



Smart Management for  
Small Water Systems

## Rates and Finance Workshop for Small Water Systems

09/21/17| St. George, UT

*[www.efcnetwork.org](http://www.efcnetwork.org)*



UNC  
ENVIRONMENTAL  
FINANCE CENTER



American Water Works  
Association

This program is made possible under a cooperative agreement with the U.S. EPA.



# **Generating Needed Revenue – Rates**



© 2004 Ted Goff



**“This part of the plan will be funded with all the unused money we must have laying around someplace.”**



# Session Objectives

- Understand how to pay for the costs of running your water system
- Look more closely at your rates



# COMMON FUNDING METHODS



# Who Really Pays

- Current customers (you)
- New customers
- Future customers (the next generation)
- The people that own and buy products from industries (including you)
- US tax payer (including you and some lady who lives in Vermont!)



# How the Payments are Made

- Save in advance and pay
- Pay as you go (current receipts)
- Pay afterwards (someone loans you money)
- Grants



# Where Does the Money Come From?

- Loans
- Grants
- Bonds
- User fees
- Assessments
- Impact fees
- Taxes



## **Grants Aren't Completely Free Money**

- Application for the grant can be expensive – staff time and money
- Applications can take months to process
- Often lots of strings attached
- Often require a percentage match
- Lots of competition
- Difficult to sustain



# Bonds

- A written promise to repay borrowed money (on a definite schedule and usually at a fixed rate of interest for the life of the bond)
- Different types exist:
  - General Obligation (GO)
  - Revenue



# User Fees

- Charged regularly to all customers: industrial, commercial and residential
- Customers' bills relate to their consumption (usually)
- Utilities can develop rates based on their expected costs
- Example – water/sewer/stormwater utility fees



# Assessments

- A recurrent charge to a sub-group of the population
- The sub-group receives benefits from an environmental service or improvement not enjoyed by others in the area
- Close cost/benefit relationship → equity



# Impact Fees

- One-time charges to new users
- Typically assessed when building permits are issued
- Close cost/benefit relationship → equity



# Taxes

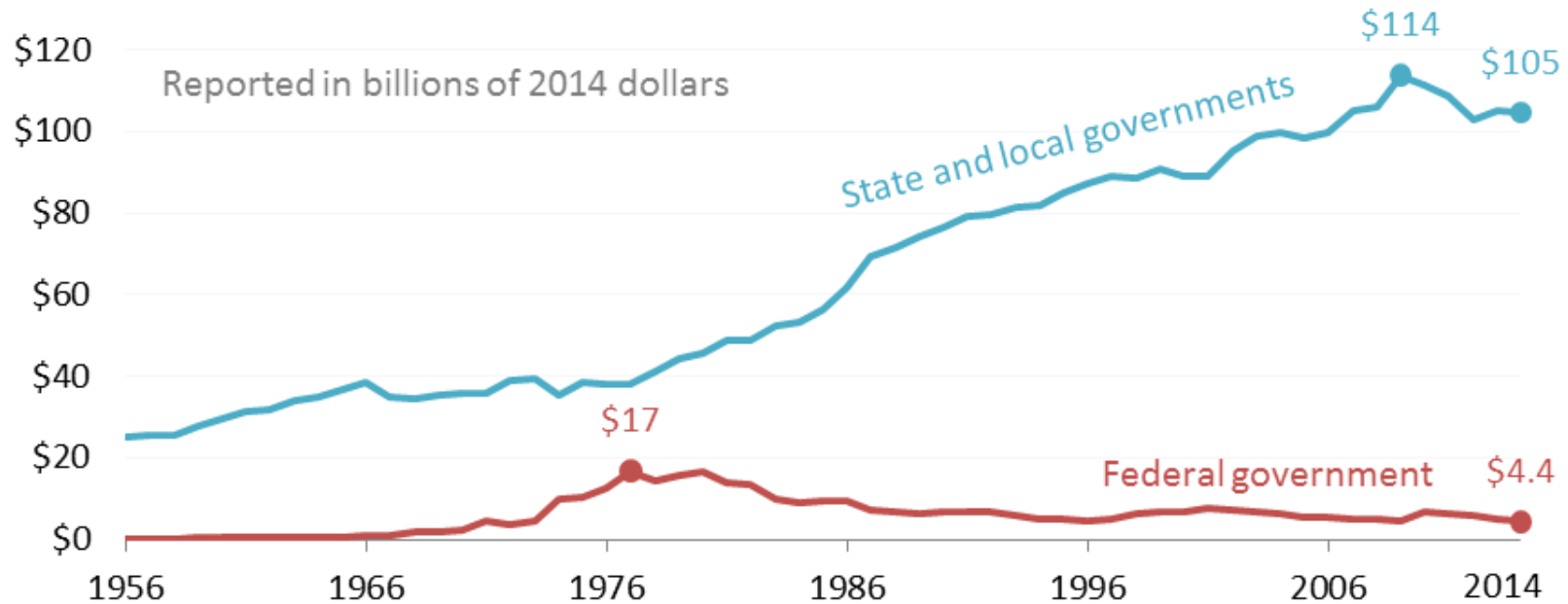
- Charged against:
  - Income (federal/state level)
  - Property (local level)
  - Sales (state level, with surcharges at the local level)
- Local Sales Tax
  - Example: SPLOST



## Money is not likely coming from the federal government

**State and local government spending** on water and wastewater utilities continued to grow while **federal spending** declined since the 1980s

State and local governments spent 24 times as much as the federal government in 2014



Graphed by the Environmental Finance Center at the University of North Carolina, Chapel Hill.

