A Decoupling Foundation

Montana Public Service Commission Workshop on Decoupling

Presented by Richard Sedano

October 28, 2016
Introducing RAP and Rich

• 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.
  – Richard Sedano directs RAP’s US Program. He was commissioner of the Vermont Department of Public Service from 1991-2001 and is an engineer.
This Presentation

• Basics of decoupling
  – Why states do it
  – The calculations
  – Design principles
• Decoupling and Water Utilities
• Some Decoupling Experiences
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’
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 increasingly in conflict with the throughput incentive
  – An EERS is likely to be in conflict with the throughput incentive, PV adds conflict
Deeper: What’s the Problem with the Throughput Incentive?

• Utility rate designs recover fixed (investment and labor) costs in the volumetric charge
• Instability - If sales decline, profits decline, if sales increase, profits increase
• EE, DG, other policies reduce sales ...
  – Not just what utility does, but markets do too
• Decoupling is a tool to address the throughput incentive
# How Changes in Sales Affect Earnings

<table>
<thead>
<tr>
<th>% Change in Sales</th>
<th>Revenue Change</th>
<th>Impact on Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-tax</td>
<td>After-tax</td>
</tr>
<tr>
<td>5.00%</td>
<td>$9,047,538</td>
<td>$5,880,900</td>
</tr>
<tr>
<td>4.00%</td>
<td>$7,238,031</td>
<td>$4,704,720</td>
</tr>
<tr>
<td>3.00%</td>
<td>$5,428,523</td>
<td>$3,528,540</td>
</tr>
<tr>
<td>2.00%</td>
<td>$3,619,015</td>
<td>$2,352,360</td>
</tr>
<tr>
<td>1.00%</td>
<td>$1,809,508</td>
<td>$1,176,180</td>
</tr>
<tr>
<td>0.00%</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>-1.00%</td>
<td>-$1,809,508</td>
<td>-$1,176,180</td>
</tr>
<tr>
<td>-2.00%</td>
<td>-$3,619,015</td>
<td>-$2,352,360</td>
</tr>
<tr>
<td>-3.00%</td>
<td>-$5,428,523</td>
<td>-$3,528,540</td>
</tr>
<tr>
<td>-4.00%</td>
<td>-$7,238,031</td>
<td>-$4,704,720</td>
</tr>
<tr>
<td>-5.00%</td>
<td>-$9,047,538</td>
<td>-$5,880,900</td>
</tr>
</tbody>
</table>
At a High Level, What Does Decoupling Do?

• Decoupling is a regulatory mechanism to ensure that utilities have a reasonable opportunity to collect roughly the same revenues that they would under conventional regulation, independent of changes in sales volume for which the regulator wants them to be indifferent.
Gas and Electric Decoupling in the US

AUGUST 2014

Legend:
- Adopted Gas Decoupling (22)
- Pending Gas Decoupling (3)
- No Gas Decoupling (26)
- Adopted Electric Decoupling (17)
- Pending Electric Decoupling (4)
- No Electric Decoupling (30)
Electric and Gas Decoupling in the U.S. January 2016

LEGEND
- Adopted Gas Decoupling (23)
- Pending Gas Decoupling (4)
- No Gas Decoupling (24)
- Adopted Electric Decoupling (15)
- Pending Electric Decoupling (8)
- No Electric Decoupling (28)
Legality of Decoupling

• Some states ban changes to rates outside a rate case
  – This stops decoupling
  – Some states have clarified this in statute

• Some states have a longstanding assignment of discretion to the PUC to regulate utilities as appropriate
  – Allowing reconciliations in decoupling without an explicit statute
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
Revenue Regulation: A More Descriptive Term for What We Are Doing
Comparing Decoupling with Traditional Regulation

- Traditional regulation sets **prices** and lets **revenues** rise and fall with sales volumes.
- Most utility costs, other than power supply, vary little in the short run with respect to sales.
- If **prices** are set to recover non-power costs by volume, then lower/higher sales means lower/higher profits.
- Decoupling resets **revenues** to recover 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

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

Revenues = Price * Sales

Price = Target Revenue ÷ Sales
Simple Calculations: Basic Regulation (electric)

• Rate Base x Rate of Return = Return
• Return + Operating Expenses + Taxes = Revenue Requirement
• Revenue Requirement / Sales (kWh) = Rates ($/kWh)
The Decoupling Calculation

- **Utility Target Revenue Requirement** determined with traditional rate case
  - By class & by month (or other period coinciding with how often decoupling adjustment is made)

- Each future period **will have** different **actual** unit sales than Test Year

