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**

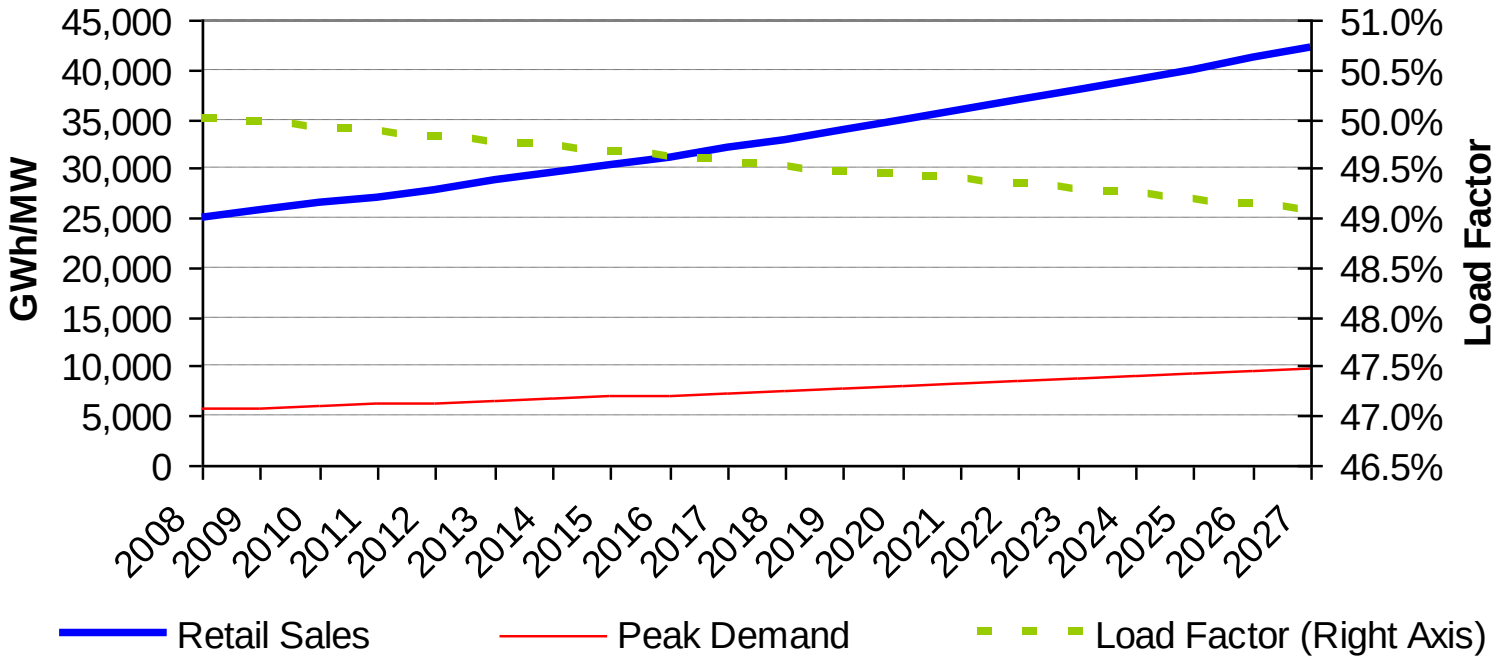
Project Approach & Objectives (2)

