Utility Rate Structure and Design

Florida Water Resources Conference
Rates 101 Workshop – Rate Structures
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Public Resources Management Group, Inc.
Utility, Rate, Financial and Management Consultants
Rate Design and Structures

- What is and why is Rate Design important?
- Rate Design Goals and Objectives
- Cost Allocation and Rate Design Overview
- Common Rate Structures
- Periodic Review of Rate Structures
- Resources
What is and Why is Rate Design Important?

**What is it?**
- How utilities allocate and recover costs from Customers

**Why is it important?**

<table>
<thead>
<tr>
<th>User Fees = Primary Source of Revenue</th>
<th>Costs / Rates Growing Faster Than Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing Affordability and Legal Challenges</td>
<td>F.A.C. Rates must be “just and equitable and uniform for users of the same class”</td>
</tr>
<tr>
<td>Fl. Water Permit Requirement – Conservation Promoting Design</td>
<td>Declining Average Water Use / Fixed Cost Recovery</td>
</tr>
<tr>
<td>Other Considerations:</td>
<td>Other Considerations:</td>
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<tr>
<td>· Bond Covenants: no free or preferential service</td>
<td>· Contractual Requirements (e.g., Wholesale Agreement)</td>
</tr>
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</table>
Rate Design Goals and Objectives

- Common Goals:
  - Fair and Reasonable
  - Recovers Cost of Service (present / future costs)
  - Promotes Efficient Use of Resources
  - Considers Affordability / Social
  - Targets Stable Rates and Revenues

- Rates Don’t Discriminate Against Any One Class or Type of Customer

- Equity Among Customer Classes (Vertical Equity)
  - E.g., Res vs. Com vs. Industrial

- Equity Within Customer Classes (Horizontal Equity)
  - E.g., Seasonal vs. Year-Round / Readiness to Serve

- Simple and Easy to Understand
Cost Allocation and Rate Design Overview

- **Fundamental of Rate Design Theory:** Link Costs to Causation

<table>
<thead>
<tr>
<th><strong>Functionalize Cost to Activity</strong></th>
<th><strong>Classify Costs by Service Characteristics</strong></th>
<th><strong>Allocate Cost Components to Rate Components</strong></th>
<th><strong>Allocate to Customer Class</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Common Methods:</strong> Base/ Extra Capacity Method Commodity / Demand Method</td>
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Cost Allocation and Rate Design Overview (cont.)

- Practical Issues in Rate Design:
  - Data Quality and Availability is Critical (i.e., Billing Records, Treated Flows, etc.)
  - Insufficient Detail of Operating and Asset Costs Can limit Rate Design
  - Metering is Often Monthly, Bi-Monthly or Quarterly; Identifying Peak Hour / Day Relationships Among Customer Classes Can be Difficult
    - New Automatic Meter Reading Technology
  - Simplified or Hybrid Approaches to Rate Design May be Preferred
Cost Allocation and Rate Design Overview (cont.)

- **Account Charge** = Meter / Billing / Customer Svc. Related Costs
  - Typically Charged Same to All Customers Per Bill
  - Meter Costs Increase with Meter Size

- **Base Charge** = Fixed costs associated with capacity, peak flow and/or strength
  - Common Practice to Apply Based on Meter Size

- **Flow Charge** = Fixed costs not in base charge + variable costs
  - Charged per Metered Unit of Flow (Inclining Structure Most Common)
  - Residential Wastewater Charges Can be Capped (reflecting indoor use)
Cost Allocation and Rate Design Overview (cont.)

- Evaluating Customer Impacts and Rate Design Implementation
  - Sample Residential and Commercial Accounts by Meter Size and Different Levels of Water Use
  - Customers Usage can Vary Over a Year / Examining 12 months of Bills Increases Understanding of Rate Design Impacts
  - Rate Phasing is Common Approach to Mitigating Customer Impacts
Common Rate Structures – Brief History

• 1960’s – Advent of Water Metering / Uniform and Declining Block Structures Common

• 1970’s – Conservation on Energy and Water Resulted in Questioning Declining Block Structures
  ▫ Public Utilities Regulatory Policies Act (PURPA) 1978 Required Electric Utilities to Justify Use of Declining Rate Structures

• 1990’s – Utilities start to Rethink Conservation Oriented Nature of Uniform Rates

• 1990’s - Today – Water Budget Rates and Other Rate Design Approaches are Gaining More attention as “Sustainability” is a Major Focus
Common Rate Structures (cont.)

- **Uniform Rates: (MOST COMMON WASTEWATER RATE STRUCTURE)**
  - Simple and Generally Equitable Since Customers Within Same Class Pay Same Unit Price

  - Customer Billing, Metering and Fire Protection Costs Recovered by Fixed Charge

  - Primarily a Variable Based Rate Structure

- **Decreasing Block Rate Structures**
  - Still Used in Other Parts of the Country
  - Does Not Promote Conservation
Common Rate Structures (cont.)

• **Increasing Block Structures:** *(MOST COMMON WATER RATE STRUCTURE)*
  - Common to Utilities with Supply or Infrastructure Constraints
  - Promotes Conservation / Reduces Revenue Stability
  - In Fl. Goal is to Target Irrigation or “Non-essential” use
  - Rate Design Theory and Cost Recovery Practices are Always Evolving
    - More Scrutiny to Inclining Block Rates Due to California and Prop 218
Common Rate Structures (cont.)

