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Revenue Regulation Options for New Hampshire

New Hampshire Energy Efficiency & Sustainable Energy Board

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About RAP – US

- RAP provides technical and policy support at the federal, state and regional levels, advising utility and air regulators and their staffs, legislators, governors, other officials and national organizations.
- We help states achieve ambitious energy efficiency and renewable energy targets and we provide tailored analysis and recommendations on topics such as ratemaking, smart grid, decoupling and clean energy resources. RAP publishes papers on emerging regulatory issues and we conduct state-by-state research that tracks policy implementation.

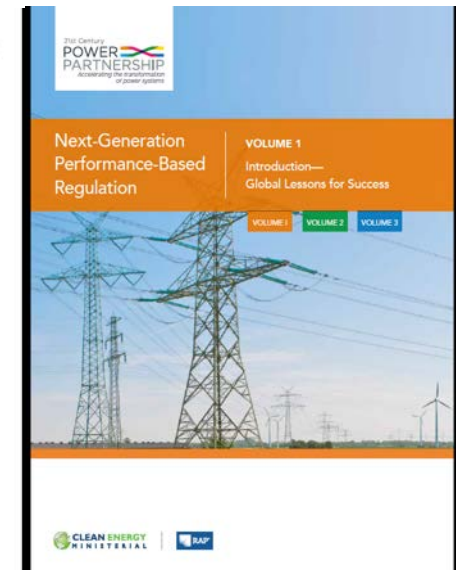
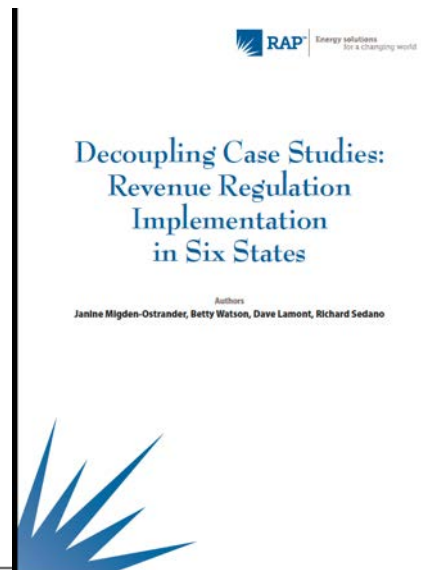
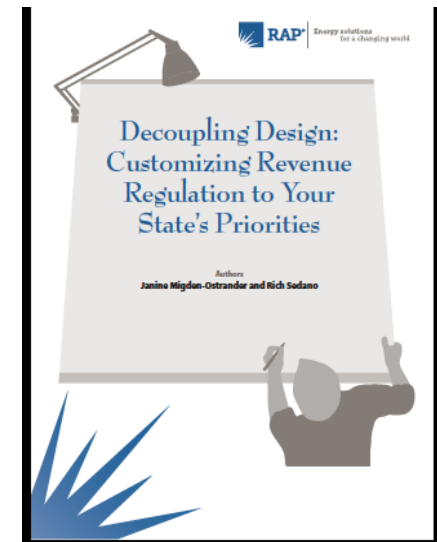
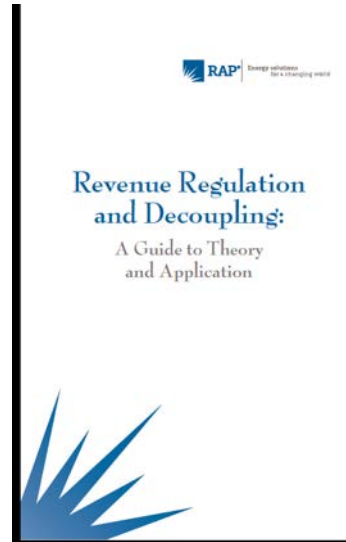
All regulation is incentive regulation

- The trick is to understand what the incentives are and how they affect behavior
- Traditional cost-of-service regulation often considered the baseline
 - Regulators set a price

Reconsidering Incentive Structures

RAP has written studies and worked with many PUC's on issues of revenue regulation, decoupling, performance-based regulation, and other tools to align incentives with public policy goals.

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Topics for Today

- Basics of Decoupling
- Consumer Benefits
- Key Design Choices

1 The Basics of Decoupling



How do utilities make money under traditional regulation?

