Energy Efficiency & Utility Profits:

Aligning Incentives with Public Policy

New Hampshire

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Rick Weston

The Regulatory Assistance Project

50 State Street, Suite 3
Montpelier, Vermont USA 05602
Tel: 802.223.8199
Fax: 802.223.8172

27 Penny Lane
Cedar Crest, New Mexico USA 87008
Tel: 505.286.4486
E-Fax: 773.347.1512

110 B Water St.
Hallowell, Maine USA 04347
Tel: 207.623.8393
Fax: 207.623.8369

Website: *http://www.raponline.org*

About RAP

- RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP Principals all have extensive utility regulatory experience.
- Funded by US DOE & EPA, Energy Foundation and other foundations, and international agencies. We have worked in 40+ states and 16 nations.
- RAP advises governments directly, does not appear for parties in contested cases (but may be Commission witness or adviser)
- Also provides educational assistance to stakeholders, utilities, and advocates.

Traditional Regulatory Methods Provide Strong Disincentives for Customer-Sited Resources

- Utility revenues and profits are linked to unit sales (kW, kWh, therms, etc.)
  - But, in the short run, a utility's marginal costs are only vaguely related to electricity demand (more on this in a moment)
- Loss of sales due to successful acquisition of energy efficiency and DG/CHP will lower utility profitability
- This is true regardless of the means of delivering the EE and other programs
  - The incentive remains even where net revenues lost as a consequence of efficiency are recompensed
- *The effect may be quite powerful. . .*

How Powerful is the Effect?

- On vertically integrated utilities
  - Reduced sales revenues, offset by avoided generation costs
    - Relative impacts to the bottom line are smaller than they are to:
- Wires-only companies
  - Reduced sales revenues, offset by minimal or no avoided T&D costs
- In this decade, decoupling has been applied to base, non-commodity costs in gas and electricity
  - Pass-throughs for more than half of a utility's costs, i.e., the gas commodity or fuel and purchased power

Assumptions for a Sample Distribution Utility

Assumptions	
Operating Expenses	$160,000,000
Rate Base	$200,000,000
Tax Rate	35.00%

Cost of Capital	% of Total	Cost Rate	Weighted Cost Rate		Dollar Amount	
			After-Tax	Pre-Tax	After-Tax	Pre-Tax
Debt	55.00%	8.00%	4.40%	2.86%	$8,800,000	$5,720,000
Equity	45.00%	11.00%	4.95%	7.62%	**$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
Allowed Return on Equity	**$9,900,000**