- **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

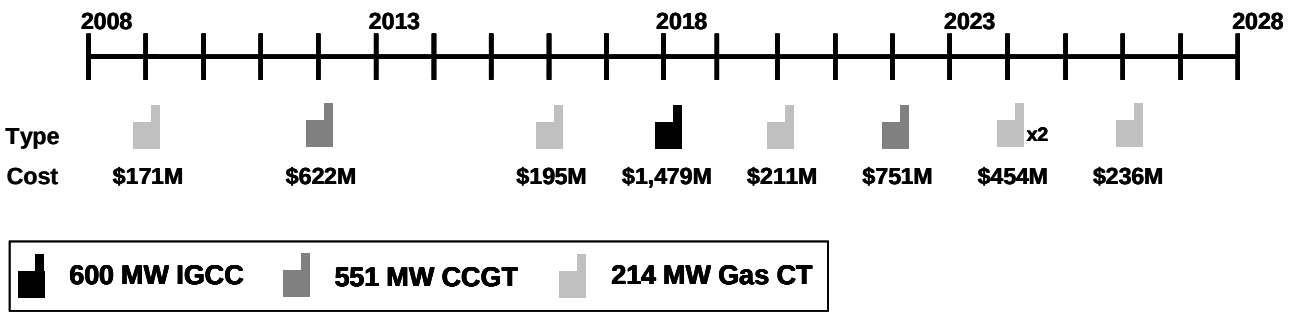
Prototypical SW Utility: Retail Sales and Demand Forecast



- **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%
All-In Retail Rate	*9.1 ¢/kWh*	*13.1 ¢/kWh*	*18.9 ¢/kWh*	*3.9%*



- **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: Peak Period Savings (GWh)	Lifetime Impacts: Energy and Demand Savings: Off-Peak Period Savings (GWh)	Lifetime Impacts: Energy and Demand Savings: Peak Demand Savings (MW)	Lifetime Impacts: Program Costs: Program Admin. Costs (¢/Lifetime kWh)	Lifetime Impacts: Program Costs: 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

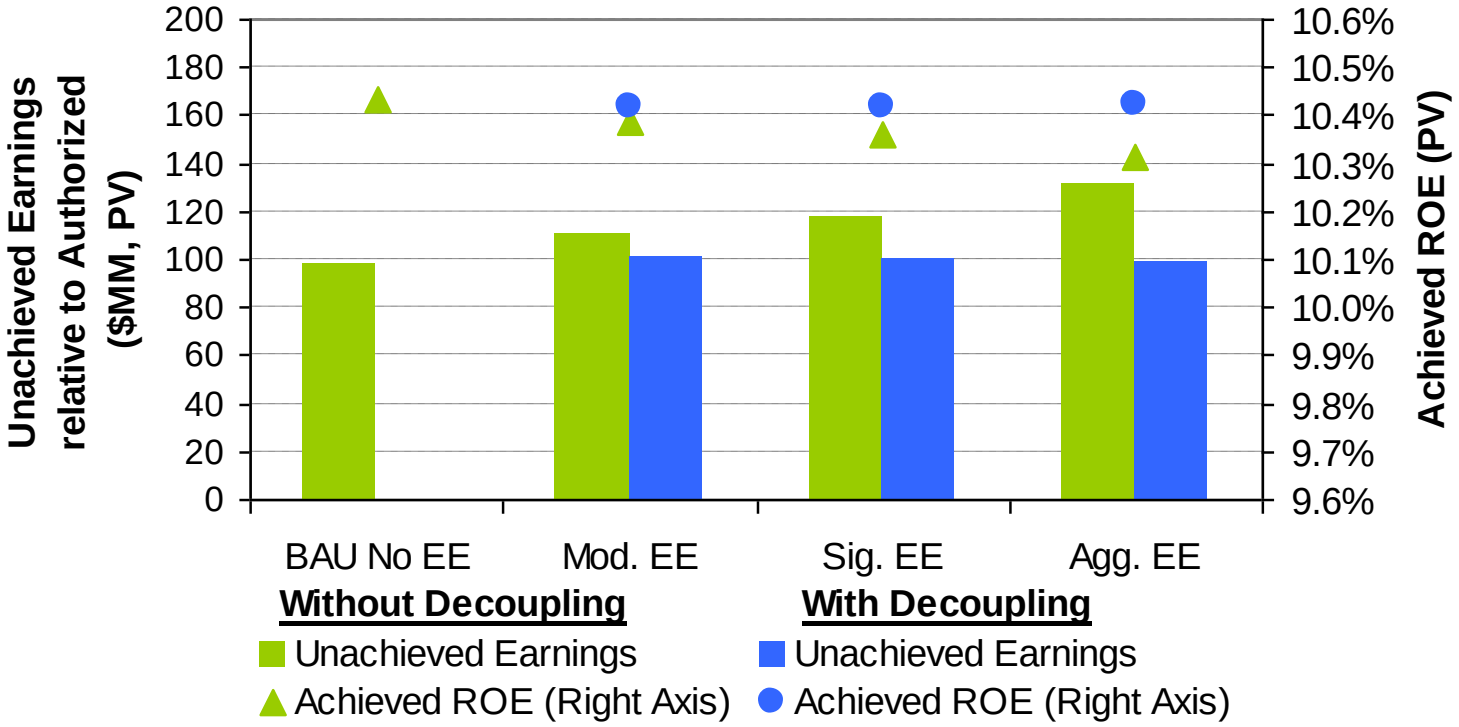
- **Assume utility delivers EE programs for 10 years**
- **Assume 11 year avg. measure lifetime of EE portfolio**
- **Assume Sig. and Agg. EE portfolios have higher costs than Mod. EE portfolio due to more expensive measures and higher customer incentives**
- **EE still costs considerably less than supply-side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

