

# Utility Business Models for Energy Efficiency and Renewable Energy

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China ♦ India ♦ European Union ♦ Latin America ♦ United States

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# Three Essentials of Utility Business Models

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- Disincentives
  - Decoupling
- Positive Incentives
  - Percentage of Spending
  - Capitalization of Costs
  - Shared Savings
- Efficiency and Renewable Energy Goals
  - Requirements or Targets
  - Evaluation, Measurement and Verification



# Current Utility Business Model

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- Revenue Requirement = Test Year Costs + Allowed Profit
- Regulated Price = Revenue Requirement ÷ Test Year Sales
- Actual Revenues = Actual Sales X Regulated Price
- Actual Profits = Actual Revenues – Actual Costs



# Hypothetical Utility

Assumptions						
Operating Expenses	<b>\$160,000,000</b>					
Rate Base	<b>\$200,000,000</b>					
Tax Rate	<b>35.00%</b>					
Cost of Capital	% of Total	Cost Rate	Wtd. Cost		Dollar Cost Amt.	
			Pre-tax	After-Tax	Pre-Tax	After-Tax
Debt	<b>55.00%</b>	<b>8.00%</b>	4.40%	2.86%	\$8,800,000	\$5,720,000
Equity	45.00%	<b>11.00%</b>	4.95%	<u>7.62%</u>	\$9,900,000	\$15,230,769
Total	100.00%			10.48%		
Revenue Requirement						
Operating Expenses	\$160,000,000					
Debt	\$5,720,000					
Equity	\$15,230,769					
Total	\$180,950,769					
<b>After-Tax Earnings</b>	<b>\$9,900,000</b>					



# Impact of Changes in Sales Volume On Earnings

% Change in Sales	Revenue Change		Impact on Earnings		
	Pre-tax	After-tax	Net Earnings	%Change	Actual ROE
-5.00%	-\$9,047,538	-\$5,880,900	\$4,019,100	-59.40%	4.47%
-4.00%	-\$7,238,031	-\$4,704,720	\$5,195,280	-47.52%	5.77%
-3.00%	-\$5,428,523	-\$3,528,540	\$6,371,460	-35.64%	7.08%
-2.00%	-\$3,619,015	-\$2,352,360	\$7,547,640	-23.76%	8.39%
-1.00%	-\$1,809,508	-\$1,176,180	\$8,723,820	-11.88%	9.69%
-0.00%	\$0	\$0	\$9,900,000	0.00%	11.00%
1.00%	\$1,809,508	\$1,176,180	\$11,076,180	11.88%	12.31%
2.00%	\$3,619,015	\$2,352,360	\$12,252,360	23.76%	13.61%
3.00%	\$5,428,523	\$3,528,540	\$13,428,540	35.64%	14.92%
4.00%	\$7,238,031	\$4,704,720	\$14,604,720	47.52%	16.23%
5.00%	\$9,047,538	\$5,880,900	\$15,780,900	59.40%	17.53%



# Application of Decoupling

<b>% Change in Sales</b>	<b>Test Year Sales</b>	<b>Actual Sales</b>	<b>Allowed Revenues</b>	<b>Decoupled Price</b>
-5.00%	1,809,508,000	1,719,032,600	\$180,950,800	\$0.1053
-4.00%	1,809,508,000	1,737,127,680	\$180,950,800	\$0.1042
-3.00%	1,809,508,000	1,755,222,760	\$180,950,800	\$0.1031
-2.00%	1,809,508,000	1,773,317,840	\$180,950,800	\$0.1020
-1.00%	1,809,508,000	1,791,412,920	\$180,950,800	\$0.1010
0.00%	1,809,508,000	1,809,508,000	\$180,950,800	\$0.1000
1.00%	1,809,508,000	1,827,603,080	\$180,950,800	\$0.0990
2.00%	1,809,508,000	1,845,698,160	\$180,950,800	\$0.0980
3.00%	1,809,508,000	1,863,793,240	\$180,950,800	\$0.0971
4.00%	1,809,508,000	1,881,888,320	\$180,950,800	\$0.0962
5.00%	1,809,508,000	1,899,983,400	\$180,950,800	\$0.0952

