

# How Rate Setting Philosophies (Should) Shape Rate Structures

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# How do you Determine if your Rates are “Correct”?

# Examples of Common Objectives Supported by “Correct” Rates

Full cost recovery

Legality

Affordability

Fairness / Equity to different customers

Water use efficiency

Economic development

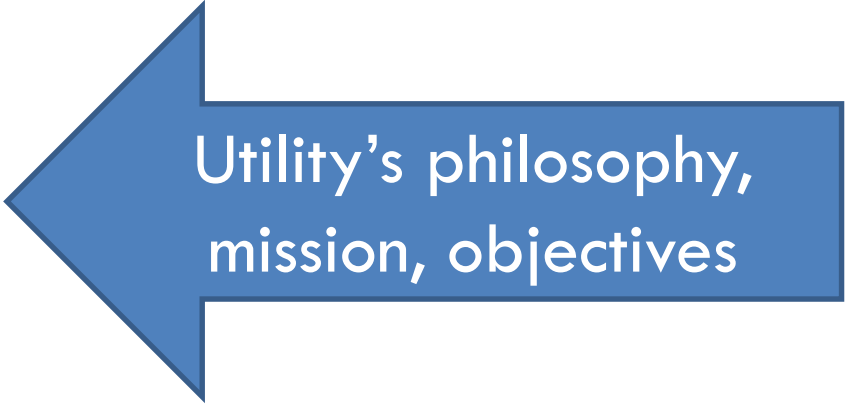
Revenue Stability

Resiliency

Others

# Two Elements to Consider While Setting Rates

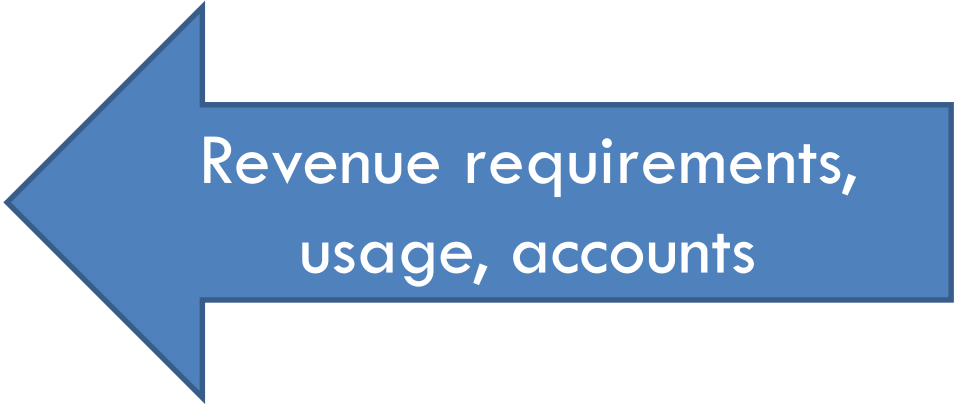
The rate structure design



Utility's philosophy,  
mission, objectives

and

The rates



Revenue requirements,  
usage, accounts



# Irvindale, USA Exercise

Small town with a water and wastewater system



Population: 1,100



Service Connections: 450



Projected Water Sales: 32,877,590 gallons



MHI: \$24,432

# Budget: Revenue Needs from W/S Rates

|    | Account                                  | Budget       |
|----|------------------------------------------|--------------|
| 1  | 30-329-00 W/S INTEREST EARNED DEPOS      | \$0.00       |
| 2  | 30-334-00 CONTRIBUTIONS/DONATIONS        | \$0.00       |
| 3  | 30-335-00 W/S MISC. REVENUE              | \$700.00     |
| 4  | 30-336-00 FUND BALANCE APPROPRIATED      | \$9,187.87   |
| 7  | 30-345-01 SALES TAX REFUND               | \$0.00       |
| 9  | 30-371-01 W/S CHARGES                    | \$344,445.00 |
| 10 | 30-371-02 W/S ADJUSTMENTS                | \$0.00       |
| 11 | 30-373-00 TAP CONNECTIONS                | \$1,500.00   |
| 13 | 30-373-02 SERVICE CHARGES/CUT OFFS       | \$12,500.00  |
| 14 | 30-373-04 IMPACT FEES                    | \$1,000.00   |
| 15 | 30-373-05 CAPITAL CONTRIBUTIONS          | \$0.00       |
| 16 | 30-374-00 Online W/S Payment Fee         | \$1,600.00   |
| 17 | 30-375-80 Contributed Capital - G.R.S.P. | \$0.00       |
| 18 | 30-375-81 Contributed Capital Fund       | \$0.00       |
| 19 | 30-377-00 RBEG - Pump Station            | \$0.00       |
| 20 | 30-378-00 I&I Study Grant - Commerce     | \$12,000.00  |
| 22 | 30-385-00 SALE OF ASSETS                 | \$0.00       |
| 23 | 30-386-00 TRANSFER FROM OTHER FUND       | \$0.00       |
|    |                                          | \$382,932.87 |

\$344,445

**“Correct” rates would generate \$344,445.**

**But there can be hundreds of rate structures that can produce \$344,445.**

# Philosophy 1: Payment for Access

“Customers should pay for having access.”

Extreme case: everyone pays the same amount for access to the system, regardless of how much water they use.

# Philosophy 1: Payment for Access

$$\frac{\$344,445}{450} = \frac{\$765.43}{12} = \$63.79$$

## Rate Structure: \$63.79/month

# Philosophy 2: Payment for Consumption

“Customers should pay for what they use.”

Extreme case: everyone pays only for the volume of water received.

