



Smart Management for
Small Water Systems

Rates and Finance Workshop for Small Water Systems

09/21/17| St. George, UT

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

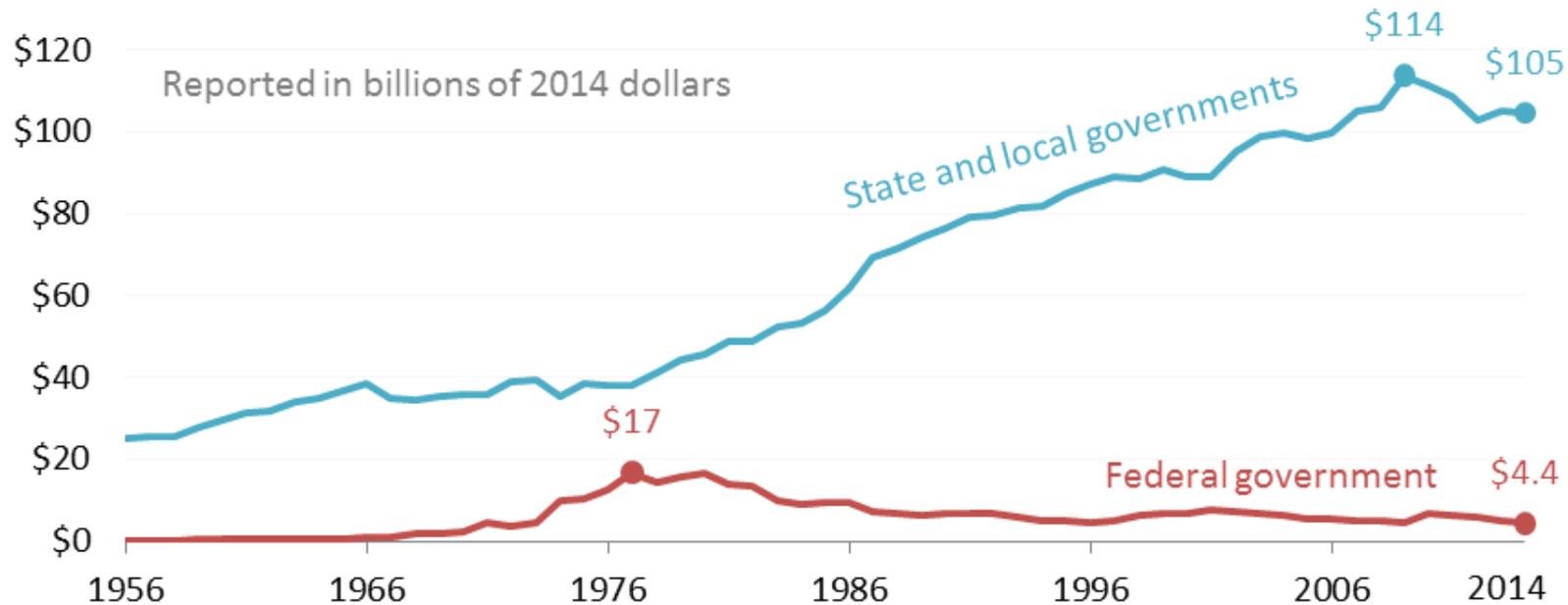
- Charged against:
 - Income (federal/state level)
 - Property (local level)
 - Sales (state level, with surcharges at the local level)
- Local Sales Tax
 - Example: SPLOST



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?



Will our customers be able to pay these rates?