- Under traditional regulation, regulators set:
$$\text{Price} = \text{Revenue Requirement} / \text{Projected Sales}$$
- But:
$$\text{Actual Revenues} = \text{Price} * \text{Actual Sales}$$
- Which means that:
$$\text{Net Income} = \text{Actual Revenues} - \text{Actual Costs}$$
- Utility makes money by:
 - Reducing costs
 - Increasing sales

The Throughput Incentive

- Traditional ROR regulation sets *prices*, not *revenues*
 - The revenue requirement is only an estimate of the total cost to provide service, used only as the basis for determining rates
- By themselves, consumption-based rates (\$/kWh and \$/kW) link revenues (and thus net income) to sales
 - The more kilowatt-hours a utility sells, the more money it makes
 - This is because, in most hours, the price of electricity is greater than the cost to produce it
 - Utility makes money even when the additional usage is wasteful, and loses it even when the reduced sales are efficient
- The incentive to increase sales is *extremely powerful*
 - This is the “throughput incentive”

How Changes in Sales Affect 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	\$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%

Revenue-Based Regulation or “Decoupling”

- Initial prices set the old-fashioned way in a rate case
- But now the amount of revenues that the company will receive is determined:
 - The “revenue requirement” becomes the company’s “allowed” (or “authorized” or “target”) revenue
- Differences between actual revenues and allowed revenues are trued-up through periodic rate adjustments
 - Monthly, quarterly, or yearly
- Other adjustments to revenue can be made
 - E.g., inflation, productivity, changes in numbers of customers, exogenous factors, rewards/penalties for performance, etc.

Purpose of Decoupling

- Breaks mathematical link between sales volumes and revenues
 - Makes revenue levels immune to changes in sales volumes
 - Enables recovery of utility's costs, including return on investment, in a way that doesn't create perverse incentives for unwanted outcomes
- Objectives:
 - **To improve economic efficiency**
 - Preserves utility's incentive to improve its operational efficiency
 - Net income remains a function of utility operations & management
 - Removes utility's incentive to increase net income by increasing sales
 - Shifts focus to customer service
 - **To reduce risk for both the utility and the customer**
 - Eliminates impacts (up or down) on revenue from weather, changes in the economy, and other exogenous factors
 - Likewise, eliminates impacts associated with least-cost actions

How Decoupling Works

Periodic Decoupling Calculation	
From the Rate Case	
Target Revenues	\$10,000,000
Test Year Unit Sales	100,000,000
Price	\$0.10000
Post Rate Case Calculation	
Actual Unit Sales	99,500,000
Required Total Price	\$0.1005025
Decoupling Price "Adjustment"	\$0.0005025

Key Variations

- Full Decoupling
 - All deviations from actual sales are included
- Partial Decoupling
 - Only a percentage of sales deviations are included
 - Can be linked to energy efficiency incentives
- Limited Decoupling
 - Only specific causes of sales changes are included in calculations
- Cost reconciliation for specific programs

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Consumer Benefits of Decoupling



Consumer Benefits of Decoupling

- Requires utility to refund to customer any excess revenues beyond those authorized by the Commission
- Removes a disincentive to for utilities to engage in energy efficiency as the least cost resource option. Energy efficiency:
 - Contributes to reductions in overall rate increases and
 - Provides tools for customers to reduce their bills
- Opens an opportunity to reduce revenue requirements
- Can be designed to achieve other public policy goals

Design Approaches to Protect Customers

- Symmetry: ensure that credits are provided to refund any overcollections
- Stability: cap on rate changes or bands around size of rate adjustment (e.g., plus or minus 3%)
 - Provisions for carry-over of over or under recoveries
- Lower revenue requirement: allows changes to overall cost of capital to reflect higher certainty of cost recovery

Decoupling and the Cost of Capital

- Earnings are more stable over time
- Reductions in utility return on equity to reflect reduced risk (e.g., 50 basis points)
- Changes to capitalization ratio to reflect risk reductions
 - Utility can carry a lower equity ratio and still protect bondholders from risk of insolvency
 - S&P: ~3% more debt for a utility with decoupling, for same bond rating
 - 3% more debt (and less equity) means about \$3+ million/year in lower revenue requirement per \$1 billion of rate base which results in more consumer savings

Illustration of Debt/Equity Ratio Shift

Without Decoupling	Ratio	Cost	Weighted with-tax cost of capital
Equity	48%	10%	7.38%
Debt	52%	7%	2.37%
Weighted cost			9.75%
Revenue requirement: \$1 Billion Rate Base			\$97,506.154
With Decoupling			
Equity	45%	10%	6.92%
Debt	55%	7%	2.5%
Weighted cost			9.43%
Revenue Requirement: \$1 Billion Rate Base			\$94,255,769
Savings Due to Decoupling Cost of Capital Benefit:			\$3,250,385