# Philosophy 2: Payment for Consumption

$$\frac{\$344,445}{32,877,590} \times 1,000 = \$10.48$$

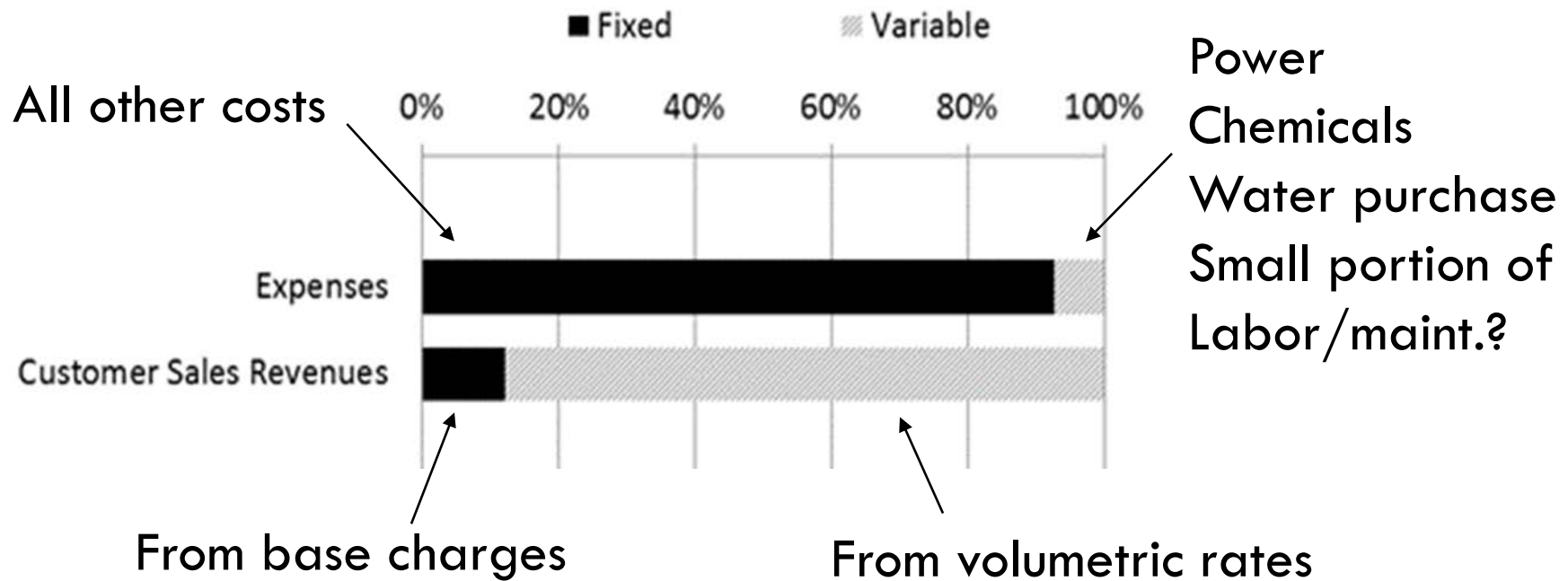
*Total Needed Revenue*

*Total Gallons Sold*

*Price per 1,000 Gallons*

Rate Structure: \$10.48/1,000 gallons