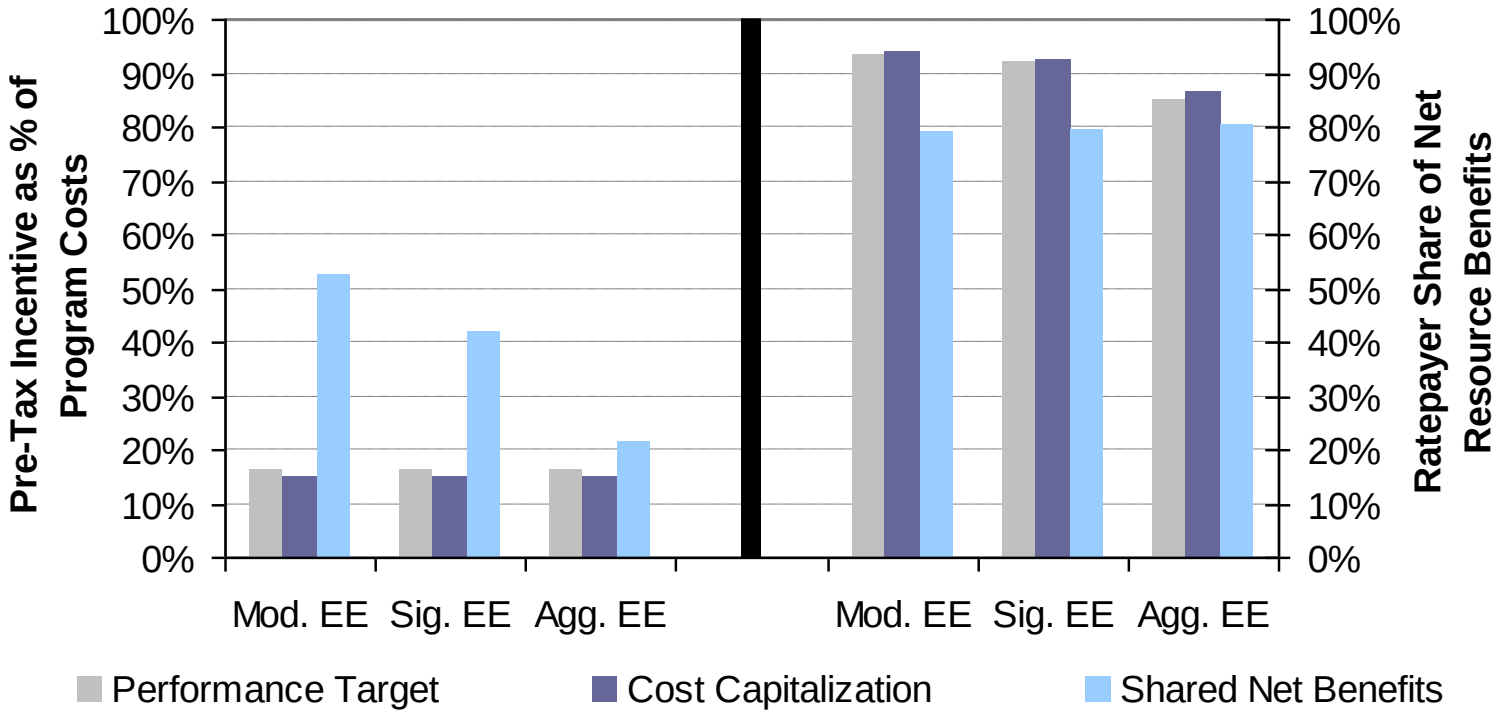


- **Revenue-Per-Customer decoupling mechanism removes financial disincentive to EE as utility ROE is comparable to the BAU No EE case for any EE portfolio**