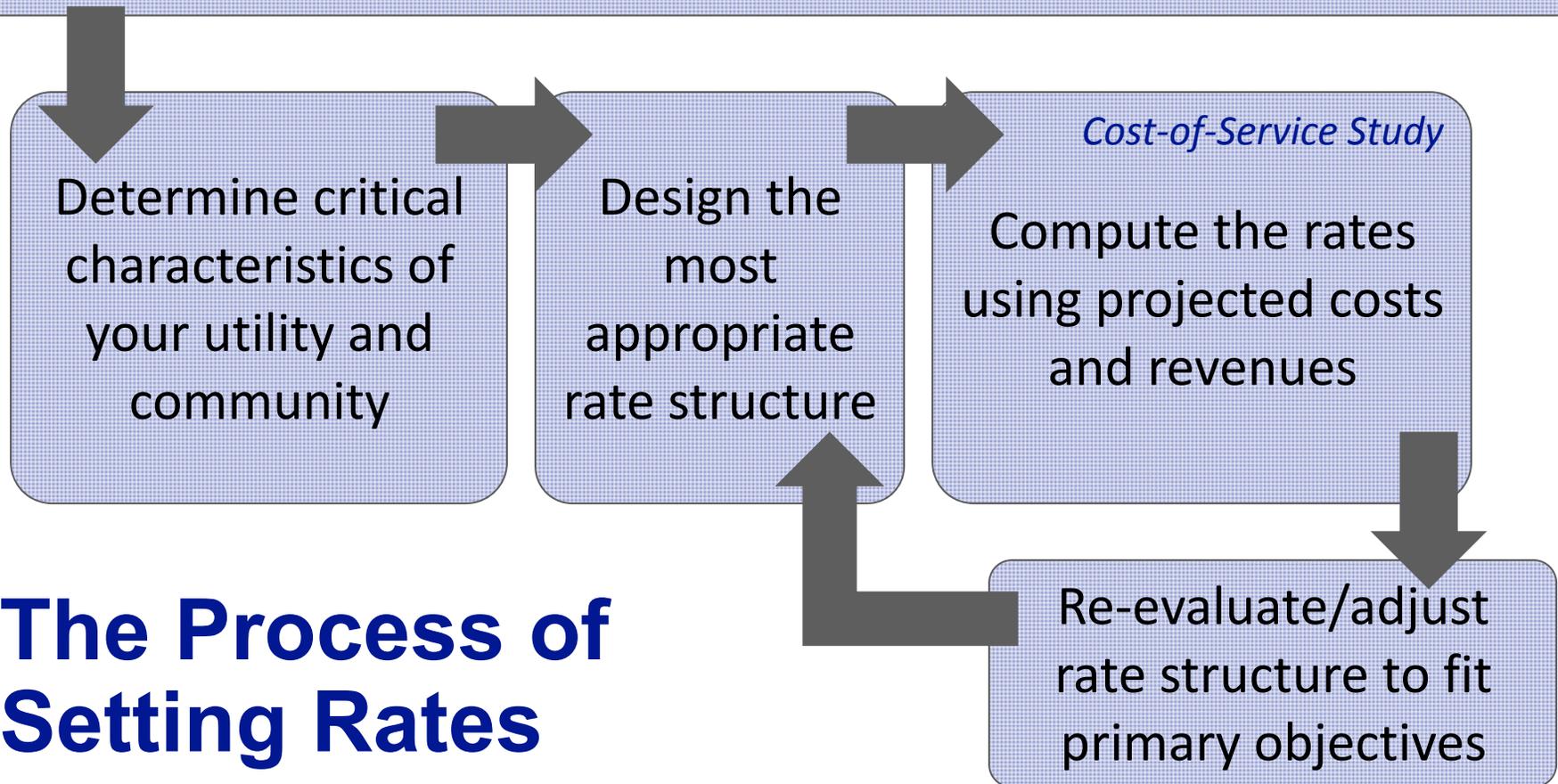
What exactly does this include?

Will revenues be resilient to changing water demands?

