RAP Energy solutions for a changing world

# The Basics of Decoupling: A Superior Solution to the Throughput Incentive

New Hampshire
Energy Efficiency and Sustainable Energy Board

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# Introducing RAP and Jim

- RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP staff have extensive utility regulatory experience. RAP technical assistance to states is supported by US DOE, US EPA and foundations.
  - Jim Lazar an economist and RAP Senior Advisor, was a consultant on utility rate and resource planning for 30 years.

# Outline

- The throughput incentive
- Why do decoupling
- Alternatives to decoupling
- How basic decoupling works
- Key choices in implementing decoupling

# If the Answer is Decoupling, What is the Question?

- Traditional regulation motivates a utility
  - to increase sales, and
  - to resist reducing sales
  - This is the '**throughput incentive**'

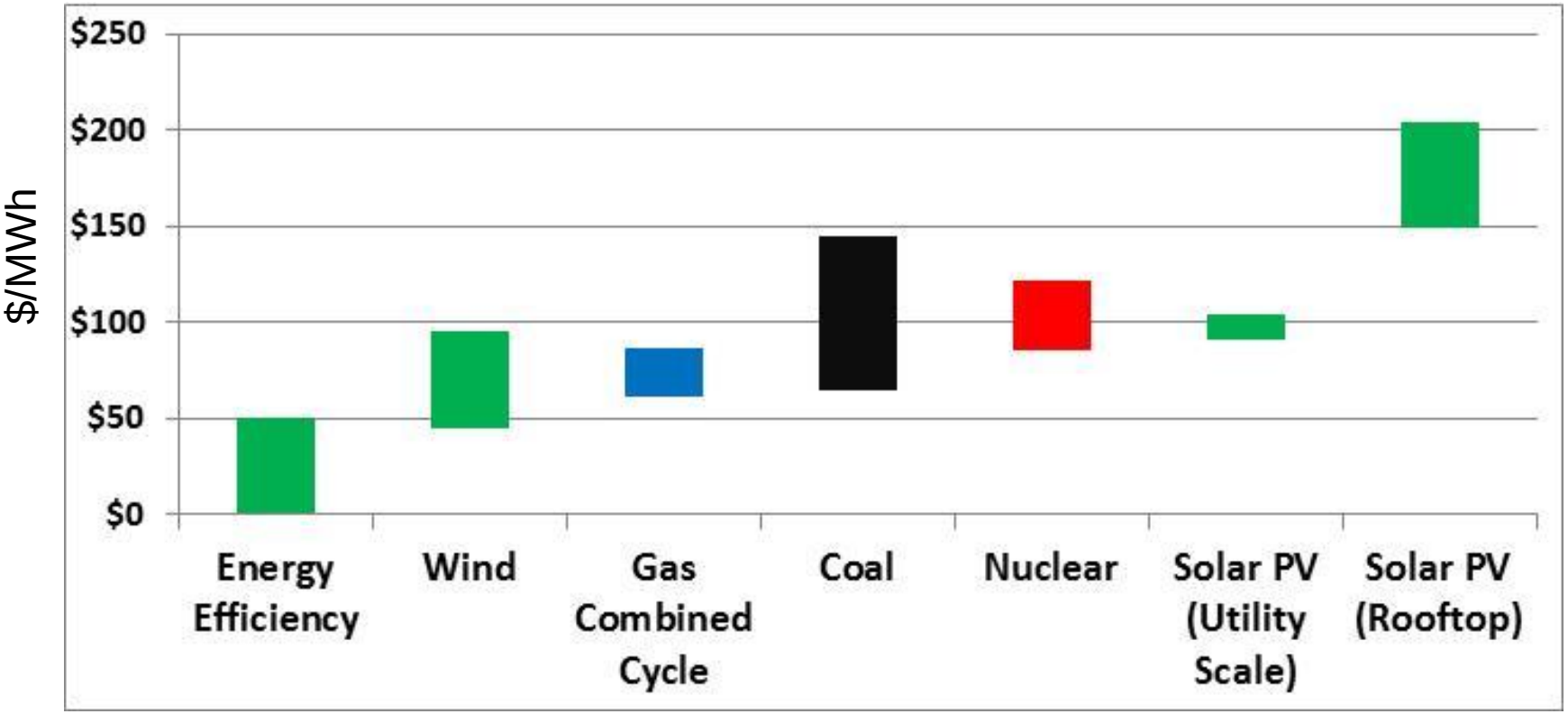
# How Changes in Sales Affect Earnings: It's Significant

