Performance Incentive Mechanisms

A Form of PBR that can Support NERP Goals

North Carolina Energy Regulatory Process

PBR Deep Dive Webinar

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Takeaways

• PBR is a powerful tool in the regulator’s toolbox – PIMs are one aspect of PBR
• PBR (and PIMs) should be guided by state goals
• Use measurable criteria and metrics
• Focus on outcomes
• Be willing to reassess and adjust mechanisms if needed
1 Brief Background
PIMs can target positive outcomes

- Timely installation of utility IT system roll-out
- Distributed generation interconnection
- Peak load reduction via demand response
- Increase customers enrolled in time-varying rates
- Water savings
- EV rate education and charging station deployment
Or penalize for negative outcomes

- Poor performing circuits
- Slow service restoration
- Cost overruns
- Customer service complaints
- Long interconnection queues
Part of a broader toolkit for accomplishing goals

NERP Goals:

- Reducing carbon
- Affordability
- Reliability
- Inclusive process
- Integrate DERs and other new services
- Utility efficiency and cost effectiveness
Basic Steps

1. Choose a guiding goal to evaluate
2. Understand status quo incentives
3. Identify measurable performance criteria
4. Identify metrics
5. Track outputs and outcomes
6. Assess a penalty or provide incentive payment, if desired
7. Assess whether PBR is helpful to meeting the guiding goal
Setting up Successful PIMs
Start With Metrics
Examples of Guiding Goals

- Make/keep energy affordable for customers
- Improve distribution system reliability
- Reduce GHG emissions
Understand Status Quo Incentives
Develop Measurable Performance Criteria

Performance Criteria Examples:
- Declining customer bills
- Reduced customer outages
- Declining carbon emissions in transportation sector
Create Metrics

Examples:
• Average monthly energy bills for residential customers
• Frequency & duration of customer outages (SAIDI/SAIFI/CAIDI/MAIFI)
• Utilization patterns at public EV charging stations
Importance of Metrics

- Allows Commission to establish and focus on highest priorities
- Creates transparency to measure utility performance
- Enables creation of targets and goals for utility performance
Track Outputs & Outcomes

• Inputs: measurements of effort
  • E.g., hours of labor, dollars of investment

• Outputs: measurements of what was produced or delivered
  • E.g., EE program participation rate, MWh savings

• Outcomes: measurements of impact or achievement (relative to goals)
  • E.g., reduced customer bills, improved reliability
3 Hypothetical Example
Basic Steps

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Cost-effective alignment of generation and load

Note, this is one of the “outcomes” identified by the MN PUC in their January 2019 Order establishing a performance incentive mechanism process. Docket #17-401.

Photo: Heidi Sandstrom
Status Quo

• What incentives exist for utilities to accomplish this? To use distributed solutions to meet system needs? Are there incentives for utilities to actively avoid distributed solutions?

• Ditto for innovative rate design or demand response programs that influence load shape?

• Do utilities currently facilitate efficient levels of DR?

• Do utilities currently evaluate non-wires solutions?
Performance Criteria: Increase Customer Participation in DR/load shape programs

Other performance criteria related to the goal:
- Better utilization of flexible loads (e.g. water heaters and EVs)
- Increase EE savings during peak hours
- Increase number of customers participating in time-varying rates
Establishing Metrics

• Are any DR or load shape programs currently being implemented? What are the recent results? Can a baseline of performance be established?
• What aspects does the utility directly influence?
• What kinds of related data are readily available and easily verified?
Metric Options

• Number and percent of customers (by class) enrolled in controllable thermostat or controllable water heater programs
• Available capacity of demand responsive load (MW)
• Peak demand reduction from DR programs (MW)
• Peak demand reduction from DR programs operated by third-parties (MW)
• Number of demand response events in the last year
4 Establishing Incentives
Basic Steps

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Methodologies for Incentive Mechanisms

- Incentives or penalties added to or subtracted from return on equity
- Lower rate of return (based on cost of debt, for example) with adders based on performance
- Payments for specific milestones instead of increased rate of return
- Shared savings (for example, for EE)
Design Principles to Consider

- For every performance measure, ensure that benefits exceed costs (including the incentive)
  - Reward or assign a greater value to performance that lower costs for customers.
- Balance amount of reward that will incentivize utility without over-compensation
- Reflect importance of achievement of policy goal
- Quantifiable benefit? Consider an incentive/penalty
- Non-quantifiable? Consider reporting-only metrics
- All of this relies on good baseline data and assumptions
No Deadband, Symmetric Compensation

- Based on a compliant result at the origin
- Utility wins or loses revenue based on performance
- Dollar for unit, no limits

Note pressure on measurement and verification of savings
Symmetric Deadband & Compensation

- Based on a compliant result around a deadband at the origin
- Utility wins or loses revenue based on performance
- Dollar for unit
- No limits

Note pressure on measurement and verification of savings

E.g., a range of outcomes around the origin might be expected under normal circumstances
One-sided Penalty

E.g., something we want to discourage, such as really bad reliability performance

- No upside
- Deadband from adequate performance
- Severe penalty for poor performance
Asymmetric Compensation

E.g. for bad outcomes we want to avoid, but where there might be some upside to incent.