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



Learn essential background information about rates



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

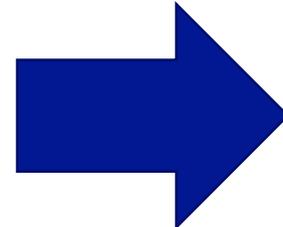
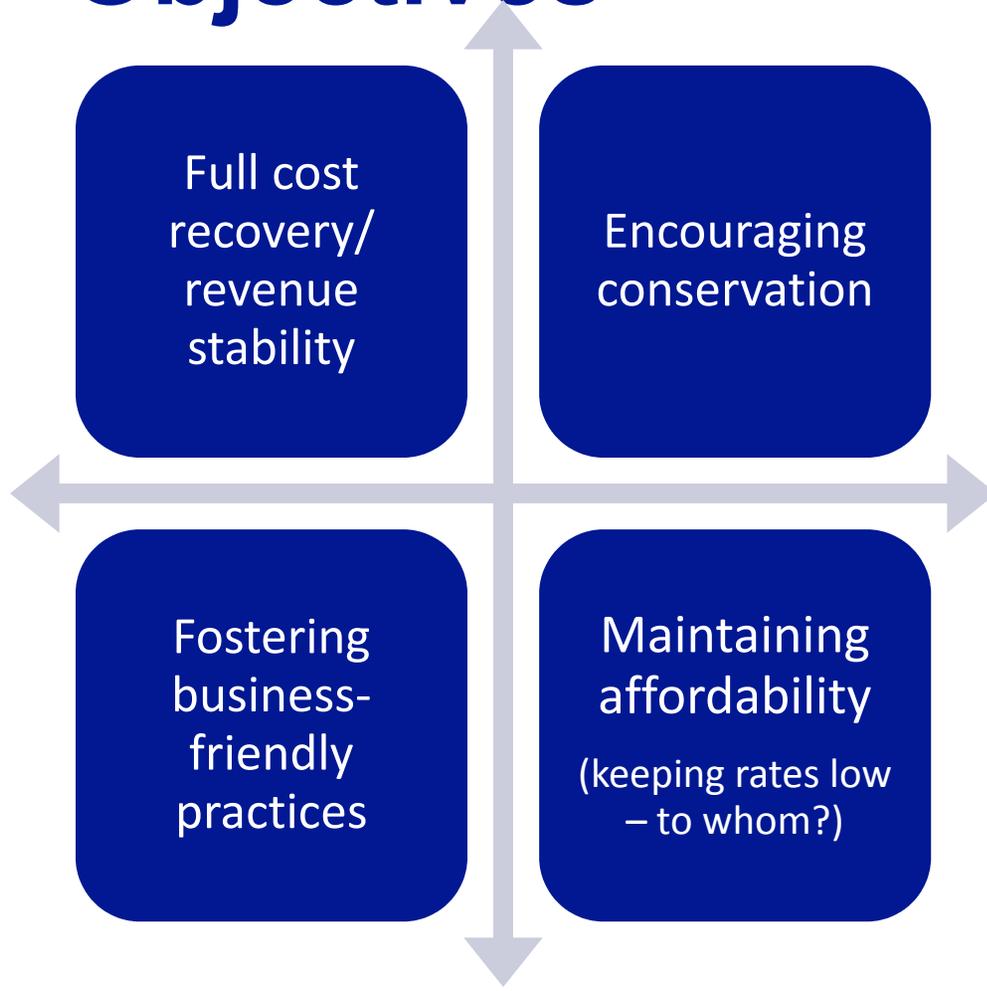