How Changes in Sales Affect Earnings

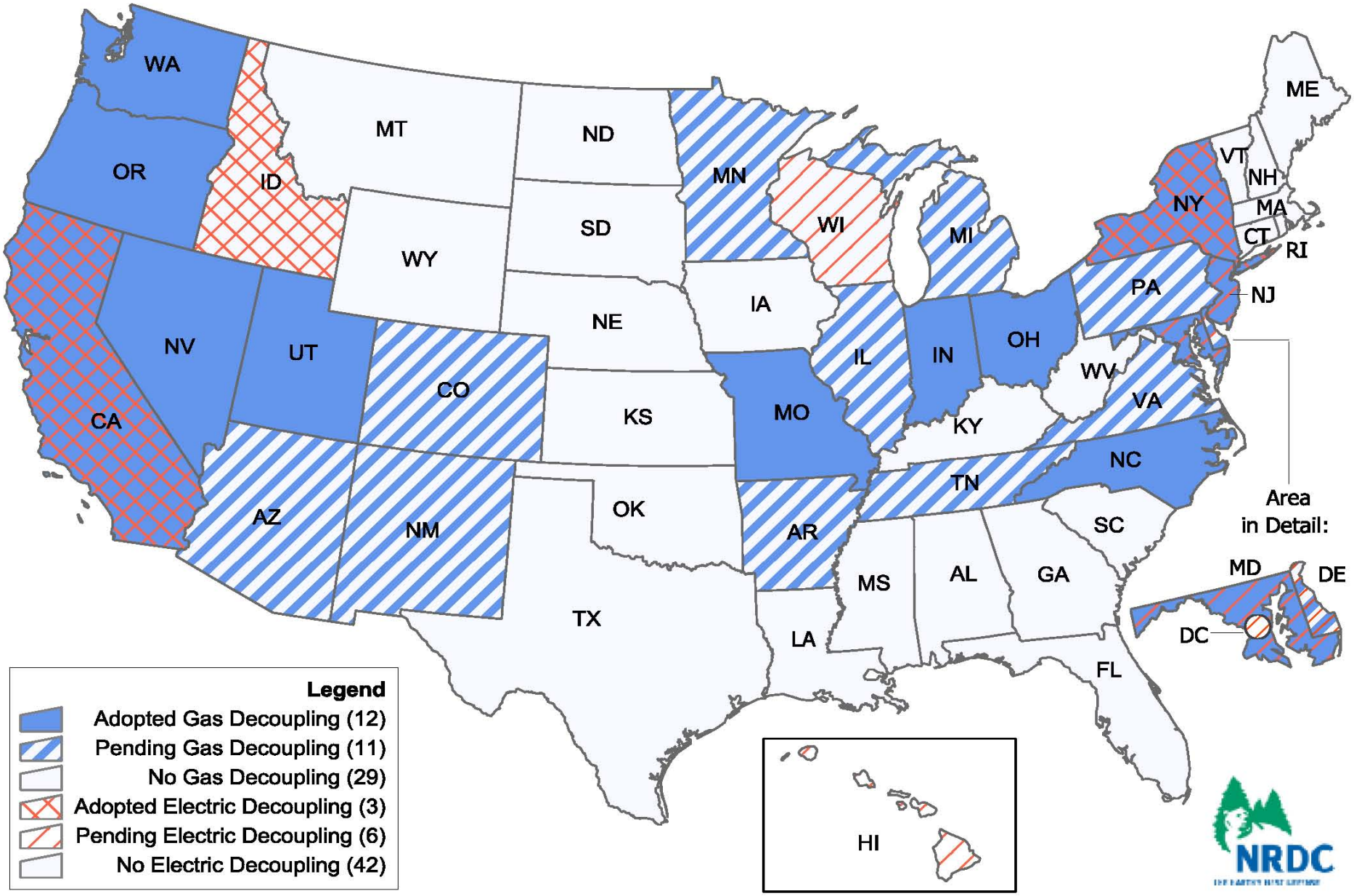
	Revenue Change		Impact on Earnings		
% Change in Sales	Pre-tax	After-tax	Net Earnings	% Change	Actual ROE
5.00%	$9,047,538	$5,880,900	$15,780,900	**59.40%**	17.53%
4.00%	$7,238,031	$4,704,720	$14,604,720	**47.52%**	16.23%
3.00%	$5,428,523	$3,528,540	$13,428,540	**35.64%**	14.92%
2.00%	$3,619,015	$2,352,360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

Least-Cost Service Should be the Most Profitable

- The "throughput" incentive is at odds with public policy to supply electric power services at the lowest total cost:
  - inhibits a company from supporting investment in and use of least-cost energy resources, when they are most efficient,
  - encourages the company to promote incremental sales, even when they are wasteful
- Ratemaking policy should align utilities' profit motives with public policy goals: acquiring all cost-effective resources, whether supply or demand
- The utilities' throughput incentive promotes inefficient outcomes, even where:
  - there is no programmatic energy efficiency; and
  - even with third-party administration of energy efficiency programs.

- ***We need a different business model for utility profitability***

Gas and Electric Decoupling in the US



Revenue-Sales Decoupling

- Breaks the mathematical link between sales volumes and revenues (and, ultimately, profits)
  - Makes revenue levels immune to changes in sales volumes
  - Fundamentally, it's a matter of enabling recovery of the utility's prudently incurred fixed costs, including return on investment, in a way that doesn't create perverse incentives for unwanted actions and outcomes
- Two objectives:
  - To protect the utility from the financial harm associated with least-cost actions and
  - To remove the utility's incentive to increase profits by increasing sales
- Decoupling revenues, rather than earnings directly, preserves the utility's incentive to improve its operational and managerial efficiency
- This is a <u>revenue</u> issue, not a <u>pricing</u> issue: it is not intended to decouple customers bills from consumption
  - Unit-based consumption pricing approaches remain
  - Customers continue to see the cost implications of their consumption decisions, while the utility's risks associated with variations in sales due to efficiency are mitigated
  - Unit-based consumption pricing reflect the relationship between demand and cost causation in the long-run
    - Especially true of the costs of wires, but also of generation