Related Policy Options

- Direct more energy efficiency/DERs
 - Decoupling conditioned on comprehensive programs and minimum energy efficiency requirements
- Direct more distribution efficiency
- Low income provisions
 - Rate design approaches
 - Refunds allocated to the first block; surcharges to tail block
 - EE programs directed towards LI
 - Can be combined with low-income assistance funds for more comprehensive approach

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Key Design Choices



Key Design Choices

- Are authorized revenues adjusted over time?
 - Overall revenue versus revenue per customer
- What about efficient increases in sales?
 - Beneficial electrification and reliability/outages
- What classes are covered?
- How are adjustments handled and accounted for?

Adjustments to Authorized Revenue

- Predetermined annual changes
- Formula-based changes
- “Attrition adjustments” – limited annual reviews
- Capital trackers
- Revenue per customer
 - Can distinguish between existing and new customers
 - Usage characteristics can vary greatly
- Hybrid approaches

Revenue per Customer Approach

From the Rate Case	
Target Revenues	\$10,000,000
Test Year Unit Sales.	100,000,000
Price	\$0.10000
Number of Customers	200,000
Revenue per Customer (RPC)	\$50.00
Post Rate Case Calculation	
Number of Customers	200,500
Target Revenues (\$50 x 200,500)	\$10,025,000
Actual Unit Sales	99,750,000
Required Total Price	\$0.1005013
Decoupling Price “Adjustment”	\$0.0005013

Existing vs. New Customers

Separate RPC for Existing and New Customers

	Existing Customers	New Customers	Total
Number of Customers	200,000	10,000	210,000
Revenue per Customer	\$50.00	\$45.00	
Allowed Revenues	\$10,000,000	\$450,000	\$10,450,000
Average Unit Sales	500	450	
Decoupled Price	\$0.100000	\$0.100000	
Collected Revenues	\$10,000,000	\$450,000	\$10,450,000
Average Customer Contribution	\$50.00	\$45.00	\$49.76

Beneficial Electrification

- If electrification is faster than expected, decoupling adjustments will be lower if all else is equal
- What is the relationship between costs and electrification?
- Decoupling limits short-run gain from electrification to electric utilities and provides larger benefit to customers
 - Baseline changes to authorized revenue can account for electrification
 - Performance and program incentives for electrification
- Different consequences to revenue per customer approach in electric and gas contexts

Reliability and Outage Restoration

- Revenue adjustments to account for outages
 - Revenue per customer per day
 - Exclusion of lost sales from major storms
- Service quality metrics and incentives
- Limits on decoupling adjustment provide a backstop

Rate Class Coverage

- Revenue from all customer classes can be considered together, with one decoupling adjustment for all customers
- Alternatively, decoupling can take place separately for each class or certain classes can be exempted
- Actions of individual large industrial customers can change actual utility revenue quite drastically
 - Risk can be distributed quite differently under different policy options

Handling Surcharges and Refunds

- Can be uniform across rate classes or differentiated
- Frequency of true ups can vary
- Carrying charges for deferrals
 - Risk-free rate
 - Weighted average cost of capital
 - Customer deposit rate

Rate Design Issues

- Surcharges/refunds can be incorporated into different billing determinants
- Opportunity to adjust rate design to send better price signals
 - Integration into inclining block rates or time-varying rates

Conclusion



The Basics

- Decoupling promotes economic efficiency
 - Stabilizes utility revenue over time
 - Reduces or eliminates a host of risks for both utility & customers
 - Eliminates a key financial barrier to utility support for customer-sited resources
 - Can reduce revenue requirement
- Decoupling elsewhere has worked well
 - “Now we can focus on customer service instead of worrying about revenue levels.”

The Details

- Numerous options to tailor decoupling to needs of New Hampshire
 - Adjustments to authorized revenue over time
 - Coverage of rate classes
 - Handling surcharges/refunds
 - Rate design
- Pitfalls can be avoided through decoupling design or integration into broader performance incentive framework

Decoupling Resources

- [Revenue Regulation and Decoupling: A Guide to Theory and Application](#)
- [Decoupling Case Studies: Revenue Regulation Implementation in Six States](#)
- [A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs and Observations](#)
- [Decoupling Design: Customizing Revenue Regulation to Your State's Priorities](#)
- [raponline.org](#)

About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org



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