Performance-Based Ratemaking

Rhode Island
Utility Business Models Discussion

April 24, 2017

Tim Woolf
Synapse Energy Economics
Consultant for the Division of Public Utilities and Carriers
Outline

• Financial incentives under traditional ratemaking
  • Why consider performance-based ratemaking options?

• Performance-Based Ratemaking
  • Includes multi-year rate plans (MRPs).
  • Includes performance incentive mechanisms (PIMs).

• Multi-Year Rate Plans
  • Brief description.
  • What issues should Rhode Island address?

• Performance Incentive Mechanisms
  • Brief description.
  • What issues should Rhode Island address?
### Incentives Under Traditional Cost of Service Regulation

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Throughput Incentive</strong></td>
<td>- Much of the utility’s revenue requirement is generally recovered by volumetric and demand charges, which are dependent on usage.</td>
</tr>
<tr>
<td></td>
<td>- Creates an incentive to oppose anything that decreases sales (energy efficiency, distributed energy resources), even when these technologies can meet customer needs at lower cost.</td>
</tr>
<tr>
<td><strong>Capital Investments Incentive</strong></td>
<td>- Utility earns a return based on capital investments.</td>
</tr>
<tr>
<td></td>
<td>- Creates a financial incentive to increase rate base.</td>
</tr>
<tr>
<td><strong>Rate Case Incentive</strong></td>
<td>- Base rates are adjusted in occasional rate cases that occur as they are needed. The more financial attrition that a utility is subject to, the more frequently they will ask for rate cases.</td>
</tr>
<tr>
<td></td>
<td>- Frequent rate cases can erode the utility’s incentive to improve performance and contain costs.</td>
</tr>
</tbody>
</table>
## Cost of Service Regulation versus PBR (simplified)

<table>
<thead>
<tr>
<th>Regulatory Element</th>
<th>Cost of Service Regulation (COSR)</th>
<th>Multi-Year Rate Plans (MRPs) (The key element of PBR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of rate cases</td>
<td>As needed. (Typically determined by utility.)</td>
<td>Pre-determined, fixed period. (For example, 5 years).</td>
</tr>
<tr>
<td>Revenue adjustments between rate cases</td>
<td>No adjustments to base rates. (Some revenues are reconciled through riders.)</td>
<td>Attrition relief mechanisms. (For example, RPI-X.)</td>
</tr>
</tbody>
</table>
| Performance Incentive Mechanisms (One element of PBR, but also used in COSR) | If implemented at all, generally narrowly focused on safety, reliability, and customer service | • Traditionally focused on areas that may experience service degradation due to cost reductions  
• Increasingly designed to create incentives to achieve a broad set of desired outcomes. |
## Multi-Year Rate Plans: Overview

**Objective**
- Provide financial incentive for utility to increase efficiency and reduce utility costs. Reduced costs should ultimately benefit customers.

**Key Components**
- Rate case moratorium
- Attrition relief mechanism (ARM) provides automatic relief for increasing cost pressures, but is not linked to a utility’s actual costs
- Performance incentive mechanisms for reliability, safety, etc.

**Optional Components**
- Revenue decoupling
- Earnings sharing mechanism
- Efficiency carryover mechanism
- Cost trackers
Multi-Year Rate Plans: Issues to Address

• Will an MRP improve the Company’s financial incentives?
• How long should the rate case moratorium last?
• How to design the attrition relief mechanism?
  • Index based. For example: RPI-X.
  • Forecast based.
  • A hybrid.
• What costs to include in the attrition relief mechanism?
  • Expenses only (labor, O&M, etc.)
  • Expenses plus capital costs
  • TOTEX approach
• Earnings sharing mechanism?
• Efficiency carry-over mechanism?
• How do performance incentive mechanisms fit in with the MRP?
# Performance Incentive Mechanisms: Overview

## Objective
- Articulate specific regulatory goals
- Track performance
- Incentivize improvements

## Key Components
- Regulatory policy goals – identifying performance areas and outputs
- Metrics – detailed information regarding utility performance
- Targets – requirement to achieve specific goals
- Financial incentives – based on performance relative to targets

## Optional Components
- Scorecards
- Public reporting (e.g., websites)
PIMs: Issues to Address

Performance Areas
- System efficiency
- Distributed energy resources
- Network support services
- Environmental goals

Metrics
- Tied to policy goals
- Tied to inputs or outputs
- Defined clearly, easily measured, easily interpreted
- Reporting requirements

Targets
- Sources of data (historic, peer groups, other)
- Realistic, stretch, or other targets
- Balance the costs of the targets with the benefits

