Performance-Based Ratemaking

Dr. Mark Newton Lowry, Ph.D.
President, Pacific Economics Group Research LLC
Prepared for Berkeley Lab

NCSL Energy Supply Task Force
Spring Meeting

19 May 2022

This work was funded by the U.S. Department of Energy Office of Electricity under Contract No. DE-AC02-05CH11231
Disclaimer

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, or The Regents of the University of California. Ernest Orlando Lawrence Berkeley National Laboratory is an equal opportunity employer.

Copyright Notice

This presentation has been prepared for Lawrence Berkeley National Laboratory under Contract No. DE-AC02-05CH11231 with the U.S. Department of Energy. The U.S. Government retains, a non-exclusive, paid-up, irrevocable, worldwide license to publish or reproduce this document, or allow others to do so, for U.S. Government purposes.

Performance-Based Ratemaking
**COSR Under Stress**

Traditional cost of service ratemaking (COSR) is in the shop for a tune-up in many states today. For many utilities...

- Load growth slowed by demand-side management (DSM) and distributed generation (DG)
- Cost growth accelerated by need for capex and cleaner energy (and now inflation)

Under COSR, chronically unfavorable business conditions like these lead to frequent rate cases that:

- Raise the cost of regulation
- Weaken cost containment incentives

Utilities also have weak incentives to protect the environment.
New Regulatory Frameworks

Problems with COSR have spurred development of alternative regulation options, and some need legislative authorization

- Additional cost trackers to expedite cost recovery
- Formula rates\(^1\) (essentially, comprehensive cost trackers)
- Performance-based ratemaking (PBR)

These approaches have varied incentive properties.

\(^1\) The term formula rate is short for a cost of service formula that causes a utility’s revenue to closely track its own cost of service.
Performance-Based Regulation

PBR: Forms of alternative regulation intended to encourage better utility performance through stronger incentives

4 well-established approaches:

- Performance Metrics
- Revenue Decoupling
- Special Incentives for Underused Practices
- Multiyear Rate Plans (MRPs)
Basic PBR Approaches Often Combined
Performance Metrics

Performance metrics quantify utility activities in key areas.

Several potential uses in regulations

- **Metrics Only**
- **Metrics with Target**
- **Performance Incentive Mechanisms (PIMs)**

PIMs can strengthen utility incentives in targeted areas by linking revenue to performance using metrics.

Publicly available scorecards\(^1\) use multiple metrics to summarize utility performance.

\(^1\) See Ontario example in Appendix.
Uses of Metrics and PIMs

Target “holes” in regulatory system incentives

Alert utility to key concerns

- Areas of poor performance
- Emerging performance issues — such as system resilience and the functionality of advanced metering infrastructure

>>> Metrics and PIMs are the “utility infielder” of PBR
What Do Metrics and PIMs Target?

PIMs most commonly target:

- Reliability and customer service quality
- Energy efficiency

New performance metrics (sometimes called “policy” metrics) and PIMs address emerging issues challenges:

- Peak load management
- Quality of service to DG customers
- Greenhouse gas emissions
- Promotion of electric vehicles and space heating
- Equity issues
Special Incentives for Underused Practices

The Basic Idea

Utilities can be reluctant to use certain practices, such as those that:

❖ Are innovative but risky
❖ Limit utility investment opportunities

Special incentives can nudge utilities in the right direction.

Tools

• Trackers for costs of underused practices (e.g., DSM)
• Return on equity premium for capitalized costs of these practices
• Management fee
• Pilot programs and innovation funds (“Regulatory Sandbox”)
Multiyear Rate Plans

Key Components

• Reduced rate case frequency (e.g., 3-5 year rate case cycle)
• **Attrition relief mechanism** provides automatic relief for cost pressures but is *not linked to utility’s contemporaneous cost growth*

>>> Stronger cost containment incentives, streamlined regulation

• Trackers for some costs (e.g., energy and DSM)

Optional Components

• PIMs (e.g., for reliability, service quality and energy efficiency)
• Revenue decoupling
• Special incentives for underused practices (e.g., pilot programs)
• Flexibility to offer innovative rates and services
MRPs are popular in the U.S., especially for electric utilities.

Recent legislation encourages MRPs in NC and WA.

Regulatory systems in some states are called MRPs, but act more like formula rates due to fine-print reconciliation mechanisms (e.g., IL, MD, DC).

MRPs also are popular in Canada, Britain, Australia, and Europe.

Impetus there often comes from policymakers and regulators
Conclusions

PBR is an increasingly popular alternative to traditional utility ratemaking.

Higher ceiling than alternative approaches

Used in many parts of the United States and many foreign countries

Some forms of PBR require new legislation.

A good understanding of PBR fosters good PBR legislation.
Resources


Performance-Based Ratemaking
**Contact Information**

Mark Newton Lowry, PhD
Pacific Economics Group (PEG) Research LLC
[www.pacificeconomicsgroup.com](http://www.pacificeconomicsgroup.com)
44 East Mifflin St., Suite 601
Capitol Square
Madison, WI
608-257-1522
mnlowry@pacificeconomicsgroup.com

Lisa Schwartz, Berkeley Lab
[lcswartz@lbl.gov](mailto:lcswartz@lbl.gov)
Appendix
MRP Case Study: Xcel Energy - Minnesota

Plan term 4 years; rate case moratorium through November 1, 2019

Revenue Escalation

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>2.47%</td>
<td>1.97%</td>
<td>0.0%</td>
<td>1.65%</td>
</tr>
</tbody>
</table>

Cost Trackers

- Fuel & purchased power
- Transmission cost
- DSM expenses
- Renewable generation costs
- Environmental compliance cost
- Annual capital spending (refunds only)

Revenue Decoupling

Performance Metrics

Includes PIMs for reliability and customer service quality


Performance-Based Ratemaking
**Attrition Relief Mechanism Design Options**

ARM design is the biggest issue in most MRP proceedings.