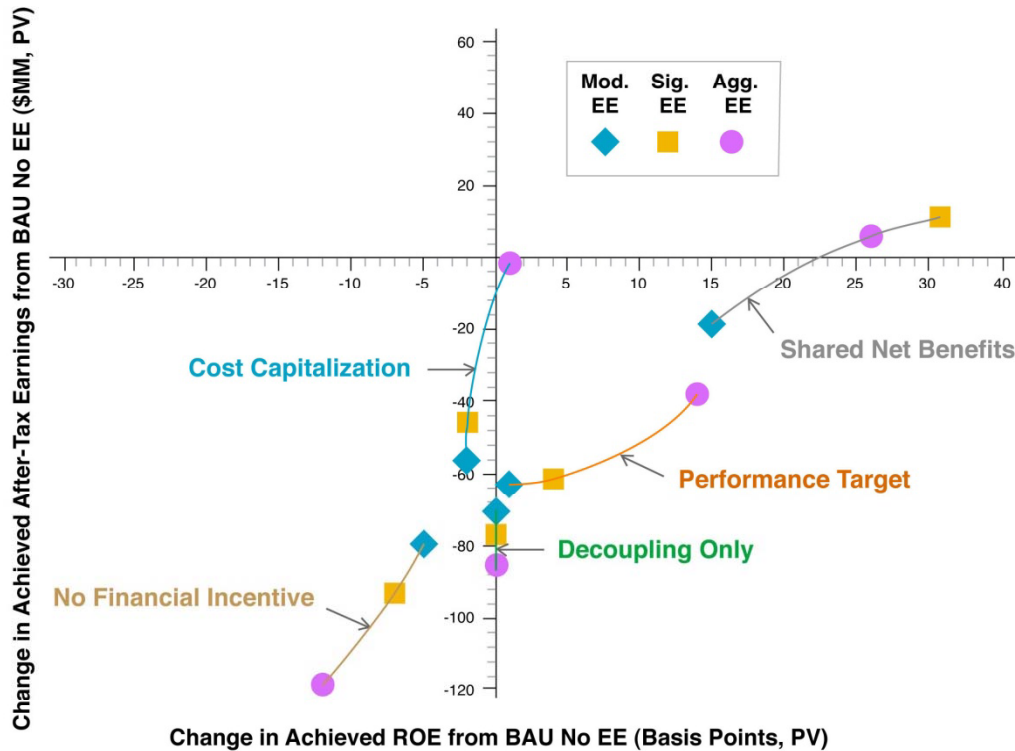


# Methods for Positive Incentives

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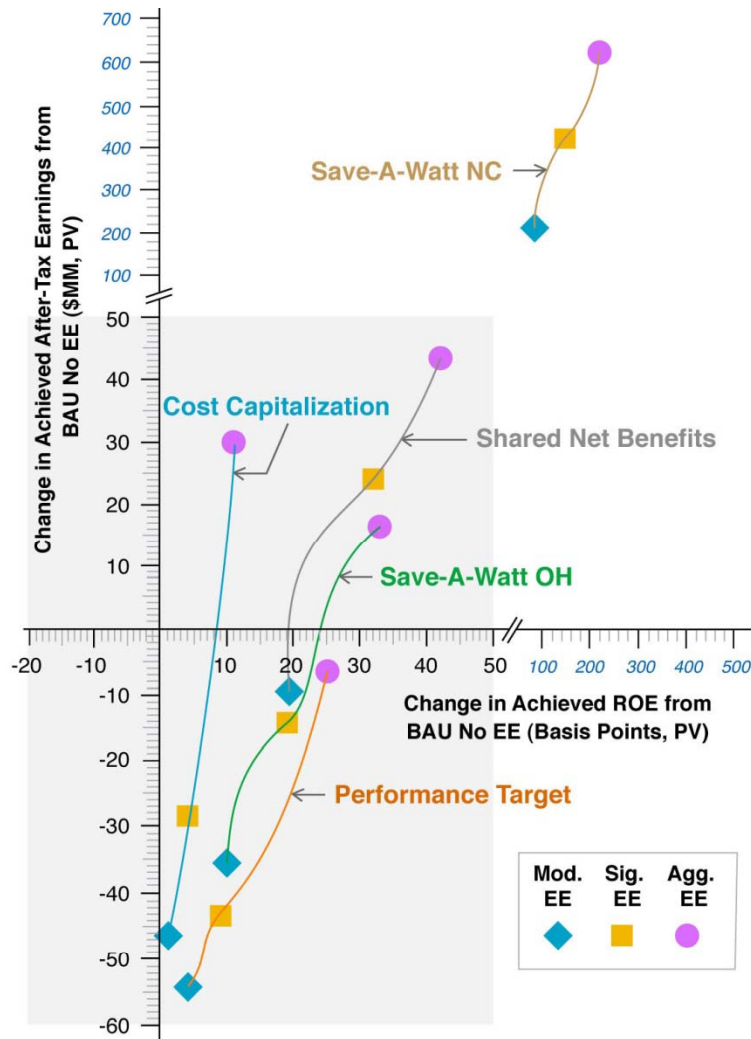
- Performance Target/Share of Budget
- Capitalization, with optional bonus rate of return
- Shared Net Benefits

# Effect of Decoupling or Shareholder Incentives on Utility ROE and Earnings



- Application of full RPC decoupling entirely removes short-term disincentive from any reduction in sales between rate cases, but does not improve earnings opportunities
- Performance Target and Shared Net Benefits are only mechanisms that produce positive change in ROE for all EE savings levels if implemented alone
- Increase in earnings with Shared Net Benefits increase in Sig. and Agg. EE case compared to BAU No EE case

# Effect of Lost Fixed Cost Recovery & Incentive Mechanisms on Utility ROE and Earnings



Source: LBNL

- EE more likely to be “profit center” for utility if combine mechanisms
- ROE of SW utility always increases if combine decoupling & incentive mechanism, compared to BAU No EE case
- Earnings generally increase only in the Agg. EE case
- Save-A-Watt (NC) provides utility with opportunity for much higher earnings and ROE if achieve EE savings targets