Revenue Decoupling: The Essential Concept

- Basic Sales-Revenue Decoupling
  - Utility “base” revenue requirement determined with traditional rate case
  - Each future period has a calculable “allowed” revenue requirement
  - Differences between the allowed revenues and actual revenues are tracked
    - Variety of ways of tracking differences
  - The difference (positive or negative) is flowed back to customers in a small adjustment to unit rates

Relating Regulatory Methods to Cost Drivers

- Regulation should more directly link utility remuneration to the costs the utility faces
- What drives utility costs?
  - In the long-run
    - Demand for electricity service is the primary driver of costs
  - But in the short-run (the rate-case horizon)
    - Utility costs vary more directly with numbers of customers than with sales
    - Particularly true of unbundled distribution service, where the marginal costs of delivery are, on average, very low or nil, but for which the costs of acquiring and serving customers are significant and recurring

Revenue-Per-Customer Decoupling

- Holds class average revenues-per-customer (RPC) constant
  - Or may have a periodic increase or decrease in average revenues-per-customer
- Based on prior rate case values
- Monthly (or other periodic) adjustment mechanism similar to traditional fuel and purchase power adjustments
- See Maryland (BG&E) for an example

“Advanced” Decoupling: Multi-Year Programs

- RPC value periodically adjusted for inflation, productivity increases, or other factors
- Can be combined with performance goals and incentives
- Adjustments can be bounded (SDG&E, SoCalGas) and/or “shared” with customers (PG&E, Northwest Natural Gas)
- California has the most comprehensive decoupling and PBR mechanisms

Decoupling Examples:

- Maryland – Gas Utilities (in place), PEPCO (filed)
- North Carolina – Gas Utilities
- California – 3 IOUs Electric & Gas Utilities
- Oregon – Northwest Natural Gas
- New Jersey (NJNG)
- Utah (Questar)
- Indiana & Ohio (Vectren)
- Vermont (GMP)

Decoupling: Maryland Baltimore Gas & Electric

- Decoupling mechanism for residential and general service gas customers
- Straight revenue-per-customer method
  - Calculated as average-use-per-customer
- Based on prior rate case test year for base revenue per customer
- Monthly adjustment mechanism similar to traditional fuel and purchase power adjustments
- BG&E program formed the basis of the MADRI Model Rate Rider

Maryland: BG&E's Decoupling

- Allowed Revenues = Test Year Average Use per Customer * Delivery Price * No. of Customers
  - Note: Test Year Avg. Use/customer * Delivery Price = RPC
    - Can also be calculated as Total Revenue Requirement ÷ No. of Customers
  - BG&E uses this approach to capture the revenue differences between existing and new customers
    - The "K" factor, as developed by RAP in *Profits and Progress Through Distributed Resourses* (2000)
- Adjustment to Delivery Price = (Allowed Revenues - Actual Revenues) ÷ Estimated Sales
- Any difference between actual and estimated sales is reconciled in a future month
- Calculated separately for each class
- Calculations of the billing adjustments are filed monthly with the Public Service Commission

MADRI Model Revenue Stability Rider

- Mid-Atlantic Distributed Resources Initiative
  - Aimed at developing state and regional policies and programs to increase deployment of distributed energy resources (EE, DG/CHP, other demand response) in 5 mid-Atlantic states
  - Developed model decoupling approach, based on BG&E program
    - PEPCO proposals based on the model
  - Makes use of a “K” factor to adjust for expected changes in revenues that utility would have experienced under traditional regulation
    - “K” factor is linked to expected changes in average use per customer, as in the BG&E program
    - It doesn’t reward or penalize the utility for changes in usage—instead, it is intended to eliminate the risk of a predictable windfall or loss

Changes in Risk and in Risk Allocation

- Weather
  - Under traditional price regulation, weather risk is shared by ratepayers and shareholders
    - Hot summer, cold winter: customers pay more and shareholders earn more
    - Cool summer, warm winter: customers pay less and shareholders earn less
  - Under RPC decoupling, allowed revenues are weather-normalized
    - Weather-related adjustments are made to assure that actual revenues equal allowed revenues: customers pay, and shareholders earn, neither more nor less as a consequence of weather
- Other risks are similarly treated
- Revenue stabilization and predictability are valued by Wall Street
- Caveat: Need to consider whether and decoupling affects utility attitudes towards customer service
  - Can be addressed through targeted incentives