Source: Congressional Budget Office supplemental data for the *Public Spending on Transportation and Water Infrastructure, 1956 to 2014* report (March 2015). Displays public spending on supply systems for distributing potable water as well as wastewater and sewage treatment systems and plants. Real spending is shown after adjusting nominal spending to their 2014 dollar equivalent using infrastructure-specific price indexes.



# Rates & Monthly Charges

- What type of rates and monthly charges do you levy?
  - Charges based on metered usage?
  - Flat monthly charges?
  - Something else?
  - Nothing?



**How much money  
do you need?**



Will it provide sufficient cost recovery?

Are we following the applicable laws?

Are we allocating the costs to the right customers?

Will our customers understand these rates?



What exactly does this include?

Will revenues be resilient to changing water demands?

Do these rates send the right signals to our customers, based on our objectives?

Will our customers be able to pay these rates?



Learn essential background information about rates

Determine critical characteristics of your utility and community

Design the most appropriate rate structure

*Cost-of-Service Study*

Compute the rates using projected costs and revenues

Re-evaluate/adjust rate structure to fit primary objectives

## The Process of Setting Rates



# Basic Principles

- Aim at full cost pricing
- Set equitable rates
- Share rate structure with customers
- Rate should be easy to understand
- Rates should be examined annually
- Consider fixed costs vs. variable costs
- Allow for reserve account(s)
- *Promote water conservation?*
- *Promote economic development?*



# **“Full Cost Pricing”**

- Operations & maintenance expenditures
- Taxes and accounting costs
- Contingencies for emergencies
- Principal and interest on long-term debt
- Reserves for capital improvement
- Source water protection

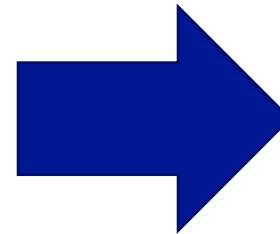
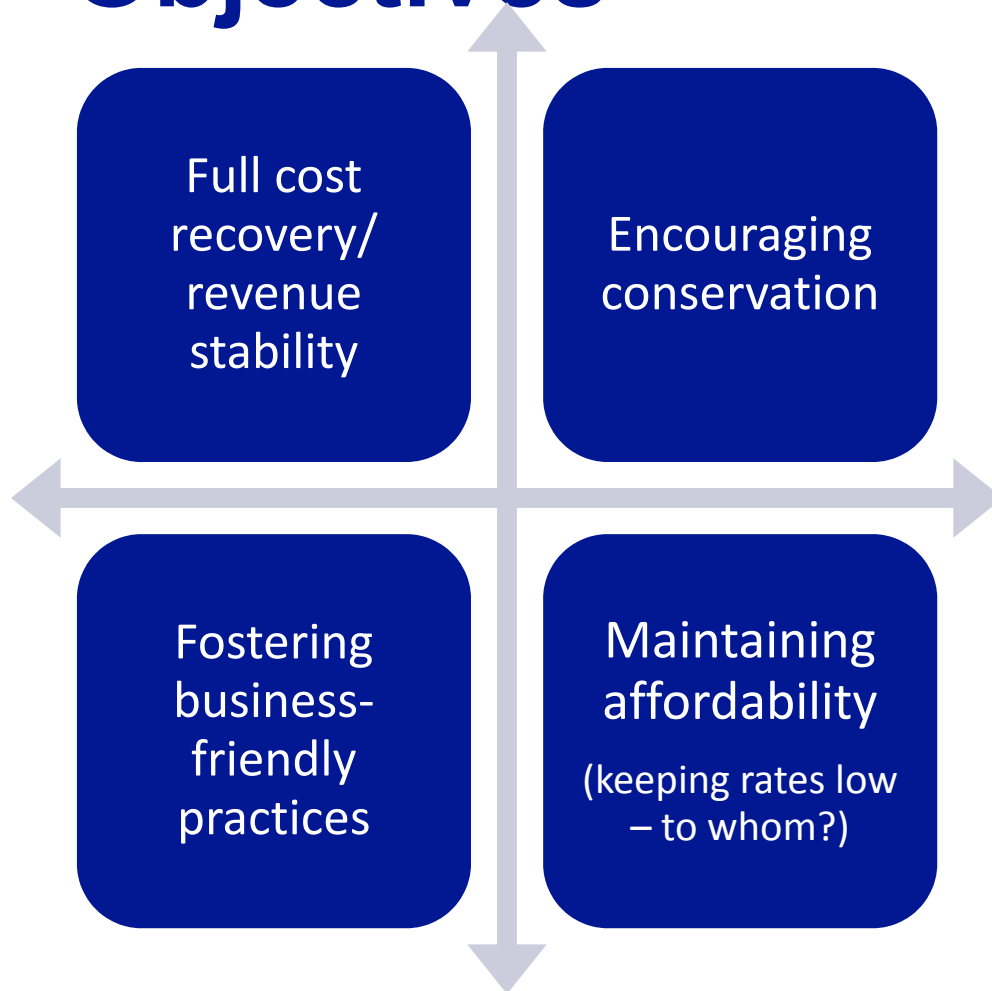