# Fixed vs. Variable (in the short term)



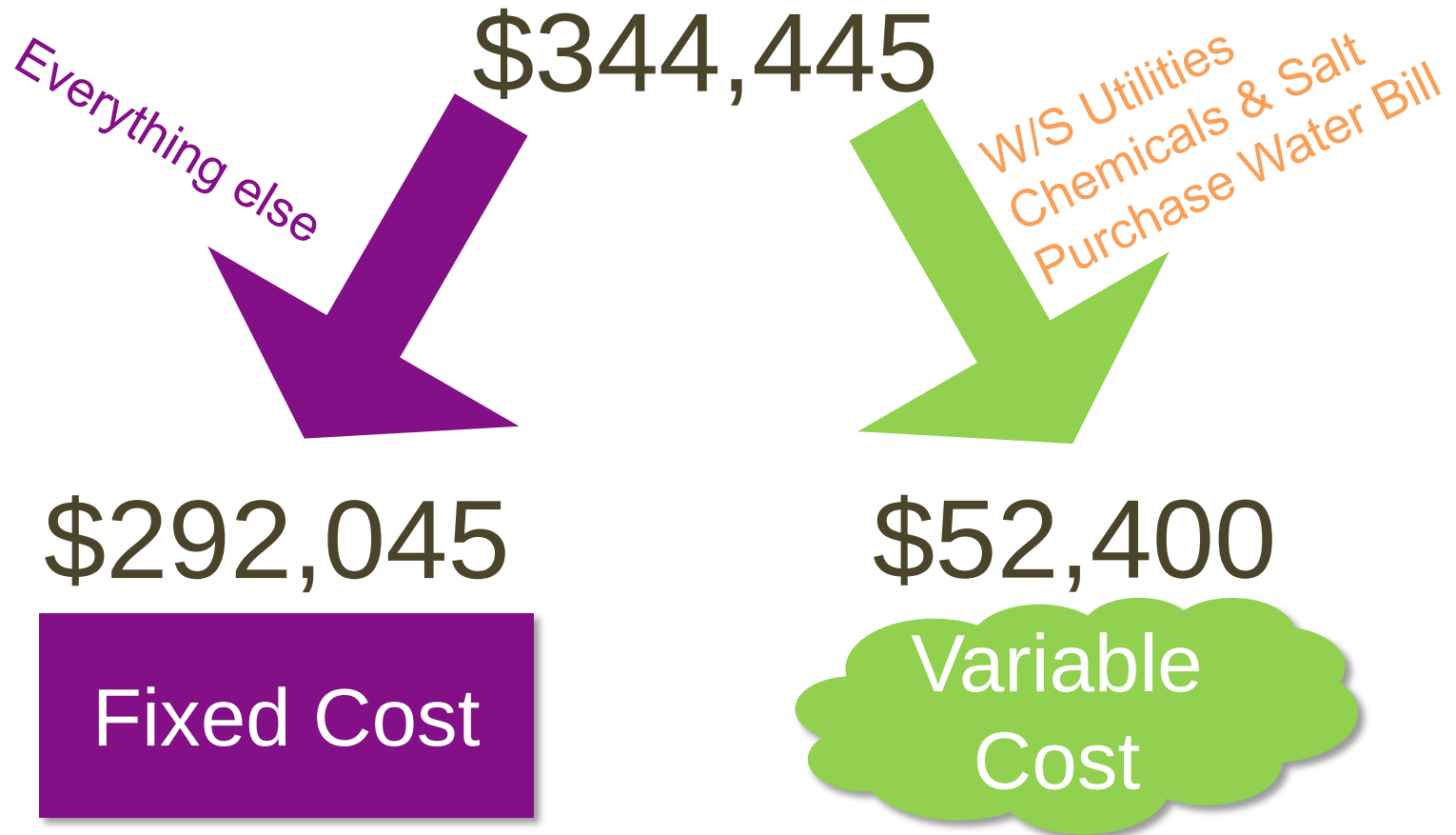
Source: One utility's expenses and revenues, shown in a Water Research Foundation report, 2014, *Defining a Resilient Business Model for Water Utilities*.

