Overview
- Objectives of Rate Design
- Steps in Setting Rates
- Cost Allocation
- Rate Design
- Special Rate Issues
- Policy Issues for Rate-setting

Rate Setting
- Rate setting is prospective
- Rates are set today to recover the future cost of service
- Development of the revenue requirement is largely a science
- Rate design involves significant element of art
- Rate setting may fulfill several objectives
- Cost of service practices have been in use since 1890's in US, but developments in information technology and metering may affect these practices
- Rate regulation is an act of government exercising social policy with the objective of enhancing social welfare

Bonbright’s Principles for Rates
- Principles of Public Utility Rates by James C. Bonbright
- Rate attributes: simplicity, understandability, public acceptability, and feasibility of application and interpretation
- Effectiveness of yielding total revenue requirements
- Revenue (and cash flow) stability from year to year
- Stability of rates themselves, minimal unexpected changes that are seriously adverse to existing customers
- Fairness in apportioning cost of service among different consumers
- Avoidance of “undue discrimination”
- Efficiency, promoting efficient use of energy and competing products and services

Rate Setting Objectives
- In Texas, rates should not be:
  - Unreasonably preferential
  - Prejudicial
  - Predatory
  - Discriminatory
  - Anticompetitive
- Rates must not embody unreasonable distinctions
- Rates should be just, reasonable, sufficient, equitable, and consistent

Steps in Setting Rates
- Establish utility’s revenue requirement
- Allocate revenue requirements to customer classes
- Design rates to recover revenue requirements
Rate Design or “How the Pie is Sliced”

- Determine Cost to Serve
- Total Revenue Requirement
- Allocate Costs to Classes

1. Functionalization
   - Step 1: What purpose does the cost serve for the utility?
     - Determine, for each item of rate base and expense, the functional use in the following categories:
       - Production (including purchased power)
       - Transmission
       - Distribution
       - General or Other
     - Accounting rules should be generally consistent with functions

2. Classification
   - Step 2: What causes the cost to be incurred?
     - Divides the costs, according to causality, into the following components:
       - Demand (Fixed costs that vary with kW demand)
       - Energy (Variable costs that vary with kWh provided)
       - Customer (Directly related to number of customers)
       - Investment in distribution plant to establish basic service
       - Metering, accounting, billing and customer service costs

3. Allocation
   - Step 3: How much of the total cost should each customer class pay?
     - Once costs have been functionalized and classified they are:
       - Directly assigned to a specific class if wholly attributable to a particular customer or customer class
       - Allocated to customer classes using appropriate allocation factors
     - Objectives or criteria to assess an allocation method:
       - Reflects cause (cost causation)
       - Reflects usage patterns
       - Produces stable results from year to year
       - Easy to understand by both regulators and customers
     - Accepted by regulators

Steps in Allocating Costs

- Input Data
  - Load & Customer Class Characteristics
  - Rate Base Relevant
  - Utility Operating Expenses

1. Functionalization
   - Functionalization of P, T, D, General

2. Classification
   - Demand Energy Customer Direct Assignment

3. Allocation
   - Functionalization
   - Energy Allocation
   - Customer Allocation
   - Direct Assignment

Assignment or Allocation of Costs

- Assignment or allocation of costs may be straightforward or very controversial
  - Straightforward
    - Energy costs allocated on energy consumption
    - Distribution costs are not assigned to transmission-level customers
  - Controversial
    - Allocation of investment costs of generating facilities is typically a difficult issue
Patterns of Consumption and Allocation

- Customer A's consumption varies during the day. Peak demand is 1,000 kilowatts (kW), and energy consumption is 14,400 kWh.
- Customer B's consumption is constant. Peak demand is 600 kW, and energy consumption is 14,400 kWh.
- Impact of coincident peak allocator:
  - Customer A: 62.5% of costs
  - Customer B: 37.5% of costs

Are Utility Rates Cost-based?

- For some costs, there may be competing methods proposed to allocate costs.
  - For demand, 3 CP vs. 4 CP vs. 12 CP.
- Class cost of service study is a view of the costs required to serve each class.
- Regulator may have reasons not to assign costs in accordance with study.
  - Government policy objectives favor a class or an objective (electrification).
  - Changing from existing to rates based on the study may result in a significant increase for some classes.