Financial Incentives
- Are financial incentives warranted
- Asymmetric versus symmetric
- Reasonable magnitude
- Units (ROE, basis points, dollars, shared savings)

Synapse Energy Economics
Appendix
## State Goals Dictate the Most Fitting Option

<table>
<thead>
<tr>
<th>Performance Improvement Goals</th>
<th>Openness to Regulatory Change</th>
<th>PBR Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Low</td>
<td>Maintain current ratemaking practice</td>
</tr>
<tr>
<td>Improved performance in specific areas</td>
<td>Low</td>
<td>Adopt PIMs for specific areas</td>
</tr>
<tr>
<td>General improvement in utility cost performance</td>
<td>Moderate to high</td>
<td>Adopt an MRP with only traditional PIMs</td>
</tr>
<tr>
<td>Support for DERs</td>
<td>Low</td>
<td>Adopt PIMs for DER or decoupling</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Adopt PIMs for DER and decoupling</td>
</tr>
<tr>
<td>Improved performance in specific areas</td>
<td>High</td>
<td>Adopt PIMs for DERs, an MRP, and decoupling</td>
</tr>
<tr>
<td>General improvement in utility cost performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support for DERs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Synapse Energy Economics
PIMs – Implementation Details
1. Identify areas of performance to track

**Traditional Goals**
- Safety
- Lower costs
- Reliability
- Power plant performance
- Customer service

**Resiliency**
- Customer engagement
- Customer-targeted services

**Flexible Resources**
- Smart grid
- Renewable energy
- Improved load factor
- DG
- Reduced emissions
- Reduced losses

**Environmental Goals**
- Energy efficiency

**Emerging Areas**
- Customer engagement
- Customer-targeted services
- Smart grid
- Renewable energy
- DG
- Reduced emissions
- Improved load factor
- Reduced losses

**Environmental Goals**
- Renewable energy
- DG
- Reduced emissions
- Improved load factor
- Reduced losses
# Traditional and Emerging Performance Areas

<table>
<thead>
<tr>
<th>Traditional Performance Areas</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>To indicate the extent to which service is reliable and interruptions are remedied quickly</td>
</tr>
<tr>
<td>Employee Safety</td>
<td>To ensure that employees are not subjected to excessive risks</td>
</tr>
<tr>
<td>Public Safety</td>
<td>To ensure that the public is not subjected to excessive risks</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>To ensure that the utility is providing adequate levels of customer service</td>
</tr>
<tr>
<td>Plant Performance</td>
<td>To indicate the performance of specific generation resources</td>
</tr>
<tr>
<td>Costs</td>
<td>To indicate the cost of supply side resources</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emerging Performance Areas</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Efficiency</td>
<td>To indicate the extent to which the utility system as a whole is being operated more efficiently</td>
</tr>
<tr>
<td>Customer Empowerment</td>
<td>To indicate the extent to which customers are participating in demand-side programs or installing demand-side resources</td>
</tr>
<tr>
<td>Network Support Services</td>
<td>To indicate the extent to which customers and third-party service providers have access to networks</td>
</tr>
<tr>
<td>Environmental Goals</td>
<td>To indicate the extent to which the utility and its customers are reducing environmental impacts, particularly related to climate change</td>
</tr>
</tbody>
</table>
2. Develop metrics

- Ensure the metric is tied to the policy goal and will provide useful information about whether the goal is being attained

- Define metrics precisely, using regional or national definitions where possible
  - Helps avoid contention, and facilitates comparisons over time and across jurisdictions

- Choose metrics that are easily measured and interpreted
  - Complex data analyses reduce transparency
## Examples of possible metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Purpose</th>
<th>Metric Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System load factor</strong></td>
<td>Indication of improvement in system load factor over time</td>
<td>System average load / peak load</td>
</tr>
<tr>
<td><strong>Line losses</strong></td>
<td>Indication of reductions in losses over time</td>
<td>Total electricity losses / MWh generation, excluding station use</td>
</tr>
<tr>
<td><strong>Demand response (DR)</strong></td>
<td>Indication of participation and actual deployment of DR resources</td>
<td>Potential and actual peak demand savings (MW)</td>
</tr>
<tr>
<td><strong>Distributed generation (DG)</strong></td>
<td>Indication of the technologies, capacity, and rate of DG installations, and whether policies are supporting DG growth</td>
<td>Number of customers with DG, MW installed by type (PV, CHP, small wind, etc.)</td>
</tr>
<tr>
<td><strong>Information availability</strong></td>
<td>Indicator of customers' ability to access their usage information</td>
<td>Number of customers able to access daily usage data via a web portal</td>
</tr>
<tr>
<td><strong>Time-varying rates</strong></td>
<td>Indication of saturation of time-varying rates</td>
<td>Number of customers on time-varying rates</td>
</tr>
</tbody>
</table>
3. Set performance targets

- Balance the costs of achieving the target with the benefits to ratepayers
  - What is the value of achieving the target? Customer surveys can help determine value to customers (e.g., is extra reliability worth the additional cost?)
  - What are the costs of achieving the target? Does the utility have a budget cap on how much it can spend to achieve the target? Will costs be automatically passed on to customers?