# Understanding Your Utility and Served Community

- What is the make up of your served community?  
Have a lot of large families? What is the community's ability to pay? Is it a seasonal community? Does demand vary greatly in the summer? Does a large fraction of your revenues come from a small number of customers?
- Do you anticipate any large capital expenses in the next few years? Check/create your C.I.P. and asset management plan.
- Do you have any debt service payment requirements?
- Do you expect to meet demands comfortably (in case there is a drought)?
- Rank your utility's rate setting objectives



# Rank Your Rate Setting Objectives



1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

Refer to this list and focus on the highest ranked objectives when following the guidelines for selecting the appropriate rate structure design.



**What are your rate setting objectives?**



# Elements of Rate Structure Designs

1. Customer classes/distinction
2. Billing period
3. Base charge
4. Consumption allowance included with base charge
5. Volumetric rate structure
6. (If applicable) Number of blocks, block sizes and rate differentials
7. (Optional) Drought Rates
8. Frequency of rate changes



# Customer Classes/Distinctions

- One rate structure for all
- Target: All are equal



# Customer Classes/Distinctions

- Separate rate structure for residential, irrigation, commercial, industrial, governmental, or wholesale customers
- Target: Specific type of customer



# Customer Classes/Distinctions

- One rate structure, but with different base charges based on meter size
- Target: Non-residential or multi-family housing



# Customer Classes/Distinctions

- One rate structure for all, but with blocks that implicitly only target non-residential use
- Target: Non-residential



# Customer Classes/Distinctions

- Different rates for customers outside municipal limits/service area boundaries
- Target: “Outside” customers

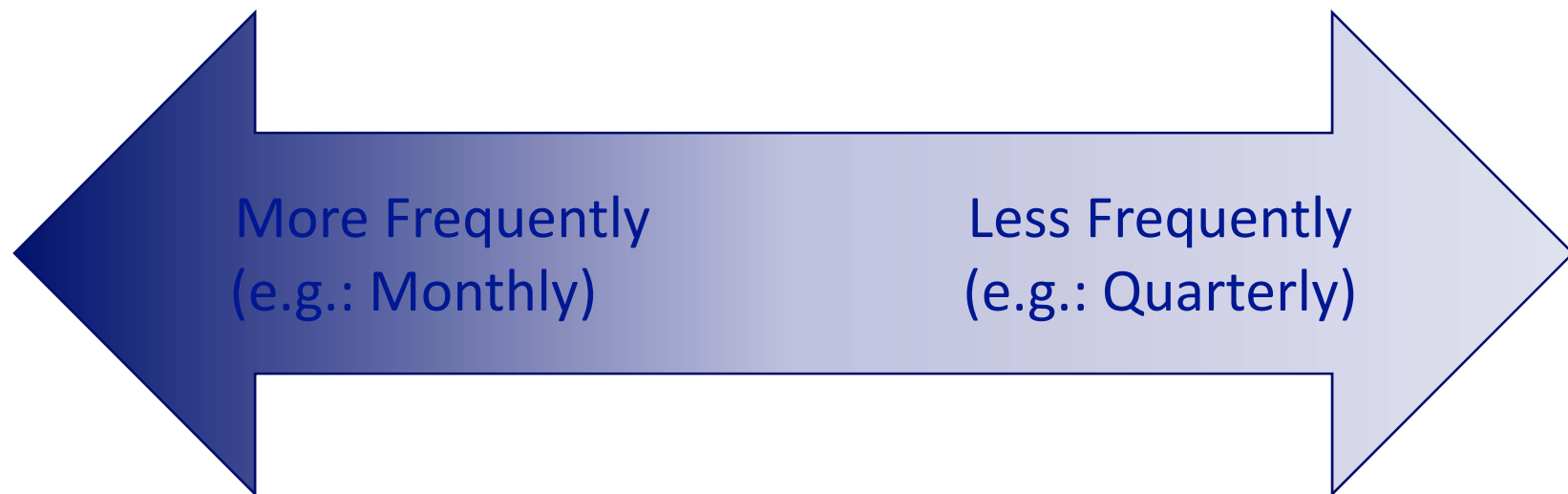


# Customer Classes/Distinctions

- Negotiated rate structure with individual high-use customers (typically an industrial customer)
- Target: Only one customer