Designing Rates

- Uniform rates applied to groups of similar customers.
- Factors applied in designing rates:
  - Feasibility—what can be measured
  - Demand costs for residential customers recovered through energy charge
  - Stability
  - May use ratchets to spread seasonal costs over entire year
  - Cost causation
  - Ability of customers to understand charges
  - Marginal costs
  - Rates as incentives
  - Social objectives
    - Low-cost energy blocks

Typical Rate Designs in Texas

- Residential charges:
  - Customer charge (per customer per month)
  - Energy charges (per kWh)
  - Percentage of revenue charge (taxes)
- Industrial charges:
  - Customer charge (per customer per month)
  - Demand charges (per kW)
  - Energy charges (per kWh)
  - Percentage of revenue charge (taxes)

Policy and Practical Considerations Affect Rate Design

- Residential and small commercial energy charges include demand costs and may include customer-related costs.
  - Demand may not be metered
  - Social policies may favor minimum customer charge.

Energy Rate Designs: Flat Rate

- $0.20/kWh
  - 250 kWh = 250 x $0.20 = $50
  - 500 kWh = 500 x $0.20 = $100
Concepts Relating to Demand Charges

- Demand or load:
  - Rate of consumption at a specific time or over a time
- Demand on a utility system is the amount of energy consumed at a specific time
- Coincident peak demand (CP):
  - A customer's or customer class's demand at the time of a utility system's peak demand
- Non-coincident peak demand (NCP):
  - A customer's or customer class's maximum demand, regardless of when the system peak occurs
- Commercial and industrial customers may pay monthly demand charge based on their NCP
- Average demand:
  - The total amount of energy consumed during a period divided by the number of hours in the period
- Ratchets:
  - With a ratchet, customer is billed based on historical demand. Billing demand may be higher of:
    - Highest demand measured during the month
    - Some percentage (e.g. 80-85%) of the highest demand during the previous year (or in the peak season)
- Why use ratchets?
  - Stabilizes demand costs by spreading them over the year
  - Avoids disproportionately high charges during period with very high demand
  - Provides utility better revenue stability
  - Customers probably prefer rate stability
  - Informed customers understand significance of high demand

Special Rate Issues

- Volatile costs
- Marginal cost rates
- Extension of service
- Standby service

Mechanisms for Volatile Costs

- Fuel and purchased power adjustments:
  - Fuel or purchased power adjustment clause—utility adjusts charge monthly to reflect costs
  - May also include cost/revenue correction
  - Fixed factor—Regulator adjusts charge periodically to reflect expected costs
  - Utility files projected costs
  - Costs tied through formula to broad index, such as NYMEX
  - Interest to set from customers for imbalance in cost and revenue
  - Reconciliation of costs and revenues, review of reasonableness of costs and operating decisions
Marginal Cost Rates

- If long-run marginal cost is below embedded cost, utility may seek discounted economic development rate:
  - Rate above short-run MC (primarily fuel cost) but below embedded cost
  - To provide appropriate price signal, discounted rate should be above long-run MC.
  - Utility may prefer rate below long-run MC to provide disincentive to self-generation.
- What is the policy: encourage all industry, encourage industry that creates jobs, encourage or discourage self-generation.

Extension of Service

- Rates for installation of new service facilities:
  - Initial charges that cover high percentage of facilities costs.
  - Initial charges that cover low percentage of facilities costs but include contractual commitment to take service for period of years.
  - Initial charges that cover low percentage of facilities costs with no contractual commitment.
- What is the policy: encourage new service or provide assurance that utility will recover cost of new service.

Are There Broader Policy Issues for Rate-setting?

- Traditional rate-setting process is costly in time and resources, occurs relatively infrequently.
  - Between rate cases, utility has incentive to reduce costs, to maximize profit, if it has a period to enjoy above-normal profit.
  - Cost reductions may escape notice of regulator, without periodic monitoring.
  - Without special fuel or purchased power rate, utility may bear significant risk.
- Are we entering a period of instability in commodity costs that will strain rate-setting process?
- Does rate-setting process afford regulator opportunity to assess utility performance on other important issues, such as quality of service, energy efficiency efforts, or electrification?