| | 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% |

# Is There Something Wrong with the Throughput Incentive?

- There are many reasons why utility sales might go up or down, but **what should the utility motivation be**?
- Aligning utility incentives with the public interest to the maximum degree
  - Public interest appears to be in conflict with the throughput incentive
  - Aggressive energy efficiency is likely to be in conflict with the throughput incentive

# Energy Efficiency Is the Lowest Cost Resource




Source: Lazard, 2014

# Deeper: What's the Problem with the Throughput Incentive?

- Utility rate designs recover embedded investment and labor costs in the kWh charge
- If sales decline, revenue declines, if sales increase, revenue increases; these costs remain relatively constant.
- EE, DG, other policies reduce sales …
  - Not just what utility does, but markets do too
  - Plus other reasons sales change (weather)
- **Decoupling** is a tool to address the throughput incentive

# Alternatives and Complements To Decoupling

- Alternatives
  - Lost Margin Recovery
  - Weather-only Normalization
  - Shared Savings Incentive / Penalty Mechanisms
  - Fixed/Variable Rate Design

- Alternatives / Complements
  - Rate of Return Incentive
  - Third-Party Administration of EE Programs

# Lost Margin Recovery

Lost margin mechanisms attempt to measure the lost sales due to utility energy-efficiency programs, and provide recovery of the foregone margins.

**Positives**

- Eliminates utility profit attrition from EE programs
- Impact on customers easy to explain

**Negatives**

- Contentious to calculate
- May result in utility resistance to codes and standards.
- No measurable benefit to cost of capital

Example:  Hawaii, 1992 - 2007

# Weather-Only Normalization

A form of limited decoupling to reflect changes in usage due to weather only, not conservation or economic conditions.

**Positives**

- Easy to administer
- Achieves cost of capital benefits nearly equal to decoupling.

**Negatives**

- Does not address throughput incentive relative to energy efficiency

Example:  Brooklyn Union Gas Company

# Shared Savings Incentive / Penalty Mechanism

Divide the "net benefit" of EE investment between utility and consumers. Can be in place of or in addition to decoupling.

**Positives**

- Gives the utility a combination incentive to both achieve high levels of EE, and to do it at low total cost.

**Negatives**

- Difficult to explain; Complex to administer
- Utility share must be ~35% to cover lost margins

Examples:  Washington (PSE 2007-09)

# Fixed / Variable Rate Design

Set rates so that all distribution costs are recovered in a fixed monthly charge unrelated to usage. Charge can be different for different customer types (Single-family, Multi-family)

**Positives:**

- Simple to administer;
- Effective for utility earnings stabilization;
- Cost of capital benefits.

**Negatives**

- Causes usage prices to be far below long-run incremental cost, impairing economic efficiency
- Causes significant increases in customer usage
- Results in severe bill impacts for small-use consumers
- Undermines value of efficiency to consumer

Example: East Ohio Natural Gas

# Rate of Return Incentive

Allow utility a premium rate of return on energy efficiency investment, over and above that earned on general rate base.

**Positives**

- Creates a positive profit incentive for EE investment.
- Easy to explain to consumers.

**Negatives**

- Creates a positive incentive to invest, not to *conserve*.

Examples: Washington (1980-1990); Nevada (2007-2010)

# Third Party Administration of EE Programs

Delegating energy efficiency to a non-utility third-party provider puts programs in the hands of an entity without a lost-margin bias.