- Upside
- Capped, for superior performance
- Deadband from adequate performance
- Severe penalty for poor performance

Interconnection times? Reliability?
One-sided Reward

E.g., if we want the total incentive to be small, at least for the time being
Hit the Target

E.g., a particular target we want to achieve, such as a positive benefit-cost ratio for a program.
Practices that can lead to difficulty

- Basing performance incentives on inputs (\$ spent)
- Rewards or penalties based on exogenous factors ex: weather, economic growth, etc.
- Unclear or uncertain metrics or goals
- Lack of clarity around measurement methodology
- Not understanding utility motivations
Energy Efficiency Funding
U.S. State of Washington, 1980

• 2% increased return on equity for energy efficiency investments
• Incentive to spend as much as possible on measures that save as little as necessary
• Maximizing incentive while minimizing lost revenue to utility
• An example of focusing on inputs (amount spent), poor operational incentives and metrics
Carte Blanche for Cost Cutting

Pacific Northwest Bell, 1986

5-year rate freeze, no restrictions on the cost-cutting methods

Result:

- Cut customer service
- 1-900 number for customer service
- Incentive to keep customers on hold

Photo by Quino Al on Unsplash
5 State Examples

PBR and Some PIMs
Illinois Tracking Metrics

• More than 60 metrics developed as part of a settlement agreement with ComEd, including:
  • Reduced GHG emissions (as measured through load shifting, peak reduction, reduced truck rolls)
  • Load served by distributed resources
  • Time to connected DERs to grid
  • Peak load reductions (from DR)
  • Customers enrolled in time-varying rates
  • Customer awareness of ComEd’s portal for viewing usage data

Adopted a System Efficiency Incentive

PIM is 45% of the net benefits (the remainder go to ratepayers) from annual capacity market savings as a result of actions to increase system efficiency:

- incremental BTM PV beyond forecasts,
- DR not eligible for existing incentives,
- incremental storage, or
- additional peak reductions from NWA’s or partnerships with third parties.
Rhode Island PUC National Grid Order

Metrics to be tracked that may become eligible for PIMs:

• Installed energy storage capacity
• CO₂ avoided through EVs
• Light Duty Government and Commercial Fleet Electrification
• Low-income and multi-unit apartment building EV charging sites
• Distributed Generation Interconnection
### Hawaii regulatory mechanisms

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>3 Year Rate Case Cycle</td>
<td>Metrics Reporting Requirements</td>
<td>EPS and EEPS Requirements</td>
</tr>
<tr>
<td>Revenue Decoupling (RBA Provision)</td>
<td>Backstop PIMs (SAIDI, SAIFI, Customer Service)</td>
<td>System Planning Requirements</td>
</tr>
<tr>
<td>RAM Attrition Relief Provisions (O&amp;M, Rate Base, Depreciation &amp; Amortization)</td>
<td>Demand Response PIM</td>
<td>Competitive Bidding Framework</td>
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<tr>
<td>Partial Revenue Cap (RAM Cap)</td>
<td>Renewable Procurement PIMs</td>
<td>Approval of Major Capital Projects, Fuel Contracts, and Purchased Power Contracts</td>
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<td>Major Projects Interim Recovery Mechanism</td>
<td>ECAC/ECRC Fuel Cost Risk Sharing Incentive</td>
<td>Approval of Rules and Standards</td>
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<tr>
<td>Earnings Sharing Mechanism</td>
<td>ECAC Generation Efficiency Incentive</td>
<td>Approval of Accounting Policies and Financing Arrangements</td>
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<tr>
<td>Major Projects and Baseline Projects Credit Mechanisms</td>
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</tr>
<tr>
<td>ECAC/ECRC and PPAC fuel and purchased power pass-through</td>
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Source: Hawaii Public Utilities Commission
Maryland’s behavioral demand response program