# Philosophy 3: Match Fixed vs. Variable Costs

“Fixed (base) charges should pay for all fixed costs. Volumetric charges should pay for variable costs.”

Extreme case: all short-term variable costs (power, chemicals, water purchase, etc.) paid for by volumetric charges. All other costs accounted for in the base charge because they do not vary by volume delivered in the short-term.

# From Irvindale's Budget



# Philosophy 3: Match Fixed vs. Variable Costs

\$292,045

*Fixed Annual Costs*

\$648.99

*Total Annual Bill*

\$54.08

*Monthly Base Bill*

450

*Total Accounts*

12

\$52,400

*Variable Annual Costs*

32,877,590

*Total Gallons Sold*

x 1,000 =

\$1.59

*Price per 1,000 Gallons*

Rate Structure:

\$54.08/month + \$1.59/1,000 gallons

# Philosophy 4: Balance Fixed vs. Variable Needs

“Balance revenue stability needs with other objectives.”

Determine what, at a minimum, should be paid for with fixed charges.

Some approaches:

- All “fixed” costs
- Customer service/billing costs
- Debt costs
- Capped at a high but “reasonable” amount
- Set at a low amount to maintain low-volume affordability

After the base charge is determined, calculate volumetric rate to generate the remainder of the revenue requirement.

# Philosophy 4: Balance Fixed vs. Variable Needs

$$\begin{array}{ccccccc} \boxed{12} & & \times & \boxed{\$25} & & \times & \boxed{450} = \boxed{\$135,000} \\ \text{Months} & & & \text{Monthly Base} & & & \text{Total Accounts} & & & \text{Total from Base Bill} \\ & & & \text{Bill} & & & & & & \end{array}$$

$$\begin{array}{r} \boxed{\$344,445} \\ \text{Total Revenue Needed} \\ - \boxed{\$135,000} \\ \text{Total from Base Bill} \\ \hline \boxed{\$209,445} \\ \text{Total Needed from Volumetric} \end{array}$$

$$\begin{array}{r} \boxed{\$209,445} \\ \text{Total Needed from Volumetric} \\ \hline \boxed{32,877,590} \\ \text{Total Gallons Sold} \end{array} \times 1,000 = \boxed{\$6.37} \text{ Price per 1,000 Gallons}$$

Rate Structure:

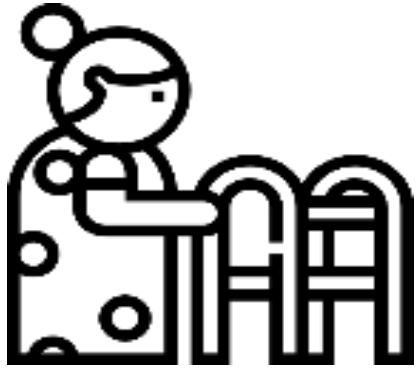
\$25.00/month  
+  
\$6.37/1,000  
gallons

# How Different Rate Structures Affect Customers

All four rate structures get us to the same total revenue.