Understanding Your Utility and Served Community

- 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

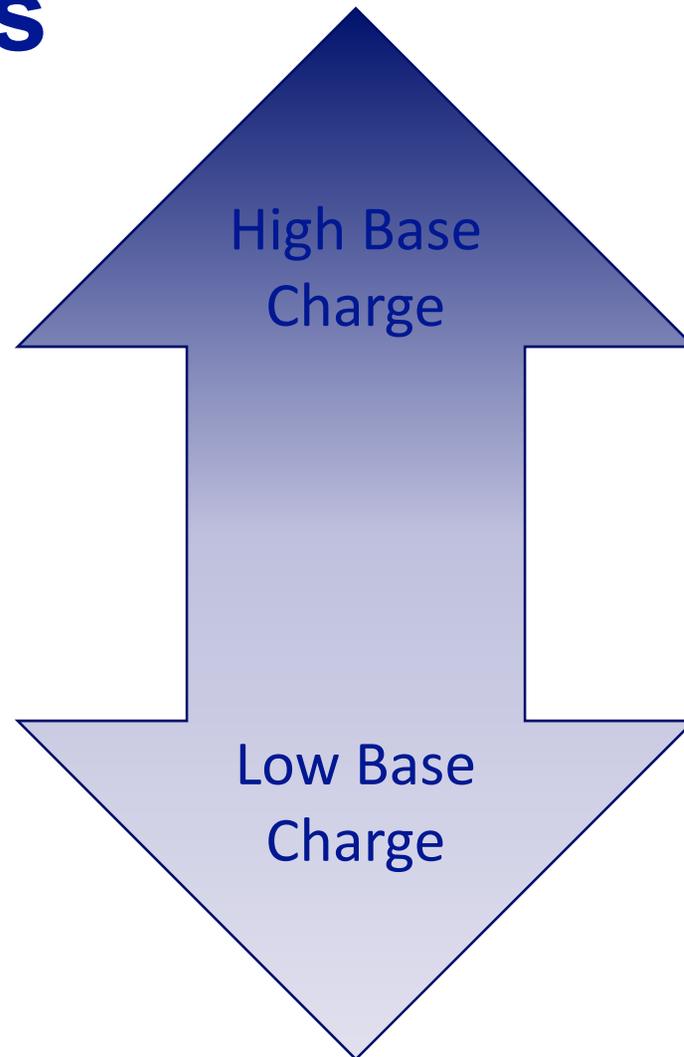


Suggestion: Use a monthly billing period if you can afford it



Base Charges

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





Consumption Allowance with Base Charge



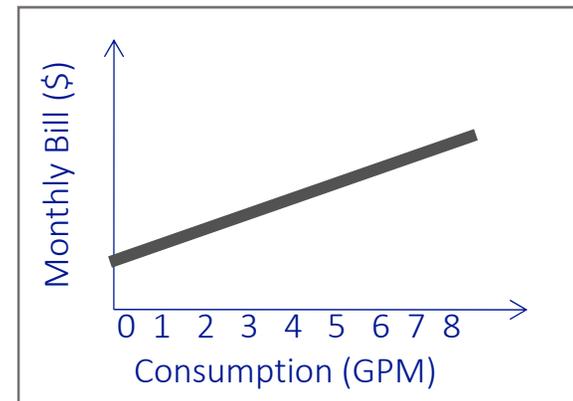
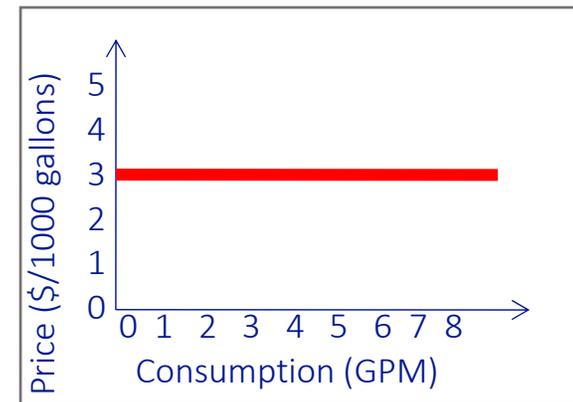
Suggestion: For systems with low base charges, do not include any consumption allowance. For systems with high base charges but wish to encourage conservation, keep consumption allowance low, if any.