PBR to promote peak demand reduction

- Opt-out peak rebate program - $1.25/kWh rebate for energy reduction on Energy Savings Days with 24-hour notice.
- BGE may capitalize the operating expenses associated with Smart Energy Rebate (SER) program
- BGE could not recover any of the AMI costs, or earn the 9.75% return on equity on its smart grid program until the utility proved that the deployment had a positive benefit-cost.
- The SER program was instrumental in maximizing the AMI business case and ultimately recovering the costs ($687 million capex)
### SER Program Summary to Date

<table>
<thead>
<tr>
<th>Year</th>
<th># of Energy Savings Days</th>
<th>Eligible Customers</th>
<th>Average Bill Credit</th>
<th>Peak Demand Reduction (MW)</th>
<th>Total Bill Credits to Customers</th>
<th>% Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>4</td>
<td>315,000</td>
<td>$9.03</td>
<td>96</td>
<td>$7 M</td>
<td>82%</td>
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<tr>
<td>2014</td>
<td>2</td>
<td>860,000</td>
<td>$6.55</td>
<td>209</td>
<td>$5.6 M</td>
<td>76%</td>
</tr>
<tr>
<td>2015</td>
<td>4</td>
<td>1,020,000</td>
<td>$6.67</td>
<td>309</td>
<td>$15.5 M</td>
<td>81%</td>
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<tr>
<td>2016</td>
<td>3</td>
<td>1,074,000</td>
<td>$6.73</td>
<td>336</td>
<td>$11 M</td>
<td>71%</td>
</tr>
<tr>
<td>2017</td>
<td>2</td>
<td>1,095,000</td>
<td>$6.13</td>
<td>330</td>
<td>$6.1 M</td>
<td>74%</td>
</tr>
</tbody>
</table>

### SER Wholesale Market Benefits to Customers, 2013 to 2015

<table>
<thead>
<tr>
<th>Benefits from Peak Demand Reductions</th>
<th>Benefits from Energy Reductions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale Capacity Revenue</td>
<td>Wholesale Energy Revenue</td>
<td>$406 M</td>
</tr>
<tr>
<td>$46 M</td>
<td>$25 M</td>
<td></td>
</tr>
<tr>
<td>Avoided Capacity Cost</td>
<td>Avoided Energy Cost</td>
<td></td>
</tr>
<tr>
<td>$87 M</td>
<td>$9 M</td>
<td></td>
</tr>
<tr>
<td>Capacity Price Mitigation</td>
<td>Wholesale Energy Price Suppression</td>
<td></td>
</tr>
<tr>
<td>$234 M</td>
<td>$5 M</td>
<td></td>
</tr>
<tr>
<td>Share of Total</td>
<td>Total</td>
<td>100%</td>
</tr>
<tr>
<td>11%</td>
<td></td>
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</tbody>
</table>

Source: [https://info.aee.net/hubfs/MD%20DR%20Final.pdf](https://info.aee.net/hubfs/MD%20DR%20Final.pdf)
Consumers Energy DR Reconciliation (Case No. U-20164) (7/18/19)

- Tied to IRP goal of 49 MW/yr. incremental DR growth
- Fully meet target = 13% return on program O&M costs
- 2% of DR O&M for assessing DR in 5+ NWA solutions

*DR used as part of a non-wires alternative project earn an annual payment of 2%

Source: Michigan PSC
ConEd’s Brooklyn-Queens Demand Management Project
Localized DERs to Achieve Lowest Cost service

- Utility provided incentives such as direct payments to DER providers or customers
- Facilitated competitive procurements among DER providers
- Shared savings consisted of ratepayers avoiding additional distribution costs; Con Edison receiving some of these savings in the form of a ROE adder
Shared Savings Mechanisms as PIMs

- Incentivize utilities to explore alternatives, change thinking about preferred solutions
- Reward utility for reducing expenditures below a baseline (or projection)
- Utility retains some profit, returns remainder to ratepayers = shared savings
SSM in Fuel Adjustment Clauses

• Fuel adjustment clauses pass all fuel price volatility onto customers, reducing utility incentive to operate plants efficiently
• Partial pass-throughs or pass-throughs contingent on plant efficiency can create a shared risk and shared savings opportunity
  • E.G. New York required utilities to absorb part of fuel costs above forecast costs and allowed them to retain savings below forecast
• Utilities with modified FACs operate their plants more efficiently (9% more efficiently in one study)

6 Takeaways
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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.

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Questions

• What is one thing about PIMs that you learned from this presentation, which may be relevant to NC energy goals?
• What is one question you have about PIMs that you want to explore further?