But how does each approach impact different types of customers?

# Four Customers of Interest



1,000 gallons/month



4,000 gallons/month



12,000 gallons/month



34,000 gallons/month

How much will water service cost per month for different customers under each rate structure?

# Philosophy 1: Payment for Access

Rate Structure: \$63.79/month



\$63.79

\$63.79

\$63.79

\$63.79

# Calculate the Monthly Bill for Your Customer Under Rate Structures 2 - 4



1,000 gallons

Rate Structure 2:  
\$10.48/1,000 gallons



4,000 gallons

Rate Structure 3:  
\$54.08/month +  
\$1.59/1,000 gallons

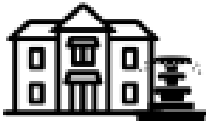


12,000 gallons

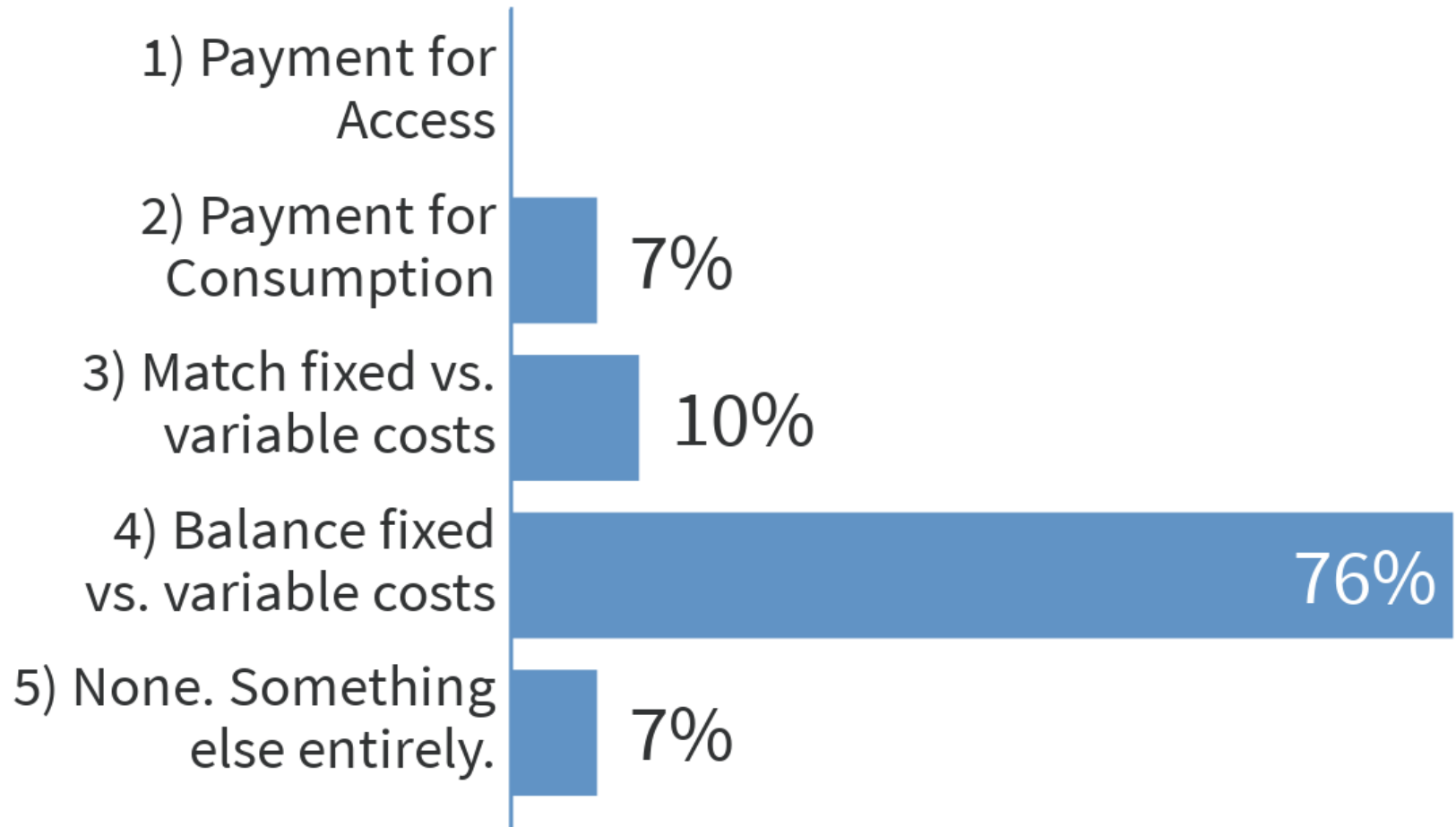
Rate Structure 4:  
\$25.00/month +  
\$6.37/1,000 gallons