Incentives

- Decoupling makes a utility indifferent to the effects of efficiency and, by itself, will not necessarily create corporate enthusiasm for it
  - If the purpose of adopting decoupling is to facilitate increased investment in EE, then an expressed commitment to EE should accompany a decision to decouple.
- In addition, regulators may wish to consider financial rewards for superior performance in achieving desired policy outcomes
  - Increase ROE for cost-effective EE and other specified investments
  - Shared savings
  - Payments for meeting specified performance targets
    - MWh and MW savings
    - Customer service standards
- Available in a number of states
  - E.g., AZ, CT, MA, MN, NH, NV, VT

Appendices

New Mexico: Example of Clear Policy Direction

- It serves the public interest to support public utility investments in cost-effective energy efficiency and load management by removing any regulatory disincentives that may exist and allowing recovery of costs for reasonable and prudently incurred expenses of energy efficiency and load management programs
- The commission shall identify any disincentives or barriers that may exist for public utility expenditures on energy efficiency and load management and, if found, ensure that they are eliminated in order that public utilities are financially neutral in their preference for acquiring demand or supply-side utility resources

New Mexico Statutes, Chapter 62-17-2

Decoupling: North Carolina An Interesting Read

- North Carolina's three major gas utilities have decoupling mechanism
- Expressed importance of highly volumetric rate structures and lower fixed customer charges
- Good overall discussion of policy framework for decoupling
  - Rejected higher fixed-charge approach as unpopular with customers
  - Rejected Attorney General's argument that decoupling would penalize customers for conserving

North Carolina: Customers & Shareholders

- "Different usage patterns and tariffs of industrial customers" provide good cause to exclude class from mechanism
- Approved as an experimental tariff limited to no more than 3 years
- Required utility contribution toward conservation programs (e.g. $500,000 per year for Piedmont)
- Required utility to work with the Attorney General and the Public staff to develop appropriate and effective conservation programs to assist its residential and commercial customers