ARMs may cap growth in rates (“price caps”) or allowed revenue.

Several well-established approaches

- **Indexing**
  
  e.g., \( \text{growth Revenue} = \text{growth GDPPI} - X + \text{growth Customers} \)

- **Forecasting**

- **Hybrid** (e.g., indexing for O&M revenue, forecast for capital)

\(^1\text{GDPPI} = \text{Gross Domestic Product Price Index} \)
## Ontario Scorecard Metrics

<table>
<thead>
<tr>
<th>Performance Outcomes</th>
<th>Performance Categories</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Focus</td>
<td>Service Quality</td>
<td>New Residential/Small Business Services Connected on Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scheduled Appointments Met On Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telephone Calls Answered On Time</td>
</tr>
<tr>
<td></td>
<td>Customer Satisfaction</td>
<td>First Contact Resolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Billing Accuracy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer Satisfaction Survey Results</td>
</tr>
<tr>
<td>Operational Effectiveness</td>
<td>Safety</td>
<td>Level of Public awareness [measure to be determined]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level of Compliance with Ontario Regulation 22/04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Serious Electrical Incident Index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of General Public Incidents</td>
</tr>
<tr>
<td></td>
<td>System Reliability</td>
<td>Average Number of Hours that Power to a Customer is Interrupted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average Number of Times that Power to a Customer is Interrupted</td>
</tr>
<tr>
<td></td>
<td>Asset Management</td>
<td>Distribution System Plan Implementation Progress</td>
</tr>
<tr>
<td></td>
<td>Cost Control</td>
<td>Efficiency Assessment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Cost per Customer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Cost per Km of Line</td>
</tr>
</tbody>
</table>

### Notes:
1. These figures were generated by the Board based on the total cost benchmarking analysis conducted by Pacific Economics Group Research, LLC and based on the distributor's annual reported information.
2. The Conservation & Demand Management net annual peak demand savings include any persisting peak demand savings from the previous years.
**Ontario Scorecard Metrics (continued)**

<table>
<thead>
<tr>
<th>Performance Outcomes</th>
<th>Performance Categories</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Policy Responsiveness</td>
<td>Conservation &amp; Demand Management</td>
<td>Net Annual Peak Demand Savings (Percent of target achieved)</td>
</tr>
<tr>
<td>Distributors deliver on obligations mandated by government (e.g., in legislation and in regulatory requirements imposed further to Ministerial directives to the Board).</td>
<td></td>
<td>Net Cumulative Energy Savings (Percent of target achieved)</td>
</tr>
<tr>
<td>Connection of Renewable Generation</td>
<td></td>
<td>Renewable Generation Connection Impact Assessments Completed On Time</td>
</tr>
<tr>
<td>New Micro-embedded Generation Facilities Connected On Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial viability is maintained; and savings from operational effectiveness are sustainable.</td>
<td></td>
<td>Leverage: Total Debt (includes short-term and long-term debt) to Equity Ratio</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Profitability: Regulatory Return on Equity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deemed (included in rates) Achieved</td>
</tr>
</tbody>
</table>

**Notes:**
1. These figures were generated by the Board based on the total cost benchmarking analysis conducted by Pacific Economics Group Research, LLC and based on the distributor's annual reported information.
2. The Conservation & Demand Management net annual peak demand savings include any persisting peak demand savings from the previous years.
Revenue Decoupling

Decoupling Basics

- Tracker and rider cause actual revenue to track allowed revenue closely.
- Thus, revenue (and earnings) are “decoupled” from changes in system use.
- Revenue adjustment mechanism escalates allowed revenue automatically (e.g., for customer growth).

Pro

- Eliminates “lost margin” disincentive for utility to embrace DSM and DG.
- No need for high fixed charges that harm small-volume customers.
- New rate designs that encourage efficient DSM and DG are less risky.
- Stabilizes and accelerates revenue growth, leading to fewer rate cases.

Con

- By denying utilities the margin from electrification of transportation and space heating, it weakens utility incentive to promote them.

Performance-Based Ratemaking
Revenue Decoupling Precedents: Electric

Map showing states with expired and current plans for revenue decoupling.
Productivity Growth of Central Maine Power Accelerated under MRPs
About Dr. Lowry

President, Pacific Economics Group Research LLC ("PEG")

• Active in PBR field since 1989
• Specialties: multi-year rate plans, PIMs, revenue decoupling, productivity and statistical benchmarking studies
• Recent clients: British Columbia Utilities Commission, Duke Energy, Hawaiian Electric, Lawrence Berkeley National Laboratory, Ontario Energy Board, Puget Sound Energy, Quebec Industrial Intervenors, Xcel Energy
• Former Penn State University energy economics professor
• PhD Applied Economics, University of Wisconsin