34,000 gallons

|                                                          | <br>1,000<br>gallons/month | <br>4,000<br>gallons/month | <br>12,000<br>gallons/month | <br>34,000<br>gallons/month |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Rate Structure 1:<br>Payment for<br>Access               | \$63.79                                                                                                     | \$63.79                                                                                                      | \$63.79                                                                                                        | \$63.79                                                                                                        |
| Rate Structure 2:<br>Payment for<br>Consumption          | \$10.48                                                                                                     | \$41.92                                                                                                      | \$125.76                                                                                                       | \$356.32                                                                                                       |
| Rate Structure 3:<br>Match Fixed vs.<br>Variable Costs   | \$55.67                                                                                                     | \$60.44                                                                                                      | \$73.16                                                                                                        | \$108.14                                                                                                       |
| Rate Structure 4:<br>Balance Fixed vs.<br>Variable Needs | \$31.37                                                                                                     | \$50.48                                                                                                      | \$101.44                                                                                                       | \$241.58                                                                                                       |

# Which of these rate structures closest follows your rates philosophy?



In your group, discuss:

Pros and cons of each rate structure.

Which one would work best for *your* utility (not Irvindale)?

Or can you come up with a better (fifth) rate structure option?

Why did you make that choice?

# Balancing Objectives in Rate-Setting

- Revenue generation (cost recovery)
- Affordability
- Incentivizing conservation / preserve water supply
- Incentivizing business development
- Revenue stability
- Achieve financial performance targets
- Simplicity
- Fairness
- Equity
- Minimize cutoffs and delinquencies
- Other...

# Implement in Rate Setting Process

1. Start with the Mission of your utility / governing board's priorities / Master Plan
2. Understand your customer base and trends
3. Identify (and rank) specific objectives
4. Examine/adjust the rate structure design first
5. Determine all costs (incl. capital, reserves, source water protection) in revenue requirements
6. Calculate the rates for various scenarios
7. Determine the effects on key customer examples

# Small vs. Large Utilities

- Small:
  - Consider more fixed revenues (revenue stability)
  - Determine how much revenue comes from largest 5 customers
  - Go with a simple rate structure (unless you need to meet another objective)
- Large:
  - Include as many of your objectives and costs (incl. source water protection) in your rates and fees
  - Consider various customer types and classes
  - If water supply is a concern, use higher volumetric rates but do not bank on revenue generation from highest tiers
  - Consider alternative rate structures

# More Tips

- Analyze trends in your customer base and consumption
- Compute scenarios of rates instead of one projection
- If raising rates, lower your projected average demand
- Compute multi-year rates
- Include all costs, including source water protection, in rates

# Final Thoughts

No one rate structure perfectly fits two utilities' needs.

No one rate structure will remain perfect for a utility over the years.

**Define** your utility's rate setting philosophy and objectives, **design** your rate structure accordingly, and **adjust** both as needed over time.

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