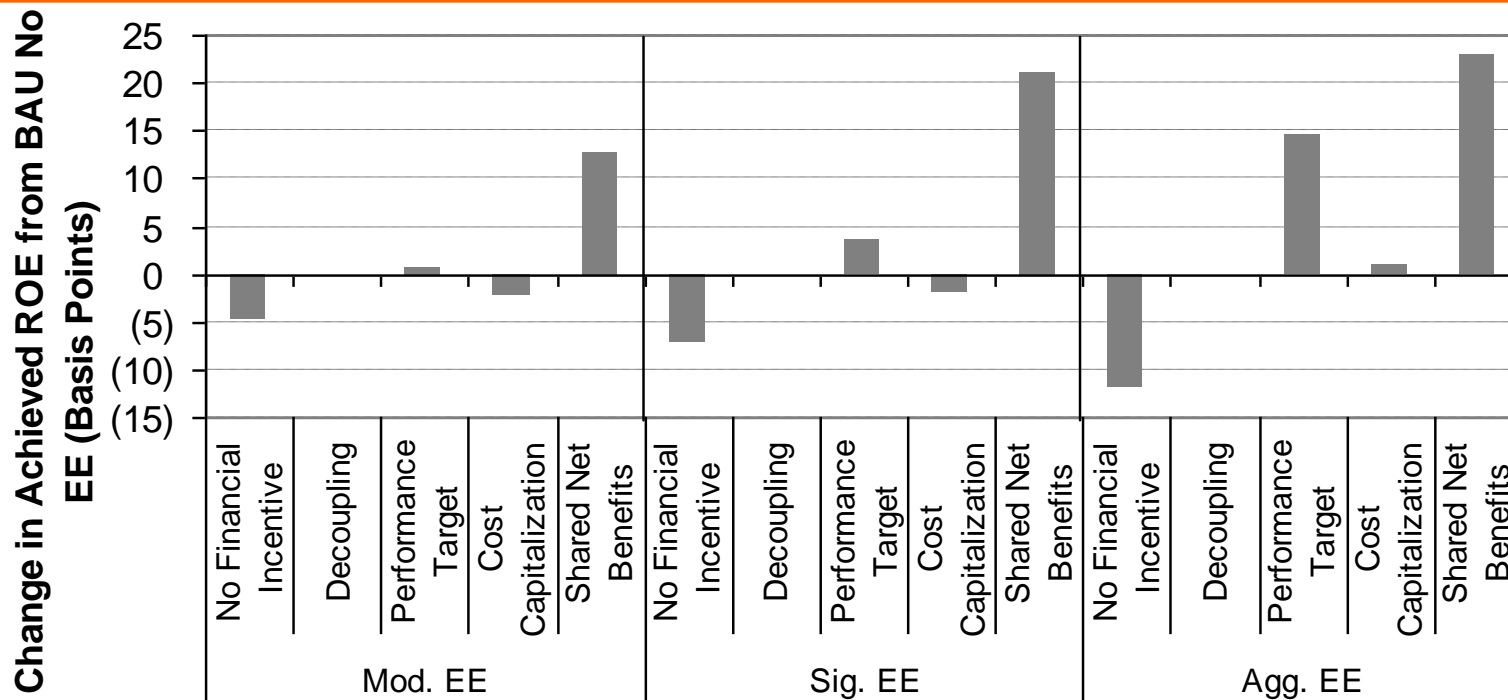
Assessment of Shareholder Incentives



- **Because the Performance Target and Cost Capitalization are tied to costs, their share of total program costs (~15%) is invariant to size of EE portfolio**
- **The Shared Net Benefits mechanism directly integrates both benefits AND costs and so incentive level impacted (i.e., reduced) as savings levels increase**
- **All three mechanisms provide ratepayers with lion's share of total resource benefits**