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

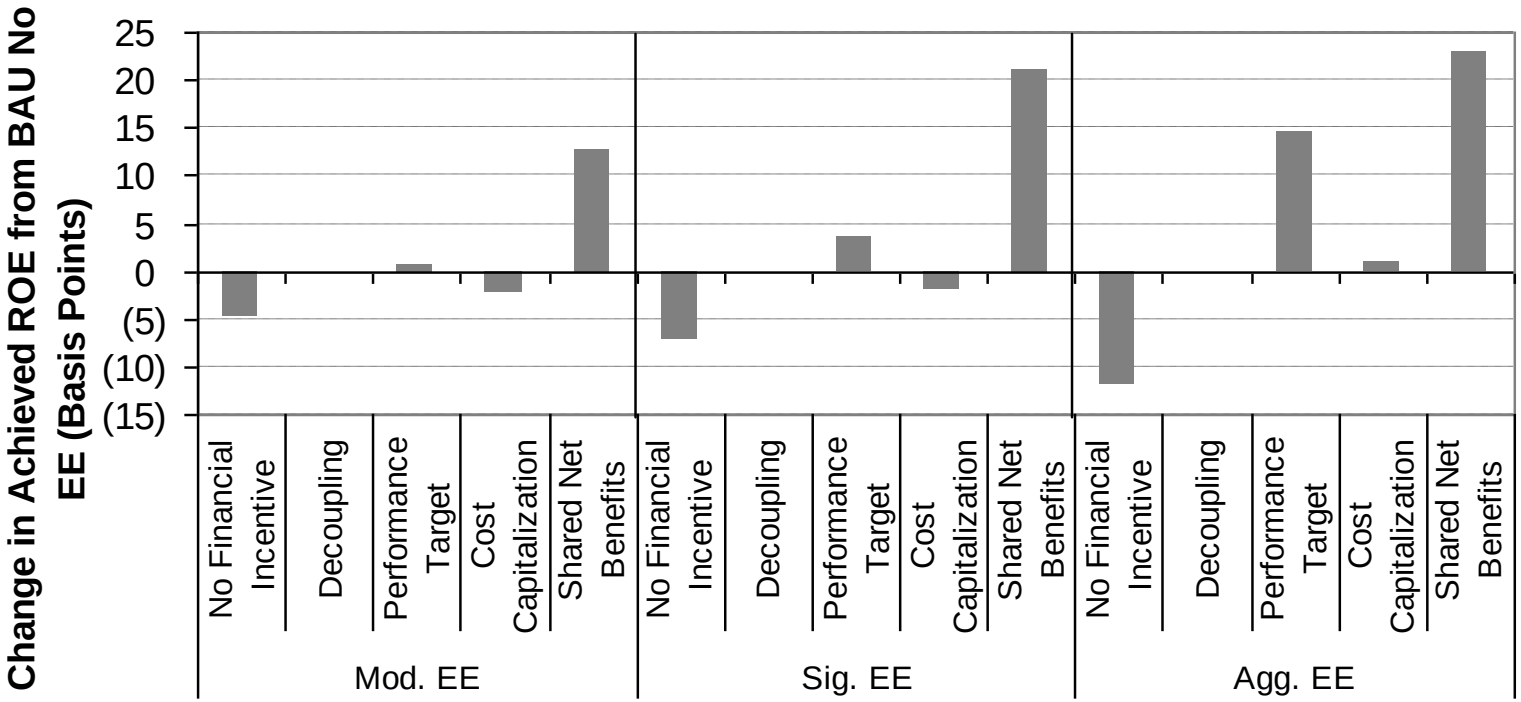
Assessment of Shareholder Incentives



- **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**

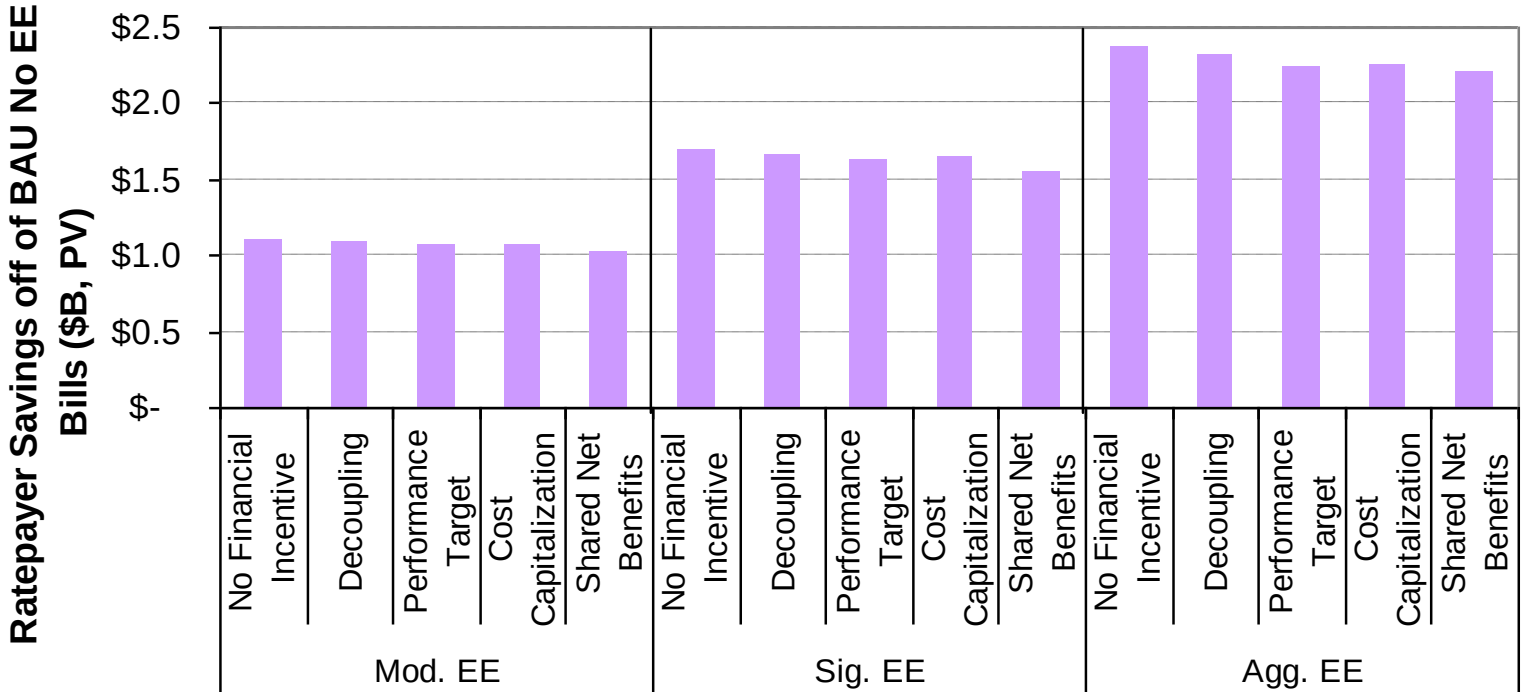
