Cost of Service and Public Policy

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Session Overview

- Improving Utility Sector Performance
- Costs to Provide Service
- Uniform System of Accounts
- Public Policy Challenges
  - Independent Power Producers
  - Incentives for Distributed Generation
  - Incentives for Renewable Energy

Thinking about Improving Industry Performance

- Two Main Areas:
  - Reducing costs in providing service or enhance service provided
  - Ensuring that the prices paid (revenues collected) cover the cost of service.
- Work up from the end-use customer to follow the flow of money.
- If any link in the chain of money flows is broken, the industry performance can be jeopardized.
  - Money is needed to make the necessary investments and maintain the current infrastructure
- If any link in the chain of money flows is broken, the industry is perceived to be more risky which has cost consequences.
  - Higher interest rates or rates of return required to accept the risk
- If any link in the cost flows increases, it may be an indication of declining performance or an increase in uncontrollable costs

Costs to Provide Service

- Utility incurs costs in order to provide service
- Costs include day to day operations and maintenance of the system
  - Fuel costs
  - Personnel costs
  - Maintenance costs
- Costs also include the opportunity costs of the capital used to build the assets
  - Debt service
  - Return on equity

Capital Costs and SOEs

- Debate on whether state owned enterprises 'need' a cost of capital, as anything above operating expenditures is sometimes characterized as profit
- Recovery of opportunity cost of capital will increase rates
- Revenues may not even cover operating costs
- Depreciation often based on historical costs
- Need answers to several questions
  - How will infrastructure be maintained?
  - How will infrastructure accommodate growth?

Revenue Sufficiency

- If prices do not cover utility costs, then prices must be raised
  - Certain groups may be protected, but not everybody can be protected from price increases
  - Do not want to encourage uneconomic bypass
- If costs are not covered, then infrastructure deteriorates, outside suppliers may not be paid leading to lower levels of service
- Rates should be designed to reflect cost causality where possible
  - Voltage level, time of use, location, peak load
- Rate increases can be tempered by efficiency enhancements and cost-minimizing operations

Cost of Service and Customers

- No one likes high prices, but to a consumer, prices are almost always 'too high'
- Political pressure to keep prices low
- Cost of service is always paid by the people in the long run, but not always through their bill
- Revenue insufficiency leads to
  - Lower service quality, now or in the future
  - Inability to expand system
- Government subsidies lead to
  - Higher taxes
  - Fewer hospitals, schools, roads, etc.

Distribution, Metering, and Billing Costs

- Most costs drivers are fairly predictable
  - Personnel costs
  - Capital costs for poles, conductors, metering
  - Technical losses (as a percent of load)
  - Characteristics of service area
  - Required quality and reliability
- The most important cost drivers are controllable to some extent
  - Personnel costs
  - Capital costs for poles, conductors, metering
  - Technical losses (as a percent of load)
  - Non-technical losses

Transmission and System Operation Costs

- Fairly predictable costs drivers
  - Personnel costs
  - Capital costs for towers, conductors, metering
  - Technical losses (as a percent of load)
  - Characteristics of service area
  - Required quality and reliability
- Cost drivers that are controllable to some extent
  - Personnel costs
  - Capital costs for poles, conductors, metering
  - Congestion and re-dispatch costs
  - Technical losses (as a percent of load)
  - Non-technical losses

Electricity Generation

- Functions:
  - Generates power from fuel, water, or other resource for delivery to the transmission system
- Accounts for the largest share of costs in the electricity industry.
- Cost Drivers:
  - Technology vintage, cost, and reliability
  - Fuel cost and availability
  - How technology and fuel are used in combination
  - Scale at which technology is employed

Cost Profile Considerations

- Fuel use will depend on availability
  - Many countries have limited fuel availability
  - Precipitation is necessary for operation of hydro facilities
- Older technologies are not going to be as efficient as newer technologies
- Choices may be constrained by local situation or needs

Electricity Generation Costs

- The costs of engineering, planning, and construction can be predicted and controlled fairly well.
  - This is especially true for well known technology-fuel combinations.
- The cost and availability of fuel is not so easily predicted, nor is it controllable over a long period of time.
  - Fossil fuels such as oil and gas are governed by regional or world markets
  - Short-term uncertainty (price and volume) can be hedged through contracts
  - Coal, where available, has a tradition of more price certainty and predictability with long-term contracts the norm
  - Renewable resources such as water or wind are not always available or predictable and definitely not controllable

Implementing Reforms

- The question now becomes:
  - ***How do we reform so as to best facilitate needed improvements to provide reliable electricity service at the lowest possible cost to as many people as possible?***
- The point of reform is to facilitate improvements in industry performance
- "Reform the market" is not a goal, but it may be a means of achieving a goal