- The difference (positive or negative) is flowed through to customers by adjusting **Price** for that period (see Post Rate Case Calculation)

### Periodic Decoupling Calculation

<table>
<thead>
<tr>
<th>Periodic Decoupling Calculation</th>
<th>From the Rate Case</th>
<th>Post Rate Case Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Revenues</td>
<td>$10,000,000</td>
<td>Actual Unit Sales</td>
</tr>
<tr>
<td>Test Year Unit Sales</td>
<td>100,000,000</td>
<td>99,500,000</td>
</tr>
<tr>
<td>Price</td>
<td>$ 0.10000</td>
<td>Required Total Price</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ 0.1005025</td>
</tr>
<tr>
<td>Decoupling Price</td>
<td>$ 0.0005025</td>
<td></td>
</tr>
</tbody>
</table>

No change in target revenue
The Revenue per Customer Decoupling Calculation

- In any post-rate case period, the Target Revenue for any given volumetric price (i.e., demand charge or energy rate) is derived by multiplying the RPC value from the rate case by the then-current number of customers.

<table>
<thead>
<tr>
<th>Periodic Decoupling Calculation</th>
<th>From the Rate Case</th>
<th>Post Rate Case Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Revenues</td>
<td>$10,000,000</td>
<td></td>
</tr>
<tr>
<td>Test Year Unit Sales</td>
<td>100,000,000</td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>$0.10000</td>
<td></td>
</tr>
<tr>
<td>Number of Customers</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Revenue Per Customer (RPC)</td>
<td>$50.00</td>
<td></td>
</tr>
<tr>
<td>Number of Customers</td>
<td>200,500</td>
<td></td>
</tr>
<tr>
<td>Target Revenues ($50 x 200,500)</td>
<td>10,025,000</td>
<td></td>
</tr>
<tr>
<td>Actual Unit Sales</td>
<td>99,750,000</td>
<td></td>
</tr>
<tr>
<td>Required Total Price</td>
<td>$0.1005013</td>
<td></td>
</tr>
<tr>
<td>Decoupling Price “Adjustment”</td>
<td>$0.0005013</td>
<td></td>
</tr>
</tbody>
</table>
Rate Design Elements (Nothing New Here)

- Use a Customer Charge for customer specific costs (metering, billing)
- Use a Demand Charge (generally for larger customers) for costs that vary with peak demand
- Energy charge generally recovers most production, T&D/delivery costs
  - Full recovery in volumetric charges
  - Time, Usage sensitivity (inclining blocks)
Effect of Decoupling on Rate Design

• (this page left blank intentionally)
Decoupling and Rate Design

• Rate design is getting increased attention for the price signals sent to customers
  – Align price signals to public policy and efficient investment, including but not limited to traditional rate design practices
• Decoupling does nothing to interfere with price signal or allocation objectives, public policy orientation is consistent
A Well-Designed Decoupling Mechanism Provides Predictable Revenue Independent of Sales

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

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

Revenues = Price * Sales

Price = Target Revenue ÷ Sales
Decoupling and Power Costs

• Fuel part of power costs can be volatile
  – Not easily adaptable to decoupling
  – Fuel adjustment clause in wide use anyway

• Fixed part of owned generation costs are adaptable to decoupling
  – One of many decoupling design choices
Is There an Analog to Power Costs in Water Utilities?

• Throughput incentive: Yes to both
  – Decoupling enables efficiency
• Capital portion of costs: Higher for water

• Decoupling mechanisms can have reopeners or exceptions
  – Dealing with exogenous or huge effects
  – Large (lumpy) capital events in water systems
Analog to Natural Gas

- Throughput incentive: Yes to both
  - Decoupling enables efficiency
- Capital portion of costs: Higher for Gas
What Causes Net Revenue Instability?

- To encourage economic efficiency, rates should reflect long-run marginal costs, including societal costs like emissions.
- In the short run, utility expenses vary with short-run marginal costs.
- These may be VERY different from long-run costs.

In the long run, all costs are variable.

In short run, you incur or avoid market cost for power.
Full Decoupling

• All effects on sales reflected
  – Sales, weather, economy
  – Throughput incentive fully resolved

• Options to partially address the throughput incentive (but then it remains)
  – Normalizations
    • Weather (degree days)
    • The economy
Two approaches to Decoupling
(both start with rate case revenue requirement)

• Revenue per customer
  – Calculated by dividing rev reqmt by number of customers = RPC
  – Distinguish appropriate classes
  – Periodic Ministerial process: RPC x actual customers = new rev reqmt, then divide by actual sales = new rates
  – “K factor” option to account for identified trends and future changes

• Attrition
  – Periodic Evidentiary proceedings: what has changed, reset rev reqmt
  – Use actual sales and new rev reqmt to set new rate
  – Comfort needed in this “exception-based” process
Why RPC Might be Appealing

• In many utility systems, short term costs are correlated with customer counts
  – Especially in a territory that is not “built out”
  – It might be lumpy, but Δ customer count still representative of Δ fixed cost
What is this K Factor?
Why might the future be different from the past?