Shareholder Perspective

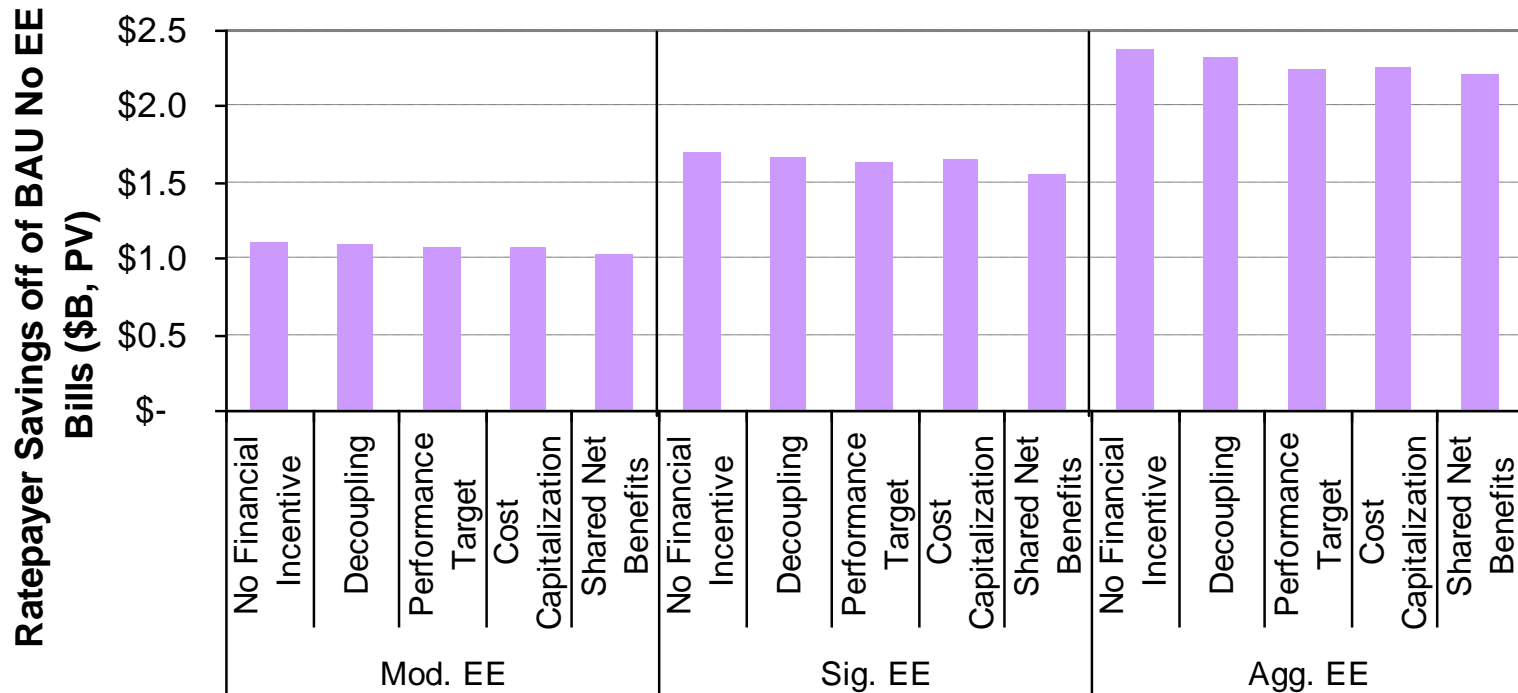
Effect of Decoupling or Shareholder Incentives



- Decoupling removes financial disincentive but provides no positive reward to shareholders for utility's achievement of EE savings goals
- Shareholder incentive mechanisms may improve utility's business case for EE if utility management is focused on ROE (depending on design of incentive mechanism) rather than absolute level of earnings