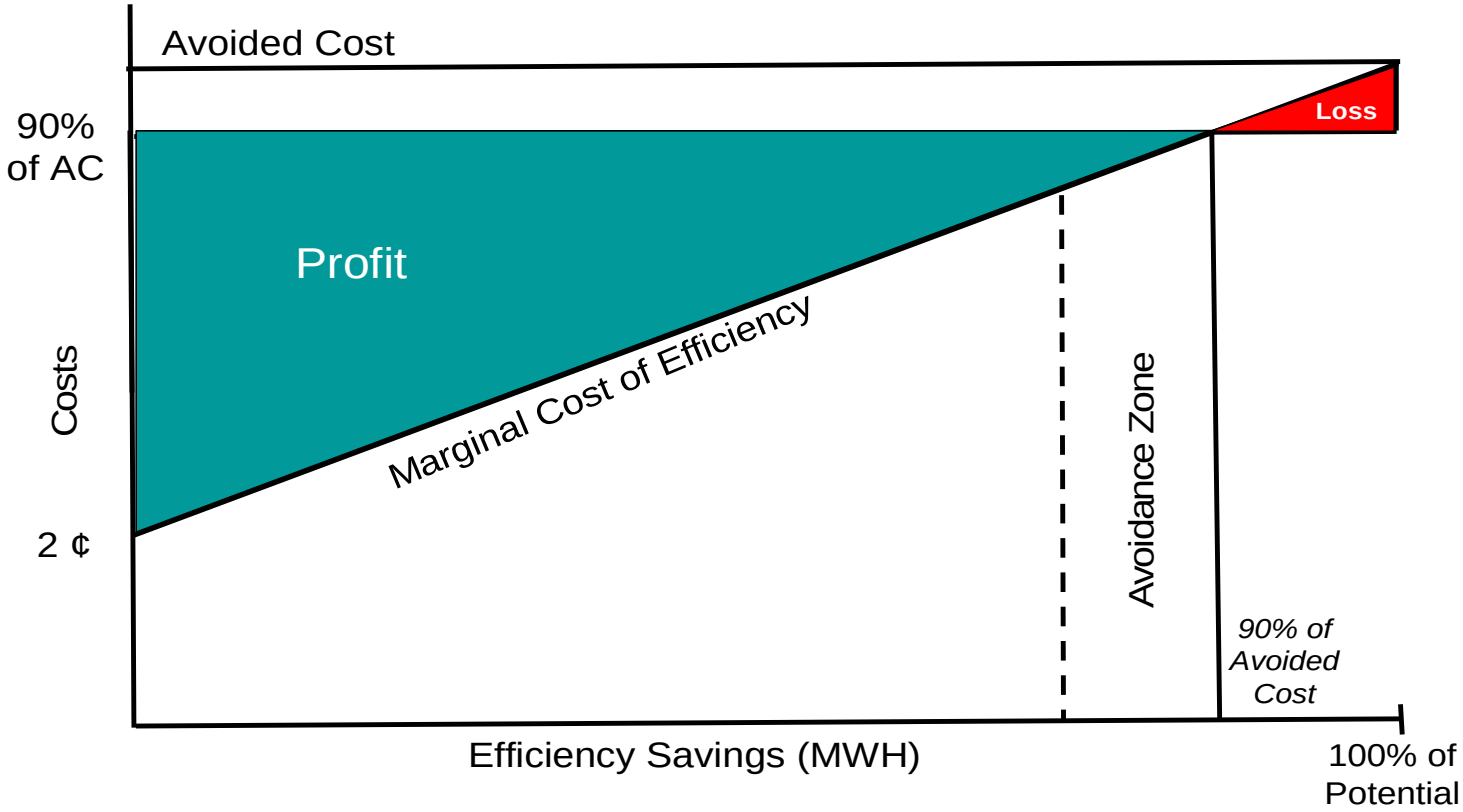
North Carolina Rationale for Decoupling

- Recognized conservation has potential for financial harm to the utility and its shareholders
- Cited number of benefits: Improved opportunities for conservation of energy resources, savings for customers, downward pressure on wholesale gas prices, helping utility recovery of margin and a reasonable return