# Billing Period

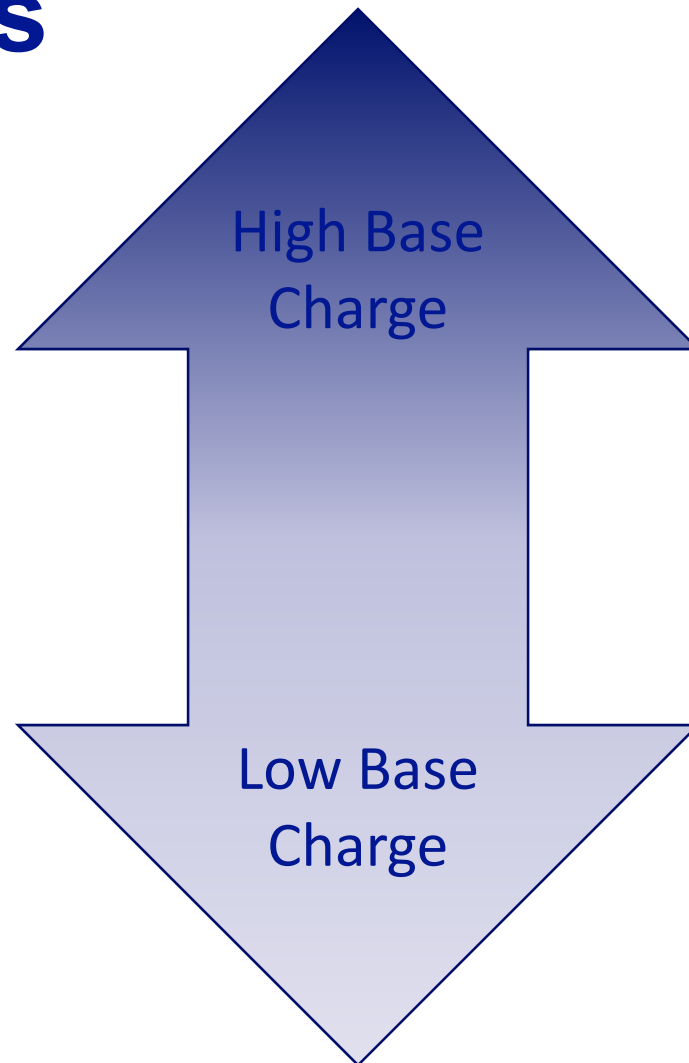


*Suggestion: Use a monthly billing period if you can afford it*



# Base Charges

*Suggestion:  
Smaller utilities  
should lean  
towards higher  
base charges*





# Consumption Allowance with Base Charge

Do not  
include any  
(0 gallons)

Include some  
amount  
(e.g. 1,000 gal/mo)

Include high  
amount  
(e.g. 3,000 gal/mo)

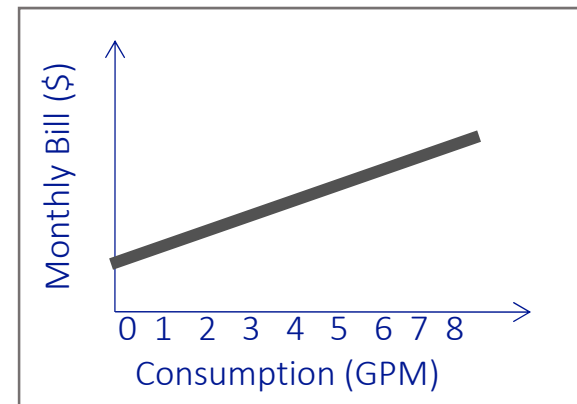
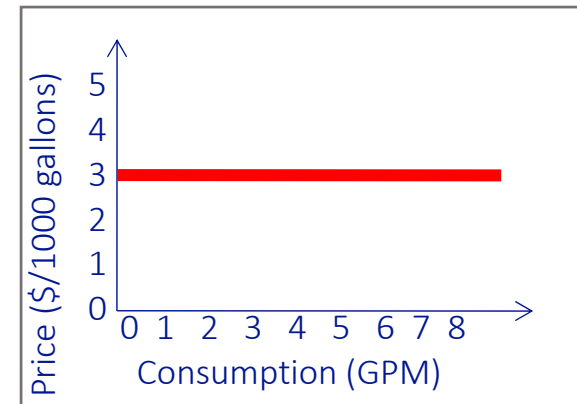
*Suggestion: For systems with low base charges, do not include any consumption allowance. For systems with high base charges but wish to encourage conservation, keep consumption allowance low, if any.*