Shareholder Perspective

Effect of Decoupling or Shareholder Incentives



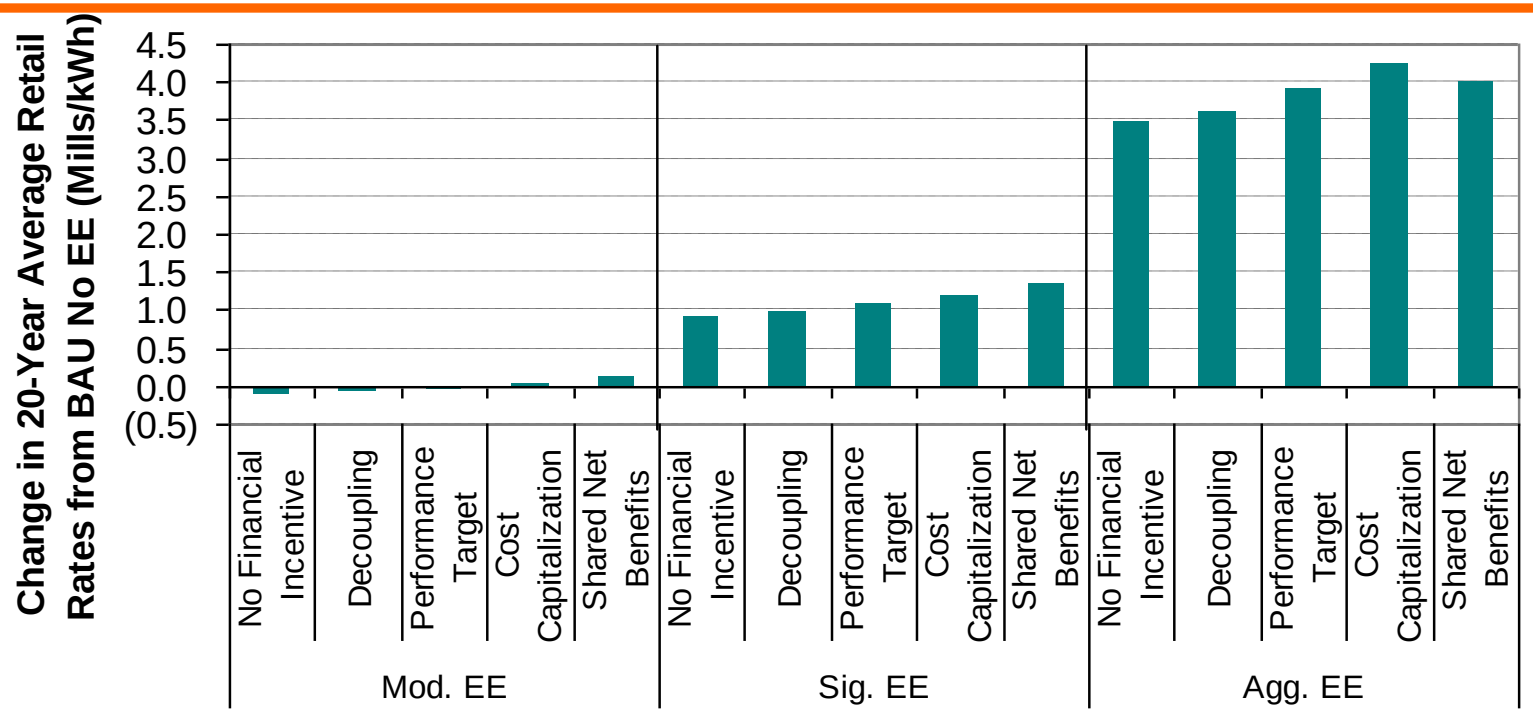
- **Decoupling removes financial disincentive but provides no positive reward to shareholders for utility's achievement of EE savings goals**
- **Shareholder incentive mechanisms may improve utility's business case for EE if utility management is focused on ROE (depending on design of incentive mechanism)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