- Decoupling better aligns interests of Company and customers with respect to conservation
- Commission on Shareholder Risk: "In a period of declining per-customer usage, a mechanism that decouples recover of margin from usage, without requiring the utility to file frequent rate cases or increase unpopular fixed charges, clearly reduces shareholder risk."

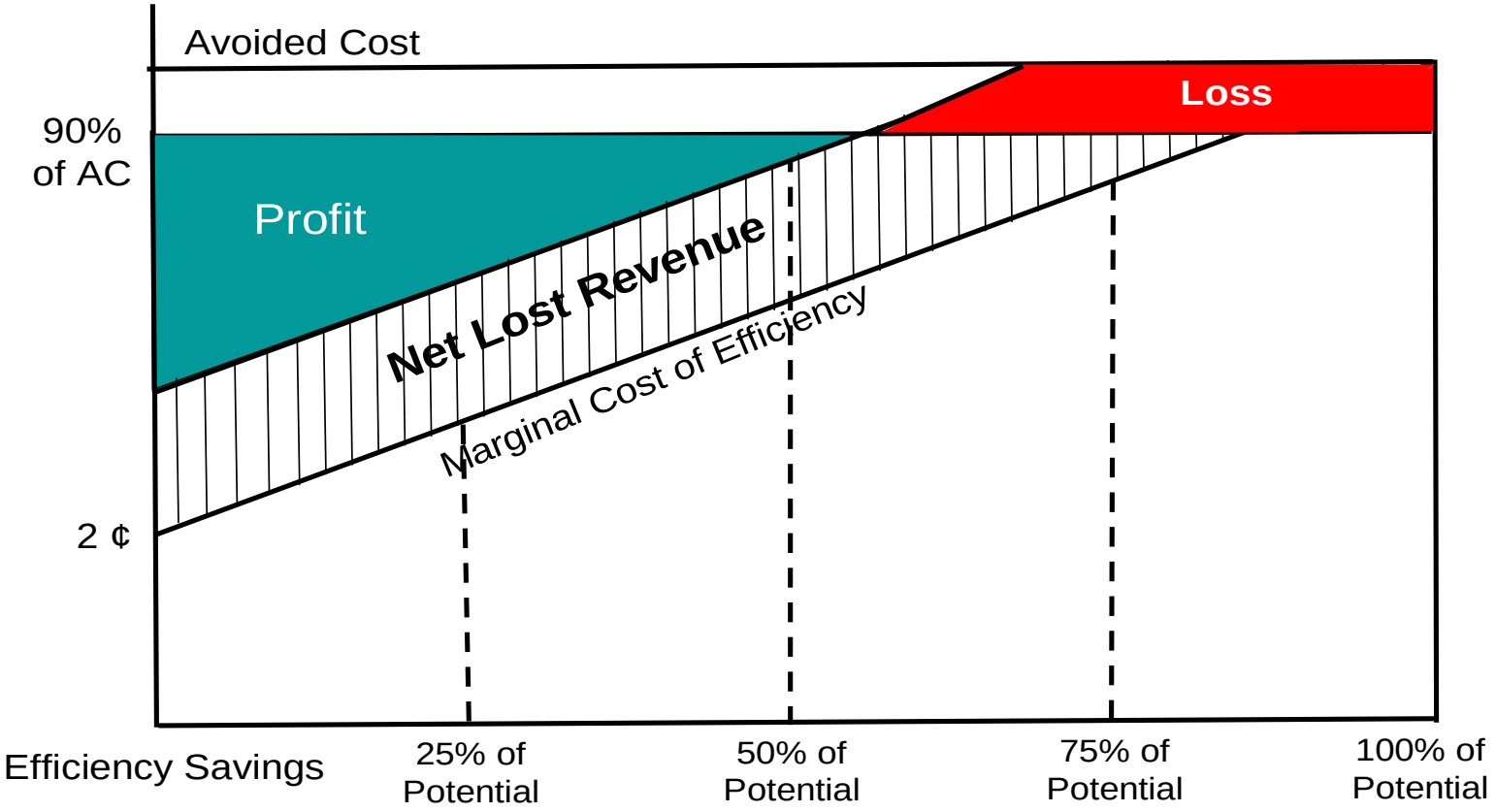
Duke Power's Save-a-Watt Proposal: Not Decoupling

