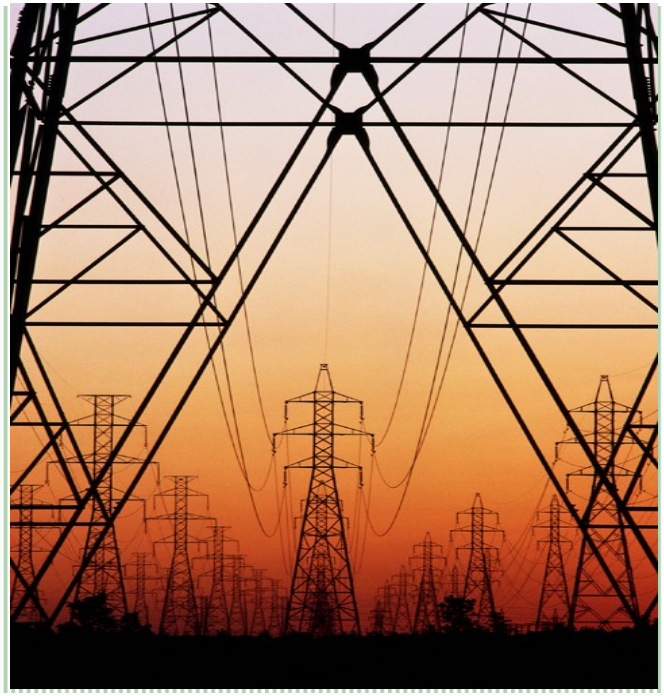

National Association of Regulatory Utility Commissioners' Energy Regulatory Partnership Program, The Energy Regulatory Office of Kosovo and The Illinois Commerce Commission

Overview of Price Regulation and Basic Ratemaking Process: Perspectives from Illinois

Commissioner Sherman J. Elliott

Illinois Commerce Commission

June10, 2009

The Regulatory Equation

- **Revenue Requirement = OC + r(V-D) + T + d + OSS**

- OC = Operating Costs
- T = Taxes
- d = Annual depreciation expense
- r = Rate of return
- V = Value of physical and financial capital
- D = Accumulated depreciation
- r(V-D) is called the “return portion” and V-D is called “rate base”
- OSS = Off System Sales

Setting the Period of Examination

- Test Year - Any 12 month period used for evaluating the revenues, operating expenses, depreciation, taxes, and rate base for purposes of setting rates.
  - **Current (or historical) Test Year** – A 12 month period which reflects the actual results of current operations could be adjusted for known and measurable changes.
  - **Future or Forecasted Test Year** - A future 12 month period which reflect the anticipated results of normal operations.

Adjustments

- Pro-Forma Adjustments – known and measurable changes

- Non-recurring expenses
  - One-time basis, irregular intervals
  - Amortized over the time period between rate cases

Determining Rate Base (V-D)

- How to determine rate base?
  - Net original cost (i.e., book) rate base (net means V-D)
  - Fair market value
    - Reproduction cost - the cost of duplicating the existing plant and equipment at current prices
    - Replacement cost - the cost of duplicating the old plant with the modern technology version

When to Measure Rate Base?

- End of period rate base - Value of the rate base at the end of the test year. This concept typically is used in conjunction with a current or historical test year.
- Average (normalized) rate base - Average rate base throughout the test (i.e., typical) year. This concept typically is used in conjunction with a future or projected test year.

Major Items in Rate Base

- Plant in Service
- Construction Work in Progress (CWIP)
- AFUDC
- Materials and Supplies
- Cash Working Capital
- Prepayments
- Typical Deductions:
  - Accumulated Depreciation
  - Deferred Taxes
  - Contributions in Aid of Construction

Introduction to Cost of Service

- Cost of service studies (COSS) are used to:
  - Attribute costs to different customer classes
  - Determine how costs will be recovered from customers within classes
  - Calculate costs of different services
  - Separate costs between jurisdictions
  - Determine revenue requirement between competitive and monopoly services
- General types of cost studies
  - Embedded (Test year accounting costs)
  - Marginal (Change in costs related to change in output)

Steps in COSS

- Obtain test year utility revenue requirement (generally an accounting/finance function e.g., USOA)
  - Other revenues (e.g., off-system sales, Hub sales, etc.)
  - Jurisdictional revenues/costs
- Determine customer classes
- Allocation of costs to cost-causers

Customer Class Determination

- Attempt to group customers together that have common cost characteristics, for example,
  - Size (volume and capacity)
  - Type of customer and meter (residential, commercial, industrial, electricity generation)
  - Type of usage (space heat, non-space heat etc.)
  - Type of load (firm, interruptible)
  - Load factor (average usage relative to peak usage)
  - Competitive alternatives (related to opportunity cost)

Embedded Cost Studies (ECOSS)

- Functionalize (production, distribution, transmission etc.).
  - For gas and electric utilities, functionalization is generally an accounting exercise (i.e., use USOA).
  - Exception: Electric transmission may need additional analysis (e.g., FERC seven factor test).
- Classification (demand-related, volume-related, customer-related, etc.).
- Allocation.
  - Direct assignment.
  - Allocator (demand, energy, customers, etc.).

Functionalization

- Electric and Gas utilities
  - Generation or gas production
  - Distribution (low voltage lines, low pressure mains)
  - Transmission (high voltage lines, high pressure mains)
  - Customer Service (costs associated with hooking up customers, meters, service drops, etc.)
  - General plant and administrative and general expenses (management costs, costs of buildings and offices, etc.)