# Volumetric Rate Structure

## Uniform (“Flat”) Rates

- Fair and simple

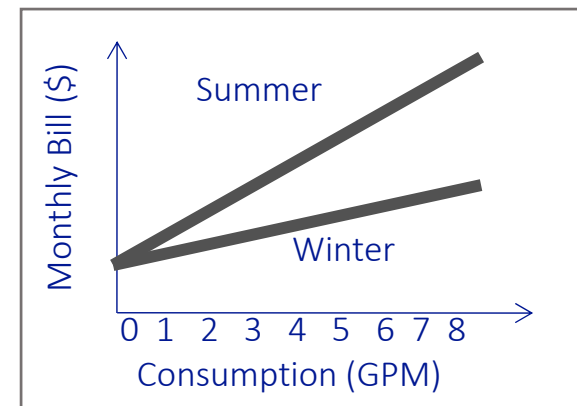
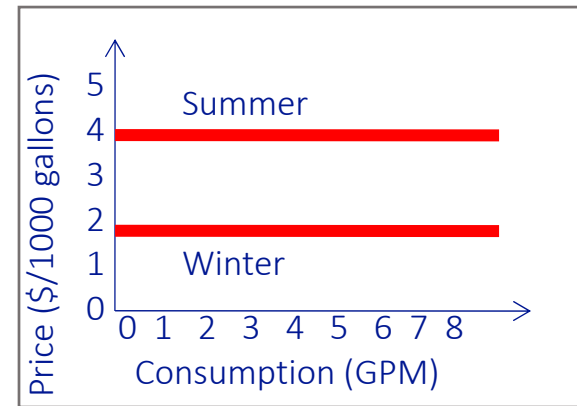




# Volumetric Rate Structure

## Seasonal (Uniform) Rates

- Conservation-oriented, good for seasonal communities

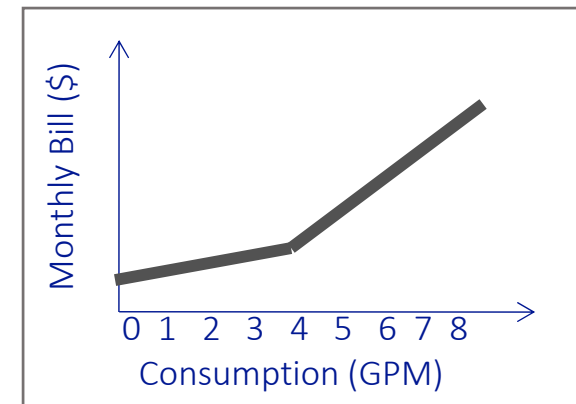
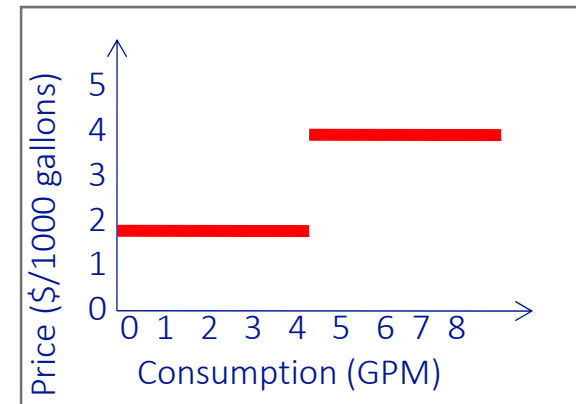




# Volumetric Rate Structure

## Increasing Block Rates

- Conservation-oriented
- Consider large families

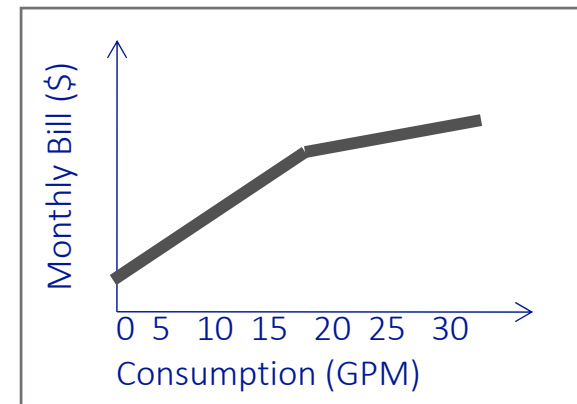
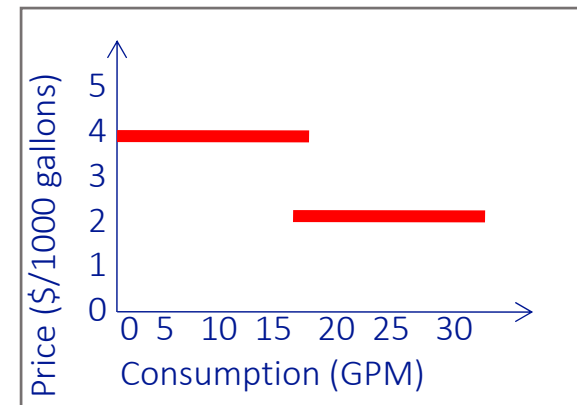




# Volumetric Rate Structure

## Decreasing Block Rates

- Provide price break for large users (e.g.: commercial)
- Do not use for residential