**Positives**

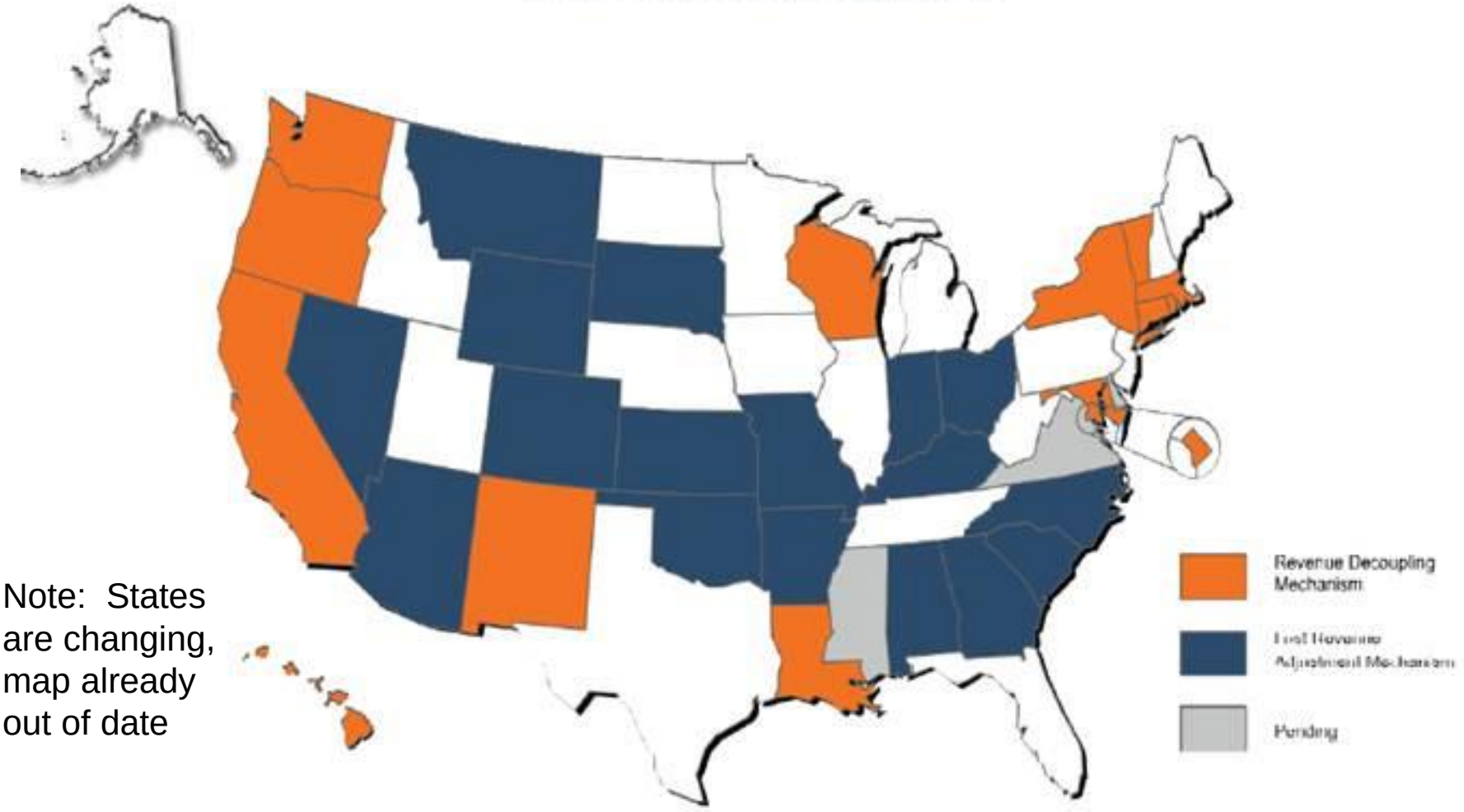
- Throughput incentive is irrelevant
- Performance has been very good
- Higher level of oversight is common