Classification of Costs

- Costs are assumed to be related to demand, energy, customer or revenues.
  - Capacity costs (e.g., gas mains, generation plant, etc.) do not change as output changes, but do change as the capacity of the system changes. These are fixed costs that are generally classified as demand-related (i.e., related to kW or therm capacity).
  - Energy-related costs change with output (e.g., fuel). These are classified as energy-related or volumetric (i.e., related to kwh or therm throughput).
  - Customer-related costs (e.g., meters, services) change with the number of customers added to the system.
  - Revenue-related costs (e.g., revenue taxes) are related to the revenue received by the company.

Classification-Examples

- Generation Plant
  - Is generation plant entirely related to providing capacity?
- Gas mains or electric distribution
  - Are these costs solely demand-related or is there also a customer cost component (or are they solely customer-related)?

The Logic of Classification: Gas Distribution Mains

- What are gas distribution mains used for?
  - Meeting peak demand?
    - Historic and future planning parameters
    - Mains are sized to meet the highest peak demand on the peak day
  - Meeting average demand?
    - What evidence exists concerning the reason for investment (e.g., maintenance and replacement of existing mains)
  - Hooking up customers?
    - How does investment cost change with number of customers?

Allocation to customer classes of Demand-Related Costs

- Peak responsibility methods
  - Allocates capacity based on peak hour or some average of the peak hours
  - Customers who consume off-peak will not be allocated these costs
- Peak and average methods
  - Uses average and peak volumes weighted by the load factor
  - Recognizes that some investment is for not peak day needs

Types of Utility Tariffs

- Flat Watthour Tariffs.
- Declining Watthour Tariffs.
- Inverted Black Watthour Tariffs.
- Hopkinson (Two-part) Tariffs.
- Wright Tariffs (Load Factor Blocks).
- Dynamic Pricing Tariffs.

Flat Watthour Tariffs

- The Flat Watthour Tariff contains a energy charge that is unchanged with volume and a customer charge.
  - All components of electric supply (with the exception of the customer charge) are recovered through a watthour charge.
  - Implicit in this rate design is the assumption that the tariff class contains customers with relatively small variation in load factor, time of use and other important cost attributes.

Advantages and Disadvantages of Watthour Tariffs

- Advantages
  - Easy to bill.
  - Easy for customers to understand.
  - Requires simple metering technology.
- Disadvantages
  - Fails to capture differences in demand.
  - Fails to capture difference in time-of-use.
  - Requires that customers must be homogeneous.

Declining Watthour Tariffs

- The Declining Watthour Tariff has two blocks with the a reduced watthour charge for the second block.
- These tariffs are employed when the marginal cost to serve a customer is less than the average revenue requirement of the tariff.

Advantages and Disadvantages of Declining Block Rates

- Advantages
  - Simple for the utility to bill.
  - Simple for the utility to meter.
  - Fairly simple for customers to understand.
  - Appropriate when the average revenue requirement exceeds the marginal cost to supply customers.
- Disadvantages
  - Fails to capture differences in demand.
  - Fails to capture difference in time-of-use.
  - Requires that customers must be homogeneous.
  - Not appropriate unless average revenue requirement is less than marginal costs.
  - Can shift costs to smaller users.

Increasing Block Watthour Tariffs

- The Increasing Block Tariff is the opposite of the Declining Block Tariff – the last block of usage is billed at a higher charge.
- This type of rate design is appropriate when the average revenue requirement is less than the marginal cost to serve customers.

Increasing Block Tariffs – Advantages and Disadvantages

- Advantages
  - Simple for the utility to bill.
  - Simple for the utility to meter.
  - Fairly simple for customers to understand.
  - Appropriate when the average revenue requirement is less than the marginal cost to supply customers
- Disadvantages
  - Fails to capture differences in demand.
  - Fails to capture difference in time-of-use.
  - Requires that customers must be homogeneous.
  - Not appropriate unless average revenue requirement is greater than marginal costs.
  - Can shift costs to larger users.

Hopkinson (Two-part) Tariff

- The Hopkinson Two-Part Tariff contains explicit charges for energy and capacity (a Demand Charge)
  - Variants on this design may split the demand charge into a generation, transmission and distribution component).
- Components of cost that do not vary with electric power usage but rather electric demand usage is captured in the demand charge or charges.

Advantages and Disadvantages of Hopkinson Tariffs

- Advantages
  - Captures the differences in load factor form customer to customer.
  - Is generally understood by larger customers.
  - Provides explicit price signal to customers for both energy and capacity.
- Disadvantages
  - Requires more costly meters. The metering investment must be balanced with the benefits of implementing the tariff.
  - Requires more effort to bill.

Demand Charge Ratchet Mechanisms

- Demand Charge Ratchets are implemented on Hopkinson Tariffs for cost components which are established by the customer's highest demand in a series of billing periods (e.g., each year).
- Distribution charges often are good candidates for a demand ratchet.
  - The cost of the radial portion of the distribution system is established by the highest demand for an annual period even if the customer does not use that demand each month.

Advantages and Disadvantages of Demand Ratchets

- Advantages
  - Provides the customers with a better price signal regarding component costs.
  - Provides an additional mechanism for the unbundling of tariffs.
- Disadvantages.
  - More difficult for the customer to understand.
  - More difficult to bill.

Dynamic Pricing Tariffs

- Dynamic Pricing tariffs differentiate energy and capacity charges based upon the time of consumption.
- Dynamic Pricing tariffs can take many forms, from simple Time of Use tariffs to Real Time Pricing tariffs with rates adjusting hourly every day.

Advantages and Disadvantages of Dynamic Pricing Tariffs

- Advantages.
  - Provides a better price signal to the customer.
  - Moves the tariff to better matching of costs and revenues.
- Disadvantages.
  - Requires more costly metering equipment.
  - Is more difficult to understand.

Thank You!

- Questions?