- **Increasing Block Structures: (MOST COMMON WATER RATE STRUCTURE)**
  - Design Should Link to Cost Causation; Design Assumes:
    - Utilities Sized for Peak not Average Demands
  - Peak Costs or Extra Capacity Requirements Linked to Increased Charges
  - Sometimes Avoided Capital Costs or the Higher Water Supply Costs are Allocated to Higher Tiers
  - Tiers Can be Linked to Level-of-Service (LOS) / E.g., 250 GPD = About 7,500 Gallons per Month
  - Most Commonly Applied to Residential Customer Class
Common Rate Structures (cont.)

- **Seasonal Rates:**
  - Addresses Seasonal Influx of Customers
  - Cost Allocation Links Costs of Heightened Peak Demand to In-Season Rates and Lesser Costs to Off-Season Rates
  - Appropriate for Utilities Faced with Substantial Fluctuations in Demand Around Seasons
  - Seasonal Rates Can be Considered Conservation Based Structure
Common Rate Structures (cont.)

- Water Budget Rates:
  - Form of Inclining Block Structure / 1st Tier Linked to Efficient Water Needs of an Individual (i.e., Indoor Use) Higher Tiers Linked to Inefficient Use (i.e., Outdoor)
  - Water Budgets Can Vary Throughout the Year Based on Weather or Other Factors
  - Requires Significant Data Management / Cost to Transition / Implement
  - Significant Cost to Implementation and Effort to Communicate to Customers
  - NOTE: Has Been Criticized as Ineffective in AWWA Peer Reviewed Article
    - Under Certain Circumstances Produces Lower Unit Costs in Summer than in Winter
      http://dx.doi.org/10.5942/jawwa.2012.104.0021
Common Rate Structures (cont.) Example

- Moulton Niguel Water District

\[ \text{ET} = \frac{\text{Persons per Household} \times \text{gallons per person per day} \times \text{days in billing cycle} \times \text{conversion factor}}{\text{Irrigable Area} \times \text{monthly evapotranspiration rate} \times \text{plant factor} \times \text{conversion factor}} \]

<table>
<thead>
<tr>
<th>Month</th>
<th>ET</th>
<th>Month</th>
<th>ET</th>
<th>Month</th>
<th>ET</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>2.17</td>
<td>February</td>
<td>2.80</td>
<td>March</td>
<td>3.72</td>
</tr>
<tr>
<td>April</td>
<td>4.80</td>
<td>May</td>
<td>5.27</td>
<td>June</td>
<td>5.40</td>
</tr>
<tr>
<td>July</td>
<td>5.89</td>
<td>August</td>
<td>5.58</td>
<td>September</td>
<td>5.10</td>
</tr>
<tr>
<td>October</td>
<td>4.03</td>
<td>November</td>
<td>2.70</td>
<td>December</td>
<td>2.17</td>
</tr>
</tbody>
</table>
Common Rate Structures - Nationally

- 2015 AWWA Rate Survey Findings

<table>
<thead>
<tr>
<th>Rate Structure</th>
<th>Water Service Providers</th>
<th>Wastewater Service Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat Charge</td>
<td>1%</td>
<td>13%</td>
</tr>
<tr>
<td>Uniform Rates</td>
<td>29%</td>
<td>66%</td>
</tr>
<tr>
<td>Decreasing-Block Rates</td>
<td>16%</td>
<td>6%</td>
</tr>
<tr>
<td>Increasing-Block Rates</td>
<td>50%</td>
<td>14%</td>
</tr>
<tr>
<td>Increase-Decreasing Block Rates</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Responses</td>
<td>296</td>
<td>214</td>
</tr>
</tbody>
</table>

- Median Water and Sewer Bills 3,750-7,500 Gallons Month
  - $21 - $32 Water Bill
  - $27 - $44 Sewer Bill
  - $48 - $76 Combined Bill

- Note: 30% of Respondents Indicated rates were not able or only slightly able to recover current costs
Common Rate Structures - Florida

• Rate Structure Types:
  ▫ Water Increasing Block Structure / Wastewater Uniform Rate
    • Most Common Increasing Block Tiers = 4-5

• Typical Residential Bill Ranging from 4kgal -8kgal
  ▫ $60 - $95 per Month
  ▫ Fixed Cost Recovery Around 35%

• Most / 60% of Utilities have Residential Wastewater Billing Cap
  ▫ 8kgal – 15kgal
Periodic Review of Rate Structure

- Why Periodic Review of Rates?
  - Assess If the Rate Design is Meeting It’s Overall Objectives
    - Are Pricing Signals Effective?
  - Customer Base and Demand Characteristics Change Over Time
  - Changing Trends in Billing Data Can be Indicator its Time for Review
  - Provide Assurance Rates are Reasonable and Equitable
  - New and Growing Technologies
    - New Hardware - AMRs
    - New Software – Live Communication of Water Use to Customers
Rate Design Resources

  - Recently Updated 7th edition released 2017

- Water Environment Federation (WEF) Manual of Practice No. 27 (MOP27)
  - Last Updated in 2004 / Update Scheduled Summer 2017

- Pricing Affordability of Water Services / EPA
  - https://www.epa.gov/sustainable-water-infrastructure/pricing-and-affordability-water-services

- Alliance for Water Efficiency / sustainable water finance
  - http://www.financingsustainablewater.org/about
Thank You