- Set a realistic target. Various analytical techniques can help:
  - Historical performance (if still relevant)
  - Peer utility performance (if inherent differences between utilities can be controlled for)
  - Frontier methods (measures technical efficiency of various firms)
  - Utility-specific studies (IRPs and engineering studies can be useful)

- Use deadbands to mitigate uncertainty around a target
4. Set Financial Rewards and Penalties

• Symmetric vs. Asymmetric

• Ensure a reasonable magnitude for incentive
  • Large enough to capture utility management’s attention
  • Should not overly reward or penalize utility

• Start with small incentives; increase only if necessary

• Use the best units:
  • ROE basis points (but can encourage maximizing rate base)
  • Avoided costs (but can vary too much)
    • Example: energy efficiency rewards tied to avoided costs of energy are volatile
  • Percent of base revenues
  • Percent of pre-tax earnings
PIMs – Potential Pitfalls
Pitfalls to Avoid

Undue rewards or penalties

• Excessive rewards (or penalties) undermine the whole concept of incentive mechanisms.

Example: Rewards Based on Avoided Market Prices

Incentives that are tied to market prices may fluctuate significantly and provide utilities with a windfall. *(E.g., Palo Verde nuclear incentives, which spiked during California’s electricity crisis.)*

• Potential solutions:
  • Use an incremental approach: start low and monitor over time.
  • Careful PIM design (e.g., shared savings, caps on financial incentives, other safety valves).
Pitfalls to Avoid

Costs Outweigh Benefits

- Value to customers of achieving target is less than the cost (including the cost of any shareholder incentives, regulatory cost, and project costs.)

  *Potential solutions:*
  - Set a cap on the costs that can be passed on to customers.
  - Ensure benefits are realized.

**Example:** Advanced Metering Infrastructure Incentive

Ensure customer savings are actually realized.

Shareholder incentives + actual project costs < actual customer savings
Pitfalls to Avoid

Unintended consequences
• An incentive for one performance area may cause the utility to under-perform in areas that do not have incentives.
  
  • *Potential solutions:*
    • Focus on performance areas that are isolated from others.
    • Be cautious of implications for other performance areas.
    • Consider implementing a diverse, balanced set of incentives.

Regulatory burden
• PIMs can be too costly, time-consuming, or too much of a distraction.
• Can be a problem for utilities, regulators, and stakeholders.
  
  • *Potential solutions:*
    • Streamline using existing data, protocols, and simple designs.
    • Reduce the amount of money at stake.

Example: Penalties for Energy Efficiency
Some states have found that implementing penalties for energy efficiency is not worthwhile, given the contentiousness of the proceedings.
Pitfalls to Avoid

Uncertainty

• Metrics, targets, and financial consequences that are not clearly defined reduce certainty, introduce contention, and are less likely to achieve policy goals.

• Potential solutions:
  • Carefully specify metric and target definitions, soliciting utility and stakeholder input where possible.
  • Adjust targets and financial consequences only cautiously and gradually so as to reduce uncertainty and encourage utilities to make investments with long-term benefits.

Gaming and Manipulation

• Utilities may have an incentive to manipulate results.

• Potential solutions:
  • Identify verification measures.
  • Consider using independent third parties (that are not selected or paid by the utility) to collect or verify data.
  • Avoid complex data analysis techniques that are difficult to audit and reduce transparency.

Example: California’s Customer Surveys
Key Take-Aways

• The goal is to improve performance cost-effectively
  • Ideally, both utility and customers should benefit
  • Cost should never outweigh value to customers
  • PIMs may be best coupled with MRPs to provide cost containment incentives

• Setting a good PIM can be difficult
  • Requires significant stakeholder engagement, discovery process, and lots of analysis
  • Good baseline data is vital

• Financial incentives might not be needed

• Better information = better results
  • A key benefit of PIMs (or metrics) is the ability to better understand what is happening on the system