**Negatives**

- Lower level of coordination with T&D planning
- Utility still faces lost margins and rate case pressure

Examples: Efficiency Vermont; Energy Trust of Oregon

# Lost Revenue Adjustment & Revenue Decoupling Mechanisms for Electric Utilities by State




Note: States are changing, map already out of date

# What does decoupling do?

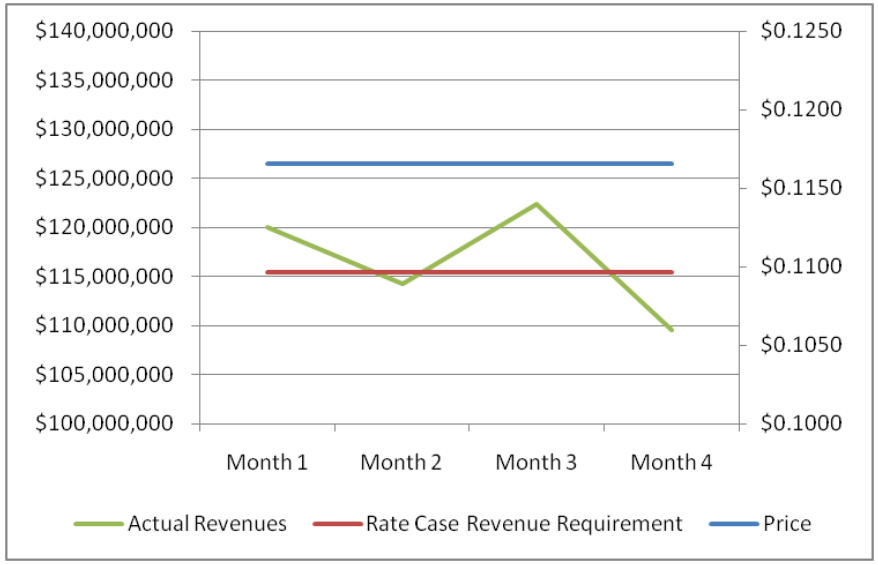
- Adjusts rates (prices) and usually revenues between rate cases
- Relies on found revenue requirement
- When sales deviate from rate case assumption, rate is adjusted to collect calculated revenue
  - Basis can reflect changes owing to trends or forecasted events, an added level of complexity

# Comparing Decoupling with Traditional Regulation

- Traditional regulation sets prices and lets revenues rise and fall with sales volumes
- Most distribution costs vary little in the short run with respect to sales
- If prices are set to recover distribution costs by volume, then lower/higher sales means lower/higher revenues (and profits)
- Decoupling resets revenues to recover target non-power costs by adjusting the price

# A Well-Designed Decoupling Mechanism Provides Predictable Revenue Independent of Sales

**Traditional Regulation:**
**Constant Price =**
**Fluctuating Revenues/Bills**




Revenues = Price * Sales

**Decoupling:**
**Precise Revenue Recovery =**
**Fluctuating Prices**


Price = Target Revenue ÷ Sales

# Simple Calculations: Basic Regulation

- Rate Base x Rate of Return = Return
- Return + Operating Expenses + Taxes = Revenue Requirement
- Revenue Requirement / Sales (kWh) = Rates ($/kWh)

# Traditional Rate of Return Revenue Requirement

- Rate Base (value of assets)
- x Rate of Return (set by PUC)
  - Debt and Equity (assume 50-50)
- = Return
- + Operating Expenses and Taxes
- = Revenue Requirement