• Adjust for identified trends or forecasts that are likely to change the basis of the revenue requirement
  – Inflation -- Size of Households
  – Productivity -- Capital Budgets

• Can be applied to the revenue requirement
  – Or can be applied to the RPC

• Has a shelf life as long as the assumptions are reliable

• Decoupling 201 – balance value with complexity (first time out, keep it simple)
Decoupling Advantages

- RPC simple to administer, customizable
- Stabilizes utility revenues
- Utility focuses on costs it can control,
- Removes utility throughput incentive
  - Accommodating aggressive EE
  - Maintaining rate design as price signal
  - Focus on Policy Priorities? Service?
- Delay general rate case (and associated attention and expense) to when driven by underlying cost shifts (not by usage changes)
- Process ought to reveal priorities
Decoupling and Performance

• Decoupling does not promote:
  – EE, DG, etc.
  – It does remove sales-driven attitudes that utilities properly have in traditional system – “Enabling”
  – It can promote cost cutting

• Decoupling is compatible with a performance system
  – Build in public interest priorities (new)
  – Roll any rewards or penalties into periodic rate adjustment
  – Protect against disruptive cost cutting
Decoupling Downsides

• **Rates** change more frequently (generally less than power cost adjustment riders) and outside a general rate case

• Great success with EE and DG will increase **rates**, even as total costs may ↓↓↓
  – EE participants tend to save far more than **rates** tend to rise

• PUC, others are unfamiliar with decoupling

• Delays rate cases, which can be illuminating
How Does Decoupling Differ from Conventional Regulation

• Conventional Reg.
  – Set rates based on cost, and let the revenues flow as sales volumes change between rate cases.

• Decoupling
  – Set revenues based on cost, and let the rates flow as sales volumes change between rate cases.
A Well-Designed Decoupling Mechanism Provides Predictable Revenue Independent of Sales

Traditional Regulation:  
Constant Price = Fluctuating Revenues/Bills

\[ \text{Revenues} = \text{Price} \times \text{Sales} \]

Decoupling:  
Precise Revenue Recovery = Fluctuating Prices

\[ \text{Price} = \frac{\text{Target Revenue}}{\text{Sales}} \]
If There Will Be a Rate Case Every Year, Do We Need Decoupling?

• Do you want a rate case every year?
• Do you need a rate case every year?
• If you have a rate case every year, the rate and revenue results of each will be similar if each is done well
Frequent Rate Cases

- Having rate cases every year means utility will not keep extra revenue, “the margin,” from increased throughput very long
- But
  - Rate cases are expensive
  - Consume the time of your best thinkers
  - Decision-makers reacting, not looking ahead
  - Utility still has the throughput incentive
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
Decoupling Comes in Various Colors
Some Proposals to Solve our Problem are **Not** Decoupling
Decoupling is Not

• Straight fixed variable rate design
  – Shifting all short run fixed costs to the customer charge
Decoupling is not

• A lost revenue adjustment mechanism
  – That identifies revenues lost specifically due to consumer funded energy efficiency programs and restores that revenue
Third Party Administration of EE

• May address concerns about EE program design and delivery

• But does not address the motivation of the utility to support EE and DG or its motivation to load build
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 risk of the firm, WACC, what to do?
- Full, or Factor in weather?
- RPC, attrition, both, other revenue requirement $\Delta$s?
- Addressing changed risk profile of the utility*
- Include industrial customers?
- Trigger for next mechanism?
- Overlay performance?
- What to do with earnings above and below target ROE?
- Other public interest progress
From Pamela Morgan
Cost of Capital

• Path A
  – Let the markets tell us how firm risk has changed
  – Evaluate in next rate case
    • Be sure to use comparable group of utilities

• Path B
  – Take an adjustment to ROE right away
    • Downpayment on benefits
    • Generally works better in a settlement so utility can get something it wants
## Decoupling and Risk (path C)