- Is there a new "business model" for EE?
- Duke propose: EE recovery in rates at 90% of avoided cost.
- Goals: simplicity, equity, utility incentive to capture all cost-effective EE
- 90% factor intended to cover all issues: cost of programs, lost revenues & incentives
- Will it work? Will it be proposed elsewhere?
- Conclusion: Decoupling + performance-based incentives would be better

Save-a-Watt: Optimistic view



SAW--What really happens without decoupling

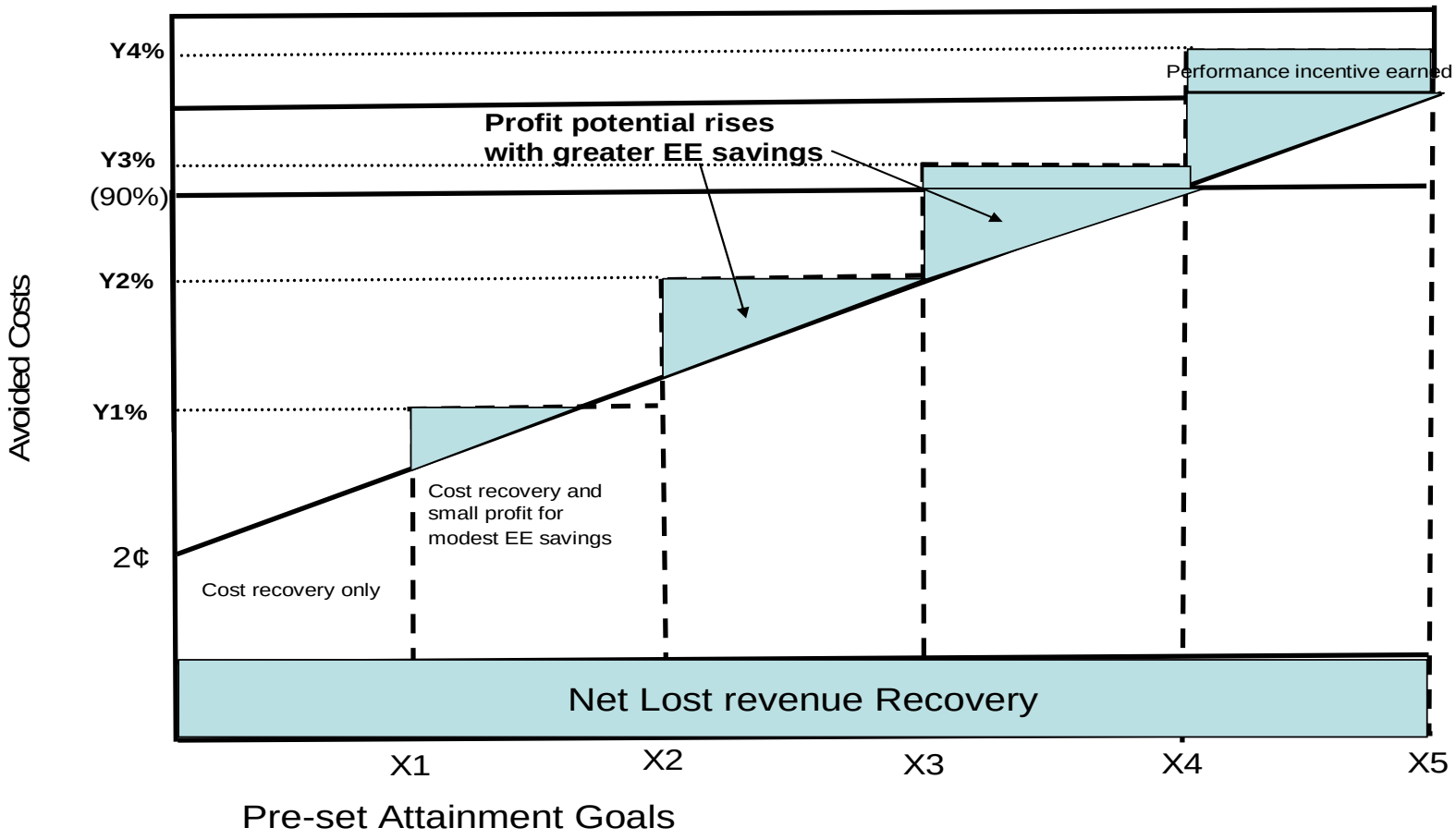


What to do?

- Problems with Save-a-Watt 1.0:
  - Appears to over-compensate low-cost EE;
  - Lost net revenue still a barrier to much cost-effective EE (perhaps 50% of the potential)
  - Mixes load management and EE in the same performance-based system
- Alternatives to consider:
  - Decoupling as a base, eliminates disincentive
  - “Stair-step” increase in profitability as penetration rates, EE delivery, and other goals are achieved
  - Decoupling + PBR for EE is a good package

Decoupling + Performance-based recovery

(recovery can be based on avoided cost, or earnings bonus, or…?)



Which Brings Us To: A Policy Tale of Two Utilities

- Rising revenue-per-customer utilities:
  - Experience rising earnings between rate cases
  - Typical of many electric utilities
- Declining revenue-per-customer utilities:
  - Experience declining earnings between rate cases
  - Typical of many gas utilities
- Under reasonable assumptions, not symmetric between rising and declining cases
- Usually driven by differences in the average consumption between new and old customers
- Policy question: Should decoupling be “profit neutral” relative to future such profit expectations?

California Decoupling Basics

- Part of an aggressive and comprehensive policy framework designed to deploy cost-effective energy efficiency
- Covers SDG&E/SocCalGas, PG&E and SCE
- Tracks difference between allowed revenues and actual revenues
- Trued up each year to that year's authorized revenues
- Revenue requirements are adjusted each year for inflation
- Each utility has individual mechanisms for determining annual revenue requirements

California Case Specifics: Company Plan Features

- Southern California Edison
  - Citing:
    - Poor financial health of company
    - Changed circumstances since such adjustments were rejected (20 years ago)
  - Commission approved “non-test year” revenue requirement adjustments
  - Implemented revenue balancing account for over- under-collections of revenue adjustment
- San Diego Gas & Electric and SoCalGas
  - Each year’s revenue requirement is determined by the previous year’s base margin adjusted by CPI
  - Minimum and maximum authorized adjustments (in 3%-4% range)
  - Balancing account for adjustment collections
  - Sharing mechanism

California: SDG&E/SoCalGas Shareholder & Customer Sharing

Earnings Band	Shareholders	Ratepayers
0 - 50	100%	0%
51 – 100	75%	25%
101 – 125	35%	65%
126 – 150	45%	55%
151 – 175	55%	45%
176 – 200	65%	35%
201 – 300	75%	25%
Over 300	Suspension	

Pacific Gas & Electric

- Separate Distribution and Generation mechanisms:
  - DRAM (Distribution revenue adjustment mechanism) and
  - UGBA (Utility Generation Balancing Account) revenue adjustment mechanisms
- Allowed revenues: annual CPI-based attrition adjustments for 2004-2006, with following minimums and maximums:

Year	Min	Max
2004	2.00%	3.00%
2005	2.25%	3.25%
2006	3.00%	4.00%

Decoupling: Oregon Northwest Natural Gas

- Defers and subsequently amortizes 90 percent of the margin differentials in the residential and commercial customer groups
- Average customer margin-per-therm calculation
- Calculated Monthly
- Places weather risk on utility