Ratepayer Perspective: Avg. Bills

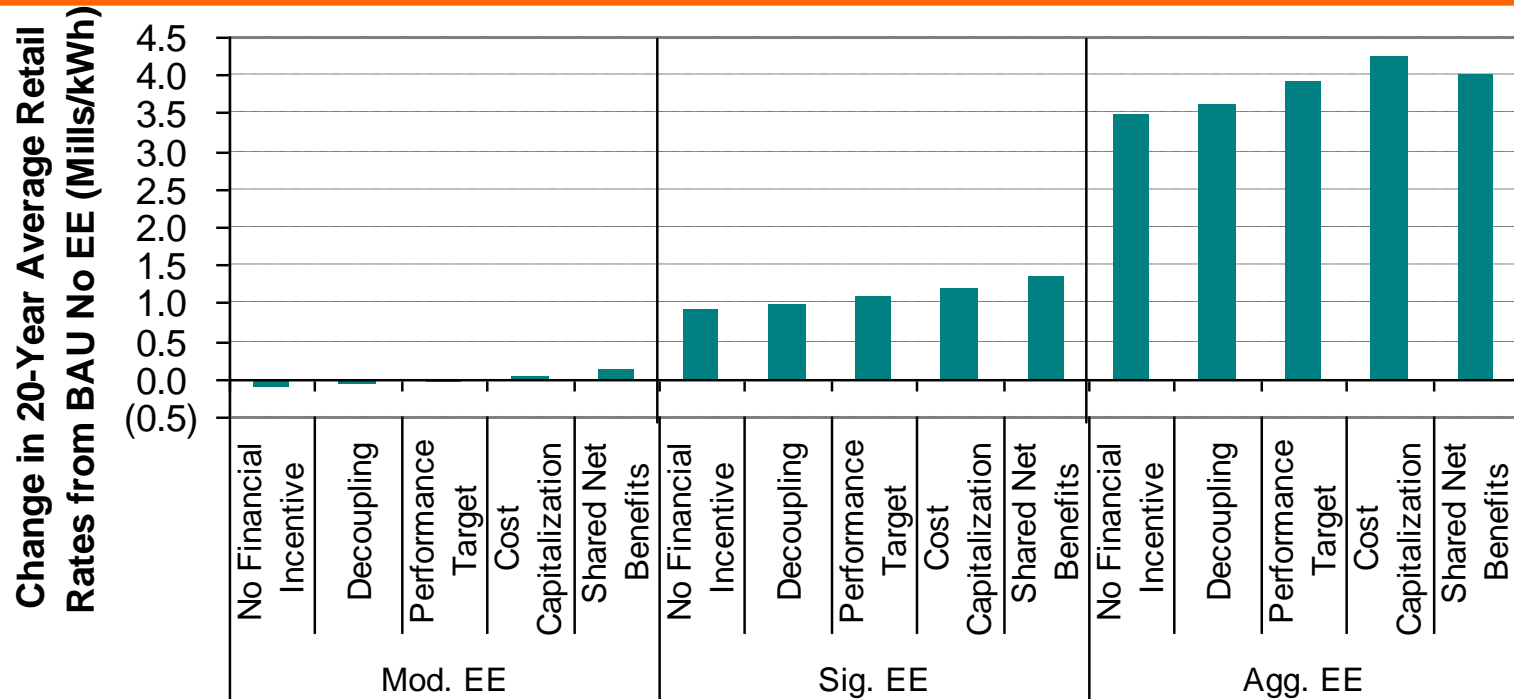
Effect of Decoupling or Shareholder Incentives



- EE reduces fuel and purchases power costs and defers supply-side resources; value of EE to ratepayers increases with deeper savings levels (\$1B to \$2.3B in savings for Moderate and Aggressive EE portfolio)
- Average utility bills decrease by 3-6% with EE, even with decoupling or shareholder incentives applied

Ratepayer Perspective: Avg. Rates

Effect of Decoupling or Shareholder Incentives



- Average retail rates decrease by 0.1 mills/kWh in Mod. EE case and increase by ~1.0 – 3.5 mills/kWh for Sig. and Agg. EE portfolios
- Additional cost of decoupling (~0.1 mills/kWh) or shareholder incentives (0.1 to 4.0 mills/kWh) increases rates minimally (<0.1% to 2% higher in 2027)

Conclusions & Take-Aways

- Aggressive and sustained EE efforts can produce significant net resource benefits; however the larger the EE effort, the more such efforts conflict with utility shareholder financial interests
 - Shareholder returns decrease as net resource benefits rise and ratepayer bill savings increase
- Decoupling can remove the financial disincentive to EE; shareholder incentives may improve the business case for EE to a utility or its shareholders
- Jointly offering decoupling and incentive mechanisms that provide relatively stable returns to shareholders over wide range of EE savings targets present less risk to shareholders...
 - ... but may not induce the achievement of EE savings levels desired by ratepayers and regulators

National Trends in EE Incentives

- **Approach and attitudes towards decoupling and shareholder incentives differ substantially across the country and among stakeholder groups**
 - **EE and environmental groups: Typically prefer “well-designed” decoupling to a “lost revenue recovery mechanism**
 - **Increasing interest in “sustainable” business models for EE among utilities and some other parties**
 - **Contentious debate on the earnings basis and appropriate level of compensation for EE (e.g. Save-A-Watt offers different risk and reward structure)**
 - **Consumer advocates and others looking at non-utility models for EE administration**
 - ♦ Particularly if utilities propose incentive mechanisms that provide significant share of net resource benefits to shareholders or increase program costs significantly
 - **EE Portfolio standards in some states adds new wrinkle to incentives discussion**
 - ♦ Consumer groups: Legislative mandate establishes minimum, acceptable EE performance level for utility (without incentives); EE efforts beyond that level may be eligible for incentives
 - ♦ Where EE savings targets have been set by state regulators, broader space for shareholder incentives discussion

Questions?

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