<table>
<thead>
<tr>
<th>Without Decoupling</th>
<th>Ratio</th>
<th>Cost</th>
<th>Weighted With-Tax Cost of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>45%</td>
<td>11.0%</td>
<td>7.62%</td>
</tr>
<tr>
<td>Debt</td>
<td>55%</td>
<td>8.0%</td>
<td>2.86%</td>
</tr>
<tr>
<td>Weighted Cost</td>
<td></td>
<td></td>
<td>10.48%</td>
</tr>
<tr>
<td>Revenue Requirement: $1 Billion Rate Base</td>
<td></td>
<td></td>
<td>$104,800,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>With Decoupling</th>
<th>Ratio</th>
<th>Cost</th>
<th>Weighted With-Tax Cost of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>42%</td>
<td>11.0%</td>
<td>7.11%</td>
</tr>
<tr>
<td>Debt</td>
<td>58%</td>
<td>8.0%</td>
<td>3.02%</td>
</tr>
<tr>
<td>Weighted Cost</td>
<td></td>
<td></td>
<td>10.13%</td>
</tr>
<tr>
<td>Revenue Requirement: $1 Billion Rate Base</td>
<td></td>
<td></td>
<td>$101,280,000</td>
</tr>
<tr>
<td>Savings Due to Decoupling Cost of Capital Benefit:</td>
<td></td>
<td></td>
<td>$3,520,000</td>
</tr>
</tbody>
</table>
Decoupling Choices
Regulators are Asked to Make

- Making these choices in a public, transparent process helps to promote confidence that participants understand what the mechanism is doing, that there is a common understanding, that information is not being withheld, that priorities are built in, that there is value in moving from traditional regulation
Decoupling Comes in Various Colors
Advanced Decoupling Choices

• Use the K factor for trends and forecasts
  – i.e. The MacMansion effect, or Electric Vehicles, or structural cost $\Delta$ (i.e. transmission capital), or productivity

• In RPC, adjust customers for outages
  – Motivates low outage frequency and duration

• **Price** adjustments monthly, current (MD)
  – Conveys information to customers
Words Matter: Advantages of the Term “Revenue Regulation”

• Focus on revenue
• Focus on stabilizing revenue
• Avoids conflation of meanings attached to decoupling
• Juxtaposes with “Rate Regulation” to aid compare and contrast with a rate cap
• Juxtaposes with “Performance- or Incentive-regulation”
Communicating with Customers

• Answer: why are my rates changing?
  – With relevant policy context and trends
  – Transparency makes for clear messages
• How is decoupling changing utility priorities and decisions?
• How is utility performance?
  – Hopefully good news (improved mgmt focus)
• What do customers want (for future)?
• Is there coherence with policy goals?
How Does the “Utility of the Future” Happen?

• **Service** (not throughput) the priority
• **Customers**: service and resources
• Public Policy - driven
• Risk Management to manage cost
• Regulation focuses on value

• How can decoupling assist?
“… PGE does have the ability to influence individual customers through direct contacts and referrals to the ETO. PGE is also able to affect usage in other ways, including how aggressively it pursues distributed generation and on-site solar installations; whether its supports improvements to building codes; or whether it provides timely, useful information to customers on energy efficiency programs. We expect energy efficiency and on-site power generation will have an increasing role in meeting energy needs, underscoring the need for appropriate incentives for PGE.”
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 sector. 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

rsedano@raponline.org

The Regulatory Assistance Project (RAP)®
Beijing, China • Berlin, Germany • Brussels, Belgium • Montpelier, Vermont USA • New Delhi, India

www.raponline.org
Puget Sound: Recent Decoupling Approval

- RPC, applied to delivery costs (power has its own adjustment)
- Service quality mechanism pre-existed
- More EE, low income Wx and bill assistance
- K factor addressing historic utility cost ↗
- Rev reqmt stale, no change to rate design
- No EE performance
- Resolved other local issues
One Innovative Proposal
Tucson Electric - Arizona

- Annual decoupling adjustment
- Inverted seasonal residential rate design
- Any surcredits applied to initial block
- Any surcharges applied to end blocks

<table>
<thead>
<tr>
<th></th>
<th>Summer</th>
<th>Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Charge</td>
<td>$ 7.00</td>
<td>$ 7.00</td>
</tr>
<tr>
<td>First 500 kWh</td>
<td>$ 0.080</td>
<td>$ 0.073</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minus any decoupling credit</td>
</tr>
<tr>
<td>Next 2,500 kWh</td>
<td>$ 0.102</td>
<td>$ 0.093</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plus any decoupling surcharge</td>
</tr>
<tr>
<td>Over 3,000 kWh</td>
<td>$ 0.120</td>
<td>$ 0.113</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plus any decoupling surcharge</td>
</tr>
</tbody>
</table>