# **(If Applicable) Block Designs**

For block rate structures to be effective:

- Decide on the correct number of blocks
- Decide on where the blocks should end/start
- Set significant rate differentials between blocks



# **(If Applicable) Block Designs**

For block rate structures to be effective:

- Keep in mind your base charge and consumption allowance
- Meter reading must be punctual, and meters must be replaced frequently
- Think about large families



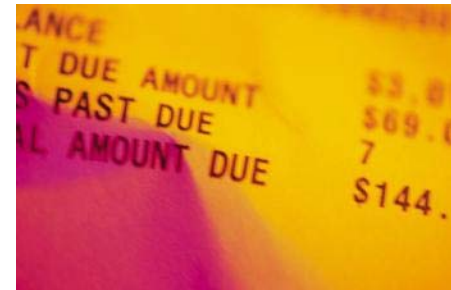
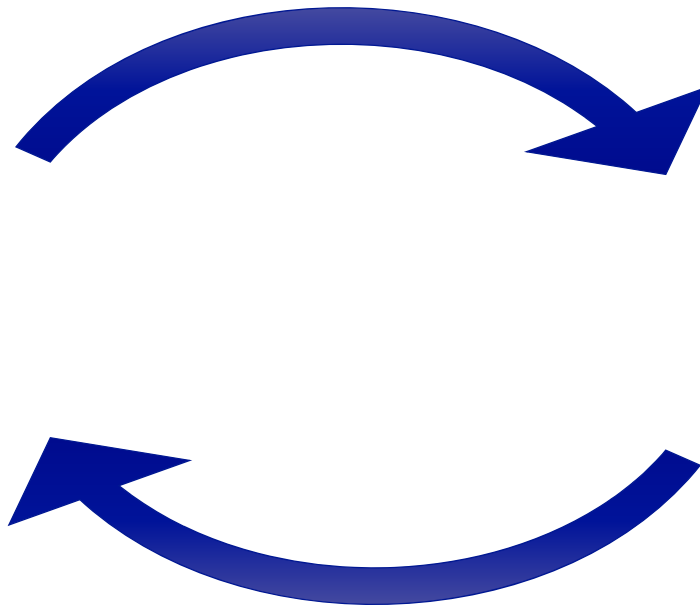
# (Optional) Drought Rates

- Prepare for drought in advance: create an ordinance *in advance* to give the utility the ability to raise rates temporarily during a water shortage scenario (sometimes called “drought surcharges”).



# How Rates and Usage Interact

Set rates based on projected water use



Raising rates lowers water use

Rule of thumb: water use declines ~2-6% as rates increase 10%



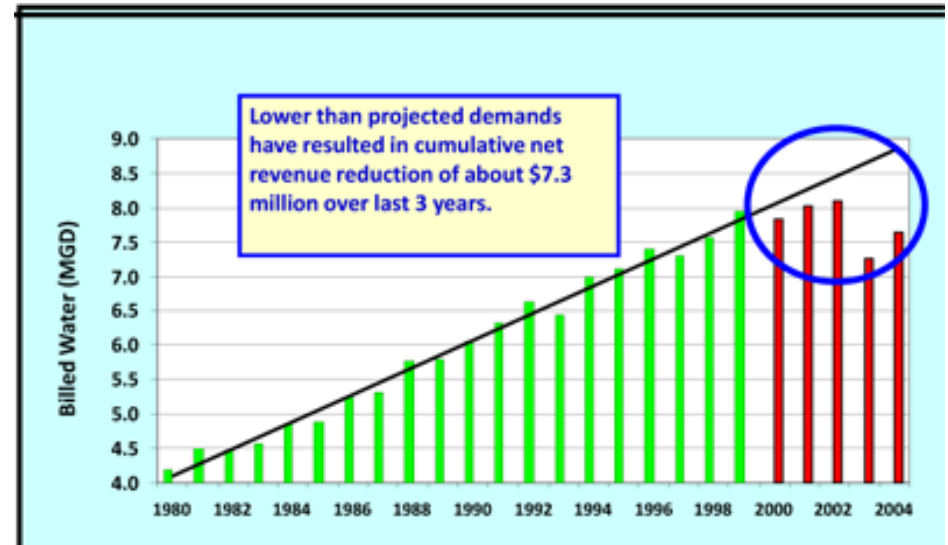
# Background Information: How Rates and Usage Interact

Public Perception:



Source: Fayetteville Observer 2/6/2004

Utility Reality:

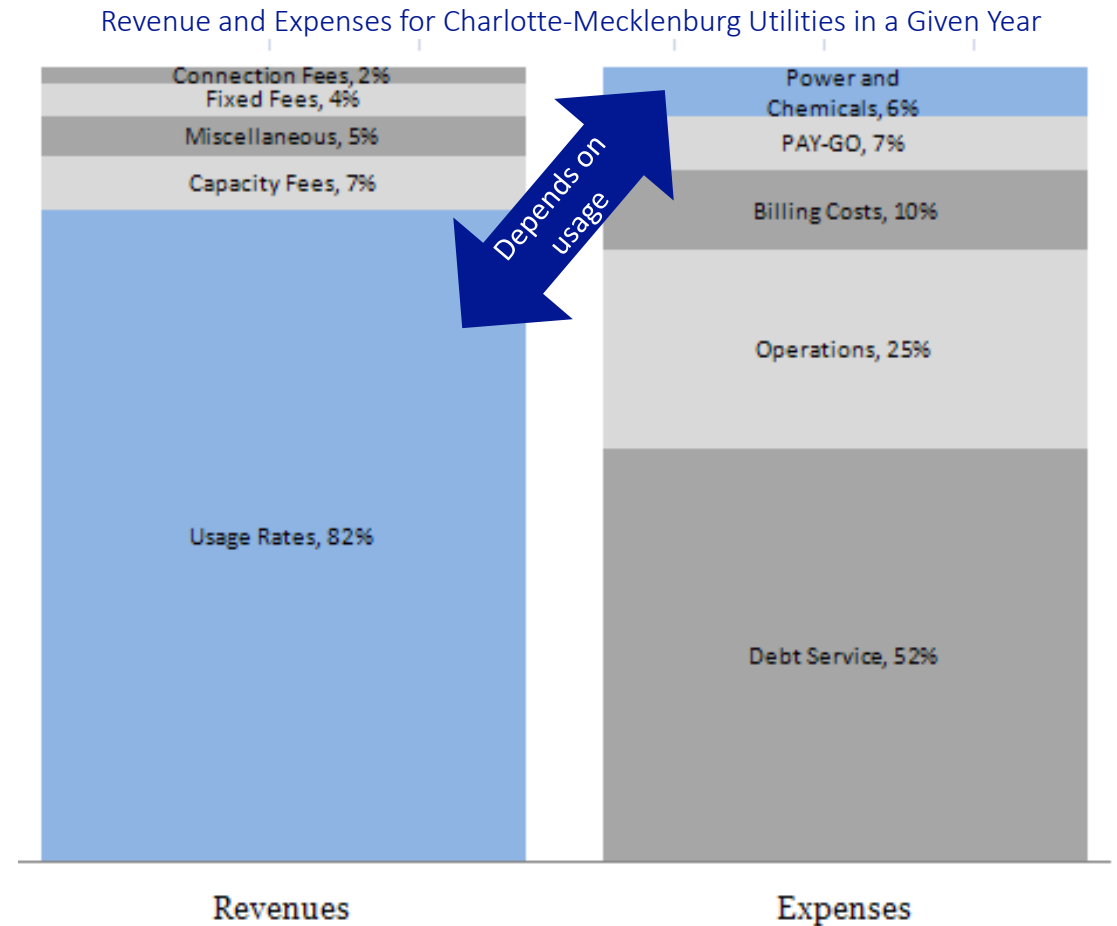


Source: Orange Water & Sewer Authority



## Why Does this Happen?

Utilities' costs are mostly *fixed*, not dependent on the amount of water sold/used by the customers. But the majority of revenues come from the amount of water sold. If customers conserve, revenues drop significantly but not costs.



Source: CMU Director Doug Bean's presentation to the Charlotte City Council on December 1, 2008.



# Frequency of Rate Changes

- Always review your rates annually (recommended)
- Review your financial health indicators annually, and then review your rates if any of the indicators reflect poor financing
- Perhaps less politically charged option: Raise rates each year automatically based on inflation



# Frequency of Rate Changes

- *Important: Avoid maintaining low rates at the expense of your utility's financial health. It will either lead to a sudden, massive rate increase in the future or to failing systems and endangering public health.*



**Look at your rate setting objectives. Look at your rate structure. Do they line up? What changes do you want to consider?**



# **Water and Sewer Rates Analysis Model**



<http://efc.sog.unc.edu/reslib/item/water-sewer-rates-analysis-model>

## Data Input 1

Rate\_Analysis-version2 - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

Q3 100

**Water and Sewer Rates Analysis Model. Version 2.0**

**Inputs: Rates and Rate Structures**

Input current rate and account information in the dark green cells to analyze projected cashflows from rate changes.