Uniform System of Accounts

- Distinct accounting treatment for every expenditure
- Standardizes methods and aids in reporting and decision-making
- Ensures that costs are accounted for consistently
  - Across the industry (comparing generation costs with generation costs)
  - Across time (comparing 2011 expenditures with 2012 expenditures)
- May differ from other financial reporting standards

FERC Uniform System of Electric Accounts

- 100–199 Assets and other debits
- 200–299 Liabilities and other credits
- 300–399 Plant accounts
- 400–432, 434–435 Income accounts
- 433, 436–439 Retained earnings accounts
- 440–459 Revenue accounts
- 500–599 Production, transmission and distribution expenses
- 900–949 Customer accounts, customer service and informational, sales, and general and administrative expenses

Sample System of Accounts Structure

Account 404: Amortization of Limited-Term Electric Plant

Account 405: Amortization of Other Electric Plant

Account 413:Expenses of Electric Plant Leased to Others

Account 421:Miscellaneous Nonoperating Income

Account 425: Miscellaneous Amortization

Account 111: Accumulated Provision for Amortization of Electric Utility Plant

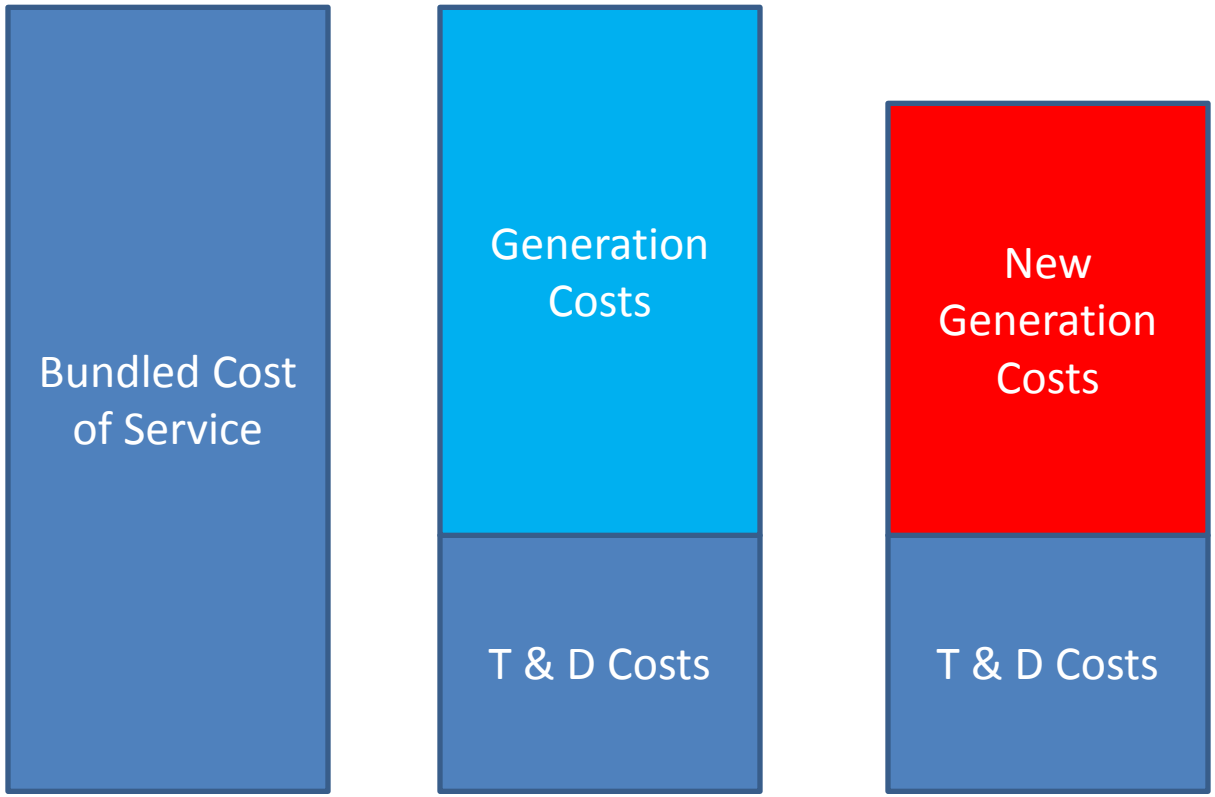
Roles in Determining USoA

- Government
  - Accounting and reporting requires a cost
  - Need to ensure that cost provides value to customers
- Regulator
  - Primary responsibility of regulator (e.g. transparency to investors, costs required to provide service)
- Utility
  - Typically has the best understanding of the availability of data