MADRI Model Rule

- Used BG&E Rate Rider as starting point
- Model Rule is product of collaborative stakeholder process
- Available at: http://www.raponline.org/Feature.asp?select=78
- Tracks on demand and energy basis
- Currently 60-day lag between consumption & recovery – may present rate design issue
- Lag can be eliminated with a "use and file" approach
- As written, places weather risk on customer – but this is not a policy position *per se*

Positive Incentives

- Arizona
- Connecticut
- Massachusetts
- New Hampshire
- Nevada
- Vermont

Positive Incentives: APS Performance Incentives

- Funding for DSM
  - Base rates ($10 million per year) and
  - Through implementation of an adjustor (average of $6 million per year)
- APS recovers performance incentive for DSM program results
  - Share of the net economic benefits (benefits minus costs),
  - Maximum reward of 10% of DSM spending
  - Credits against test year base revenue requirement
  - Low income bill assistance
- APS was obligated to spend $13 million in 2005 on DSM projects.

Positive Incentives: Connecticut Performance Incentives

- Utilities managing conservation & load management programs are eligible for "performance management fees," tied to performance goals approved by the ECMB and DPUC, including lifetime energy savings and demand savings, and other measures
- Incentives are available for a range of outcomes from 70-130% of pre-determined goals.
- 2004 utilities collectively reached 130% of their energy savings goals, and 124% of their demand savings goals.
- Received performance management fees of $5.27 million
- 2006 joint budget anticipates $2.9 million in performance incentives.

Positive Incentives: Massachusetts Performance Incentives

- NSTAR
  - After-tax shareholder incentive of five percent
  - Level of performance bounded from 75 percent to 110 of design level performance
  - Regulatory finding: Incentives must be large enough to promote good program management, but small enough to leave almost all of the energy efficiency funds to directly serve customers

Positive Incentives: Minnesota Performance Incentives

- 1999 – Utilities receive a percentage of total net benefits when performance levels are met or exceeded
- Net Benefits are calculated by subtracting each utility's program costs from the avoided costs resulting from each utility's Conservation Improvement Plan (CIP) investment
- Avoided cost estimates ($/kw,$/kWh) saved remain constant for the duration of approved biennial CIP

Positive Incentives: New Hampshire Performance Incentives

- Two separate incentives
- Cost-effectiveness incentive
  - Utility must achieve Actual to Projected Cost-Effectiveness ratio of 1.0 or higher
  - Incentive is 4% of Planned Energy Efficiency Budget multiplied by the ratio of Actual Cost-Effectiveness to Planned Cost-Effectiveness
- Energy Savings incentive
  - Utility must achieve 65% of planned energy savings
  - Incentive is 4% of Planned Energy Budget, multiplied by ratio of Actual Energy Savings to Planned Energy Savings
- Maximum incentive in each sector (residential and commercial/industrial) is 12%
- Sectors are calculated separately

Positive Incentives: Nevada Incentives

- DSM Incentive: Bonus rate of return for DSM investments 5% higher than authorized rates of return for supply investments
- Critical Facilities Incentive: Facilities may be designated “critical” for reliability, diversity of supply- and demand-side resources, development of renewable resources, fulfilling statutory mandates and/or retail price stability
- Incentives for critical facilities may include:
  - Enhanced return on equity on facility over its life
  - CWIP treatment
  - Creation of “regulatory asset” account

Positive Incentives: Vermont Performance Incentives

- Incentive in effect for 2000-2002
- Efficiency is responsibility of Efficiency Vermont, the state's "Energy Efficiency Utility" (EEU)
- EEU receives performance incentives for meeting or exceeding specific goals in contract between Vermont's Public Service Board (PSB) and EEU
- Incentive categories:
  - Program Results Incentives (electricity savings &resource benefits)
  - Market Effects Incentives (significant market transformation)
  - Activity Milestones Incentive (exemplary performance for rapid start-up and/or infrastructure development)
- Incentives capped at $795,000 over three years

Resources

- Website: www.raponline.org
- E-mail:
  - Rapweston@aol.com
  - Rapwayne@aol.com
- MADRI Model Revenue Stability Rider
  - http://www.energetics.com/MADRI/pdfs/Model_Revenue_Stability_RateRider_2006-05-16.pdf
- RAP Efficiency Policy Toolkit:
  - http://www.raponline.org/Pubs/General/EfficiencyPolicyToolkit.pdf