**Rate Structure** FY: 2012 2013

**Residential Rates** Existing New

Water Base Rate \$10.00 \$12.00

Water:

Block Rate 1 (\$/1,000 gal) \$1.00 \$1.25

Block Rate 2 (\$/1,000 gal) \$2.00 \$2.25

Block Rate 3 (\$/1,000 gal) \$3.00 \$3.25

Block Rate 4 (\$/1,000 gal) \$4.00 \$4.25

Final Block Rate (\$/1,000 gal) \$5.00 \$5.25

Sewer Base Rate \$10.00 \$12.00

Sewer:

Block Rate 1 (\$/1,000 gal) \$1.00 \$1.25

Block Rate 2 (\$/1,000 gal) \$2.00 \$2.25

Block Rate 3 (\$/1,000 gal) \$3.00 \$3.25

Block Rate 4 (\$/1,000 gal) \$4.00 \$4.25

Final Block Rate (\$/1,000 gal) \$5.00 \$5.25

**Rate Structure** 2012 2013

**Commercial Rates** Existing New

Water Base Rate \$10.00 \$12.00

Water:

Block Rate 1 (\$/1,000 gal) \$1.00 \$1.25

Block Rate 2 (\$/1,000 gal) \$2.00 \$2.25

Block Rate 3 (\$/1,000 gal) \$3.00 \$3.25

Block Rate 4 (\$/1,000 gal) \$4.00 \$4.25

Final Block Rate (\$/1,000 gal) \$5.00 \$5.25

Sewer Base Rate \$10.00 \$12.00

Sewer:

Block Rate 1 (\$/1,000 gal) \$1.00 \$1.25

Block Rate 2 (\$/1,000 gal) \$2.00 \$2.25

Block Rate 3 (\$/1,000 gal) \$3.00 \$3.25

Block Rate 4 (\$/1,000 gal) \$4.00 \$4.25

Final Block Rate (\$/1,000 gal) \$5.00 \$5.25

**Rate Structure** 2012 2013

**Irrigation Rates** Existing New

Irrigation Base Rate \$0.00 \$0.00

Irrigation:

Block Rate 1 (\$/1,000 gal) \$3.50 \$3.50

Block Rate 2 (\$/1,000 gal) \$3.50 \$3.50

Block Rate 3 (\$/1,000 gal) \$3.50 \$3.50

Block Rate 4 (\$/1,000 gal) \$3.50 \$3.50

Final Block Rate (\$/1,000 gal) \$3.50 \$3.50

**Tap Fees** 2012 2013

Existing New

Average Sewer Tap Fee \$2,000.00 \$2,400.00

Average Water Tap Fee \$500.00 \$600.00

Average Irrigation Tap Fee \$2,200.00 \$2,500.00

**Data Input Color Explanation:**

White: Data to be entered, can be changed

Black: Automatically calculated data; do not change!

Red: Important Results

**cubic feet to gallons converter**

100 cubic feet = 748 gallons

**\$/ccf to \$/1000 gallons converter**

\$ 1.00 /hundred cubic feet = \$1.34 /1,000 gallons

Input block sizes (state and end) in gallons/month

Input rates in \$/1000 gallons

Use the converters above for converting from cubic feet units

**Number of Accounts** 2012 Existing Growth Rate:

Residential Water 3000 0.50%

Residential Sewer 2500 0.50%

Commercial Water 200 0.50%

Commercial Sewer 80 0.50%

Irrigation Water 3000 0.50%

**Miscellaneous** 2012 Existing

Uncollected Bills 8.0%

Non-revenue Water 15.0%

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Funded by the NC Department of Environment and Natural Resources and the U.S. Environmental Protection Agency

Instructions Data Input 1 Data Input 2 Charts Fund Balance - Existing Rates Fund Balance - New Rates

Ready Calculate Scroll Lock



# Water and Sewer Rates Analysis Model - Results

- Results are Excel Spreadsheet with:
    - The Fund Balance Under **Existing** Rates
    - The Fund Balance Under **Proposed** Rates
- ...Projected for the next 20 years



## **Scenario: Rural Water Utility With Naturally High Costs and Excess Capacity, Wants to Maintain Affordability**

1. Customer class: possibly create separate residential class.
2. Billing period: use monthly.
3. Base charge: if majority of customers use little water, charge fair base charge and include allowance. Otherwise, low base charge, and shift high rates to high volume users.
4. Consumption allowance: if including, set at a lifeline amount (~2,000 gallons/month).
5. Volumetric rate structure: probably use uniform
6. (If applicable) Block design: if using, first block at least 4,000 GPM, depending on your customers' consumption.
7. (Optional) Temporal adjustments: none.
8. Frequency of rate changes: annual.



# Pricing Out Your Rate Structure (References)

Use any of several reference documents with step by step instructions on calculating projected costs, revenues and rates:

- AWWA (2000). *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices, M1.*
- U.S. Environmental Protection Agency (2006). *Setting Small Drinking Water System Rates for a Sustainable Future: One of the Simple Tools for Effective Performance (STEP) Guide Series.* EPA 816-R-05-006. Office of Water, Washington DC. 62 pages.  
[http://www.epa.gov/waterinfrastructure/pdfs/final\\_ratesetting\\_guide.pdf](http://www.epa.gov/waterinfrastructure/pdfs/final_ratesetting_guide.pdf)
- Georgia Environmental Protection Division (2007). *Conservation-Oriented Rate Structures.*  
[http://www1.gadnr.org/cws/Documents/Conservation\\_Rate\\_Structures.pdf](http://www1.gadnr.org/cws/Documents/Conservation_Rate_Structures.pdf)