Utility Business Models and Performance-Based Regulation

U.S. Climate Alliance

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Outline

• Background and History
• Utility Business Model Issues and Reform Efforts
• Designing Performance Metrics and Incentives
1 Background and History
In the Beginning…

- Early competition to provide electricity service started in cities in late 19th century
  - Related problems of natural monopoly, “wasteful competition” and monopoly pricing
  - Aesthetic and practical issues
- State regulation begins in early 20th century
  - Monopoly service territories
  - “Just and reasonable” rates
- Federal legislation and regulation fills an important role starting in the 1930s
  - “Interstate commerce” gap
  - Break-up of major interstate utility conglomerates
  - Expansion of rural service
Traditional Electric Utility

Majority of electric service provided by investor-owned utilities that owned generation, transmission and distribution assets in a single state
  - Significant minority of service comes from publicly-owned entities and co-ops
Cost-of-service ratemaking is predominant model
  - FERC Uniform System of Accounts
Wholesale sales in interstate commerce regulated by FERC
  - Sales to smaller utilities (e.g., munis and coops)
  - Purchased power agreements
  - Informal sales and trading
From the 1960s to Today…

• 1960-1980
  • Emergence of nuclear power and combustion turbines
  • Oil crises and beginning of federal environmental regulation

• 1980-2000
  • PURPA implementation
  • Introduction of energy efficiency programs and demand-side resources
  • Emergence of combined cycle generation
  • Restructuring and RTO/ISO formation

• 2000-2020
  • Major increase in fossil gas extraction from hydraulic fracturing
  • Repeal of Public Utility Holding Company Act of 1935 and proliferation of mergers
  • Emergence of utility-scale wind and solar, distributed generation, advanced meters and smart grid
To Infinity and Beyond...

- Massive increases in computing power and data storage capabilities
- High penetrations of variable renewable resources change operation and economics of electric system
- Energy management technology becomes cheap and widespread
- Electrification of transportation and heating brings challenges and opportunities
- Continued cost declines for clean distributed generation and energy storage
Decarbonized and decentralized!

A New Landscape

- Data ownership and protection
- Vastly expanded set of resource options
- Changing reliability risks
- New markets, programs and retail pricing structures
- New institutions and bureaucracies
- Massive conglomerates own local utilities
Utility Business Models and Reforms
How do we get a monopoly investor-owned utility to satisfy the public interest?

And not solely maximize shareholder value?
Why and how do we regulate utilities?

- Public policy goals
  - Efficient competition and control of monopoly pricing
  - Reliable provision of service
  - Societal equity (e.g., universal access and affordability)
  - Economic development
  - Environmental and public health requirements

- Principles for setting utility rates
  - Effective recovery of revenue requirement
  - Customer understanding, acceptance, and bill stability
  - Equitable allocation of costs
  - Efficient forward-looking price signals
Simplified rate-making process

**Determine revenue requirement**

- Net rate base
  - (Plant in service – depreciation reserve)
- Rate of return
- Depreciation expense
  - (Plant in service x depreciation rate)
- Operating expense
  - (Fuel + purchased power + labor + labor overheads + supplies + services + income taxes)
- Other taxes

= $ millions

**Allocate costs among customer classes**

- Residential
- Commercial
- Industrial
- Street lighting

**Design retail rates**

- Dollars per month
- Cents per kWh peak
- Cents per kWh off-peak
- Dollars per month
- Cents per kWh peak
- Cents per kWh off-peak
- Dollars per month
- Cents per kWh peak
- Cents per kWh off-peak
- Dollars per kW monthly
- Dollars per light per month
Issues with Traditional Monopoly Investor-Owned Utility Regulation

- Cost-plus revenue structure provides little incentive for cost control
- Throughput incentive means that increased sales lead to higher profits
- Incentive to make large capital investments but little incentive to operate reliably and efficiently
- Little incentive to utilize non-utility energy resources
- Many public policy goals are outside a strict scope of economic regulation
Wide World of Solutions

Ratemaking solutions

- Prudence review of investments and expenses
- Future test year or alternative rate base calculations
- Decoupling and “revenue regulation”
- Multi-year rate plans
- Earnings sharing mechanisms
- Adjustment clause (tracker) reform

Structural solutions

- Integrated planning
- Programs and procurements for non-utility resources
- Restructuring and competition
- Environmental regulations

Measuring and incentivizing performance has both structural and ratemaking aspects!
Designing Metrics and Performance Incentives
Measuring and Incentivizing Performance

- Informal regulatory monitoring and oversight
- Data reporting requirements – “metrics”
- Rankings and targets
- Financial performance incentives and penalties
Matching the Problem and Solution
Key Distinctions and Debates

- Program management versus overall utility management
- Inputs, outputs or outcomes
- Level of utility influence and control
- Penalties, incentives and distribution of risk and reward
Set Guiding Goals

Examples:

• Make/keep energy affordable for customers
• Improve distribution system reliability
• Reduce GHG emissions
Create and Track Metrics

Examples:
- Average monthly bills for residential customers
- Frequency & duration of customer outages
- Utility emissions? Electric sector emissions?
  Economywide emissions?
Financial Performance Incentive Options

- Return on equity bonuses or penalties
  - Still tied to rate base
- Incentives defined by $ amounts
  - Tied to program budget or net earnings
- Shared savings mechanisms
  - Baseline measurement can be difficult
Hard Issues

- Lack of clarity around measurement methodology or potential for gaming
  - Can the utility “juke the stats”?
- Question of utility control
  - What if a given metric is significantly influenced by weather or economic conditions?
- How much incentive is too much?
  - Costs and benefits of individual incentive or overall regulatory scheme?
- How big is the hurdle you need to overcome?
  - Need to understand value and drivers of existing behavior
A Package of Reforms

Pair positive-only performance incentives with reduction in baseline return on equity

*Overall revenue may actually decrease; but potential shareholder earning shareholders could grow commensurate with the additional risk shifted to utilities*
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