Introducing IPPs

- The introduction of Independent Power Producers is a common form of electricity market reform
- IPPs can provide generation diversity and cost savings to customers
- Important to understand exactly which costs are comparable to new producers

Price to Beat



Net Metering Incentives

- Used to encourage small scale generation
- May be able to implement this incentive without investing in new metering technologies

300 kWh

1000 kWh

Net Metering Policy Elements

- Eligible technologies
- Participation limits for the system or from individual customers
- Disposition of generation in excess of consumption
- Costs of necessary metering technologies of interconnections
- Ownership of any renewable energy credits

JEA (Florida) Net Metering Policy

JEA will furnish, install, own and maintain metering equipment at the installation point capable of monitoring the flow of power from JEA to the customer and from the customer to JEA. Bills will be developed by JEA at the close of each billing cycle based upon meter reads for that billing period. The billed kWh consumption for each billing period will be the amount of kWh received from JEA measured at the meter each month.

Net metering customers will be charged for the metered kWh delivered by JEA during each month. The customer always pays the monthly customer charge and the Retail Rate plus taxes and fees based on the kWh customer receives from JEA even if there is net zero consumption or net excess kWh exported to the grid during the billing cycle. In the net metering arrangement, excess kWh generated by the customer and sent to the grid will be credited at the prevailing applicable Retail Rate per kWh that is delivered to JEA during each billing cycle. Excess energy "generated" is the amount of energy generated by the renewable system over and above what the customer used and is sent back into the grid. This is not the total amount generated by the renewable system since some energy will be used by the customer.

The Cost of Public Policy

- Small scale generation usually only replaces the generation component
- Without regulatory intervention, costs associated with distribution may be subsidized by other customers
- Costs are more closely aligned with incentives by crediting project with generation costs only, but this requires meters that can read flows in both directions

Feed-In Tariffs (FITs)

- Guaranteed payment for specific technologies (primarily renewable) over a specified time frame
- Payment is typically greater than retail rate for electricity
- Can vary by technology

Kenya Feed-In Tariff

- KPLC as sole buyer
- 20 year term
- 300 MW of wind energy, 500 kW to 100 MW
  - 11¢ per kWh
- 250 MW of biomass, 500 kW to 100 MW
  - 10¢ per kWh
- 200 MW of small hydro, up to 10 MW
  - 8.25¢ to 10.5¢
- 500 MW of geothermal, up to 70 MW
  - 8 .8¢ per kWh
- 100 MW of biogas, 500 kW to 40 MW
  - 10¢ per kWh
- 100 MW of solar
  - 12¢ to 20¢ per kWh

Tariff Policy Decisions

- Meaning and importance of ‘least cost’ planning
- Responsibility for interconnection
- Buyer for electricity
- Restrictions based on technology
  - Advantages and disadvantages for rationing by technology
- Restrictions based on project size
- Tariff duration

1. The government of Kenya recognises that renewable energy sources (RES) including wind, biomass, small hydros, geothermal, biogas and solar and municipal waste energy have potential for income and employment generation, over and above contributing to the supply and diversification of electricity generation sources. The national energy policy as enunciated in Sessional Paper No.4 of 2004 and operationalized by the Energy Act No. 12 of 2006 encourages implementation of these indigenous renewable energy sources to enhance the country's electricity supply capacity. The Sessional Paper incorporates strategies to promote the contributions of the renewable energy sources in the generation of electricity.

CONNECTION OBLIGATIONS

79. The Feed-in-Tariffs include interconnection costs – transmission, substations and associated equipment - therefore grid system operators shall connect plants generating electricity from renewable energy sources specified in this document.

80. Where necessary, the grid system operator shall construct or upgrade its grid at a reasonable economic expense to facilitate interconnection. The interconnection costs including transmission/distribution lines and substations construction or upgrading shall be recovered by the grid operators from the Feed-in-Tariff.

South Africa Renewable Energy Auction

- Next phase of South Africa REFIT
- Fixed amount per kwh serves as a price ceiling only
- Suppliers bid to secure commitment to sell renewable energy
- Winning bids based on both price and potential for economic development

A Tale of Two FITs

- Kenya made the decision to control costs, and has not experienced the participation volume that they would have liked
- South Africa made the decision to encourage participation, but had to take steps to control costs
- Both countries accomplished their primary goals, accepting the limitations of the chosen policy

Conclusions

- There are many challenges facing utilities today
  - Improve efficiency
  - Integrate new sources of energy
- Knowledge of a utility's cost structure is critical in understanding these challenges
- Uniform system of accounts is an important tool to understand a utility's cost structure

Thank You!

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