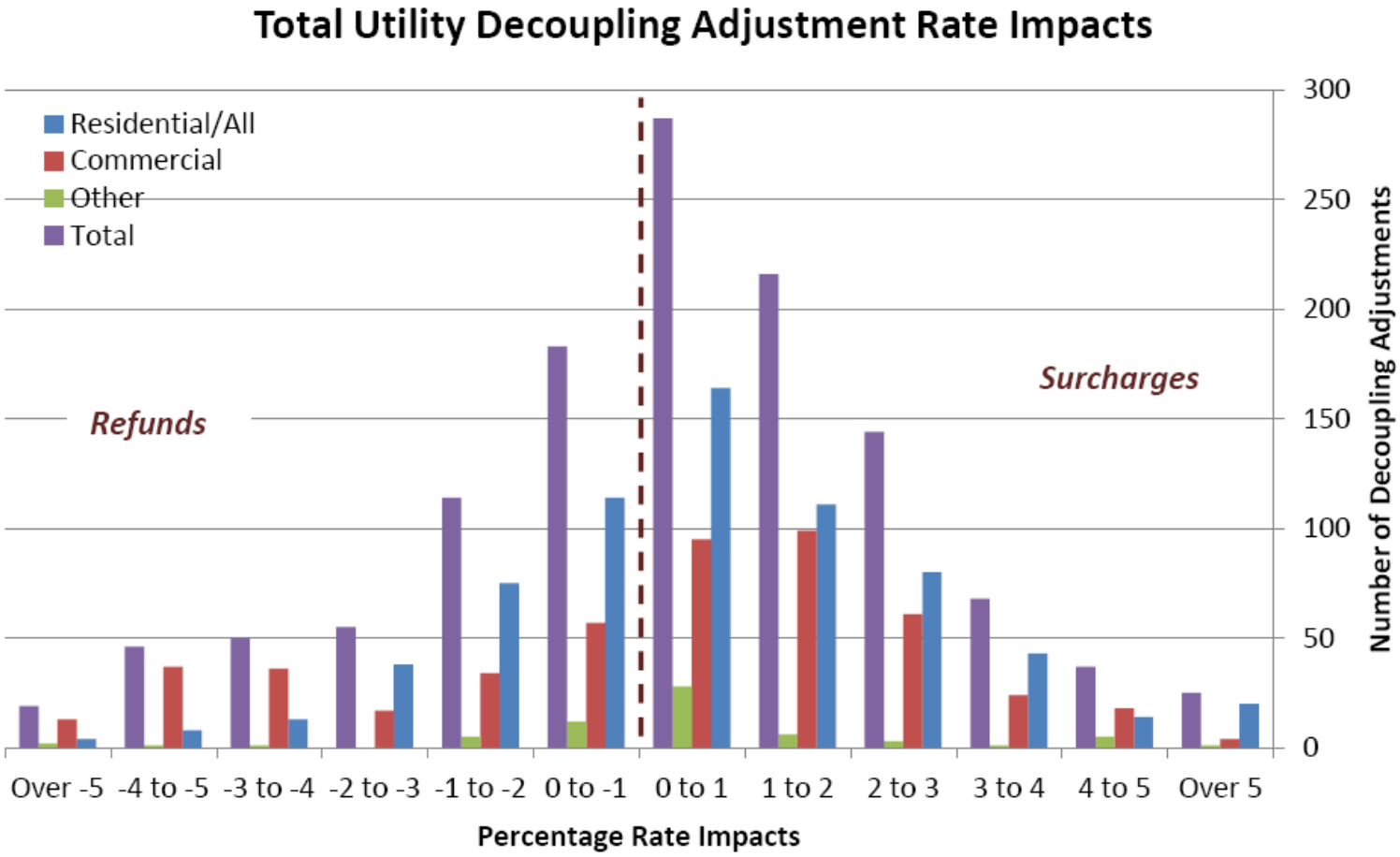
- $20,000,000
- x 8.0%
  - (10% for equity, 6% for debt)
- $ 1,600,000
- $ 8,400,000

- $10,000,000

# The Decoupling Calculation

| 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 | $ | 0.0005025 |

# Decoupling Rate Adjustments Have Generally Been Small




Pamela Morgan

# Design Goal for Decoupling

- Over time, utility revenues track what frequent rate cases would have produced
  - Note emphasis on revenues
  - Because over the term of the decoupling mechanism, non-power costs do not change that much
- Works best if decoupling becomes the norm

# Forms of Decoupling

- Revenue Per Customer
  - Commission allows a defined revenue per customer (by class) in rate case
  - As customer count grows, revenues grow
- Attrition
  - Commission allows defined revenue level in rate case
  - Each year, it reviews attrition factors, and adjusts the rate case allowance.

