Regulatory Responses to Economic Change in the Power Sector

MARC Annual Meeting, 2018
Kansas City, Missouri

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Utilities Incentives in Traditional Regulation
“All regulation is incentive regulation.”

Incentive Regulation from a State Commission Perspective
Remarks to the Chief Executive’s Forum
Incentives of Traditional Regulation and Rates

- Build and own to grow rate base
- Increase volume of sales and electricity usage to enhance profits
- Cut non-capital expenses
- Avoid disallowances
2 Incentives in Rate Design
Regulatory Assistance Project (RAP)

The shape of grids to come?

Conventional electrical grid
Centralised power stations generate electricity and distribute it to homes, factories and offices.

Energy internet
Many small generating facilities, including those based on alternative energy sources such as wind and solar power, are orchestrated using real-time monitoring and control systems.

Offices or hospitals generate their own power and sell the excess back to the grid. Hydrogen-powered cars can act as generators when not in use. Energy-storage technologies smooth out fluctuations in supply from wind and solar power.

Distributing power generation in this way reduces transmission losses, operating costs and the environmental impact of overhead power lines.

Sources: The Economist; ABB
Straight Fixed/Variable:

100% of Distribution System Classified as Customer-related
Basic Customer Method

ONLY customer-specific facilities classified as customer-related
## Comparing Methods

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Straight Fixed/Variable</th>
<th>Minimum System Method</th>
<th>Basic Customer Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poles</td>
<td>$10</td>
<td>$5</td>
<td>$-</td>
</tr>
<tr>
<td>Wires</td>
<td>$20</td>
<td>$10</td>
<td>$-</td>
</tr>
<tr>
<td>Transformers</td>
<td>$10</td>
<td>$5</td>
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<tr>
<td>Services</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
</tr>
<tr>
<td>Meters</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
</tr>
<tr>
<td>Billing</td>
<td>$2</td>
<td>$2</td>
<td>$1</td>
</tr>
<tr>
<td>Customer Service</td>
<td>$2</td>
<td>$2</td>
<td>$1</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$46</strong></td>
<td><strong>$26</strong></td>
<td><strong>$4</strong></td>
</tr>
</tbody>
</table>
Variable Peak Pricing in Oklahoma

OGE rolled out a dynamic pricing rate coupled with a smart thermostat to its residential customers a few years ago

- “Smart Hours” features variable peak pricing, or five levels of peak pricing depending on what day type it happens to be

Some 130,000 customers are on that rate today; they control their thermostat setting, not OGE

- Average peak load has dropped by ~40%
- Average bill savings amount to ~20% of the customer’s bill

Source: Brattle
Peak Time Rebates in Maryland

- Both BGE and PHI offer dynamic pricing rebates of $1.25/kWh to their customers in Maryland (~ 2 million households), and bid in the load reductions into the PJM market.

- At BGE, about 80% of its customers have taken advantage of the rebates and saved $40 million in utility bills since the program began in 2013.

- In 2015, BGE’s PTR customers showed an average demand reduction of 16.2%, up from 14.5% in 2014, and 13.7% in 2013.

- The Maryland Commission may authorize new pilots to be done with time-of-use rates.

Source: Brattle
Price Can Influence **When** EVs Are Charged

![Graphs showing time of charging patterns in Dallas/Ft Worth and San Diego.]

Dallas/Ft Worth  
(standard rates)

San Diego  
(time-of-use rates)

*Source: M.J. Bradley, 2017*
Typical EV Charge Pattern with TOU Rates
BMW Smart Charging with 40% Under Control

(Example assumes 40% control)

- Shift load to the afternoon to absorb solar generation
- Eliminate "timer peak"
- Follow wind spikes
- Eliminate charge during peak

Graph showing iCharge Forward Average Load Curve and Total Charge Management Curve from 6:00 AM to 3:00 AM.
3 “Bad” Incentives
Bad incentive structure incentivized the utility to spend a lot on measures that saved very little.
Carte Blanche for Cost Cutting

Pacific Northwest Bell

Result:

- Cut customer service
- Charged for customer service phone access
- Incentive to keep customers on hold

Photo credit: Quino Al on Unsplash
FERC Transmission ROE Policies

- To broadly improve transmission reliability and reduce congestion, FERC’s Order No. 679 awards the transmission utility a higher rate of return on equity for new transmission investment.
- There is no requirement to quantify the benefits of a given investment in relationship to overall costs.
4 What do well functioning incentives look like?
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; payments capped at the utility savings
- Shared savings consisted of ratepayers avoiding additional distribution costs; NY’s Con Edison receiving some of these savings in the form of a ROE adder
Denmark’s benchmarking model: outages / quality of delivery & efficiency
Danish Incentives for Reliability

Source: DERA (2009)
Efficiency Benchmarking in Denmark

Demark uses an Efficiency benchmarking model

**Goal:** To encourage the most inefficient Distribution System Operators (DSOs) to become as efficient as the top 10% of DSOs within a four-year period

**How measured?** Efficiency index comparing the actual cost incurred by a DSO in operating its grid with the costs incurred by an “average” DSO
6 Takeaways
Takeaways

• Recognize rate design is a powerful tool in the regulator’s toolbox
• Incentives can align utility, ratepayer, and public interests
• Regulation succeeds where it is clear, transparent at each step, and aligns incentives for utilities and customers
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.

Learn more about our work at raponline.org