# Decoupling Downsides

- Rates change more frequently (generally by less than power costs) and outside of a general rate case
- Great success with EE and DG will increase rates, even as total costs may ⬇⬇
  - Note that EE participants tend to save far more than rates tend to rise
- PUC, others unfamiliar with decoupling
- Delays rate cases, which can be illuminating

# Some Consumer Protections for Decoupling

- Minimum EE Performance
- Symmetry of design
- Requirement of periodic rate cases to adjust rates
- Cap on rate increase amount permissible in any given year
- **Reductions in equity capitalization ratio to reflect reduced earnings volatility**

# Benefit of a One-Step Improvement in the Risk Profile

- S&P Indicates that a 1-step reduction in the Business Risk Profile means about a 3% lower equity capitalization ratio is needed to maintain the same bond rating.

## S&P Required Equity Capitalization

| Risk Profile | BBB Rating | A Rating |
|---|---|---|
| 3 | 35% - 45% | 45% - 50% |
| 2 | 32% - 42% | 42% - 48% |
| Difference | 3% | 2.5% |

# How a Lower Equity Ratio Produces Lower Rates

| Without Decoupling | Ratio | Cost | Weighted With-Tax Cost of Capital |
|---|---|---|---|
| Equity | 45% | 11.0% | 7.62% |
| Debt | 55% | 8.0% | 2.86% |
| | | | |
| Weighted Cost | | | 10.48% |
| | | | |
| Revenue Requirement: $1 Billion Rate Base | | | $ 104,800,000 |
| | | | |
| **With Decoupling** | | | |
| Equity | 42% | 11.0% | 7.11% |
| Debt | 58% | 8.0% | 3.02% |
| | | | |
| Weighted Cost | | | 10.13% |
| | | | |
| Revenue Requirement: $1 Billion Rate Base | | | $ 101,280,000 |
| | | | |
| Savings Due to Decoupling Cost of Capital Benefit: | | | $ 3,520,000 |

# A Lower Equity Ratio Does Not Mean A Lower ROE

A lower equity ratio still means the utility earns the same return on equity. It simply has fewer shares of stock (and more bonds) making up its capital structure.

# Why Not Leave The Equity Ratio Unchanged, and Let The Bond Rating Rise?

- Either one will produce the same effective results in the long run.
- A capital structure change can be implemented quickly, providing an offset to rising rates under decoupling and effective EE implementation.

# Decoupling Can Mean A Win-Win For All

- The investor receives the same return, more stable earnings, and a lower business risk profile.
- The consumer receives a lower revenue requirement.
- If weather decoupling is done in real-time (every billing cycle), the consumer also receives a lower bill in extreme weather, when bills are most difficult to pay.

# Some Decoupling Choices Regulators Are Asked to Make

- Apply to non-power costs or all costs?
- Frequency of rate adjustments?
- Limits on rate adjustments, disposition of deferrals
- Assessing the changing risk of the firm?
- Factor in weather?
- Allow revenue to change (per Customer, forecast)?
- Include industrial customers?
- Trigger for next decoupling mechanism?
- Overlay performance?
- What to do with earnings above and below target ROE?
- Other public interest progress

# Decoupling Resources

- Revenue Regulation and Decoupling: A Guide to Theory and Application
- Decoupling Case Studies: Revenue Regulation Implementation in 6 States
- A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs and Observations

# About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raponline.org

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