Volumetric Rate Structure

Uniform (“Flat”) Rates

- Fair and simple

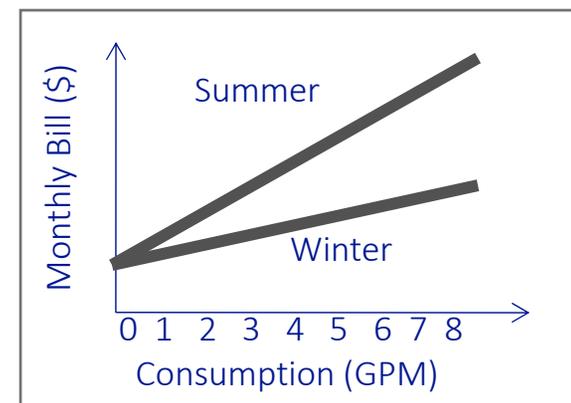
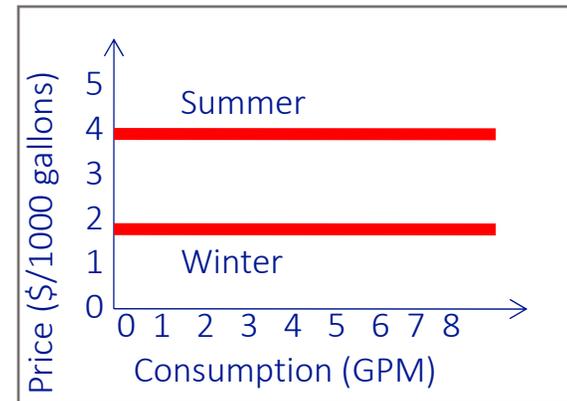




Volumetric Rate Structure

Seasonal (Uniform) Rates

- Conservation-oriented, good for seasonal communities

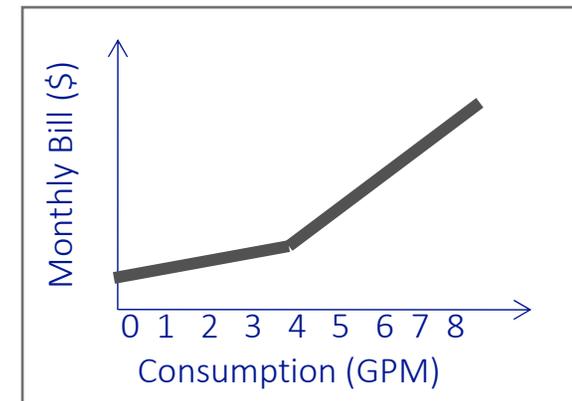
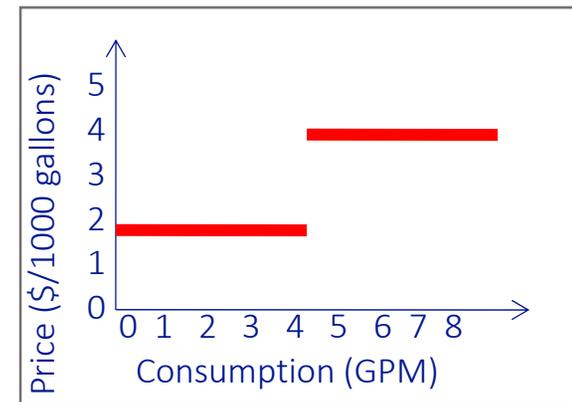




Volumetric Rate Structure

Increasing Block Rates

- Conservation-oriented
- Consider large families

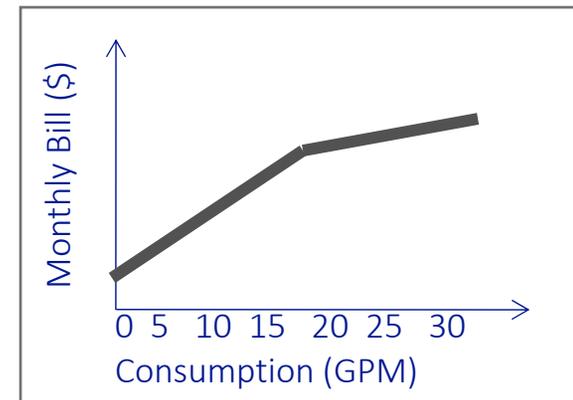
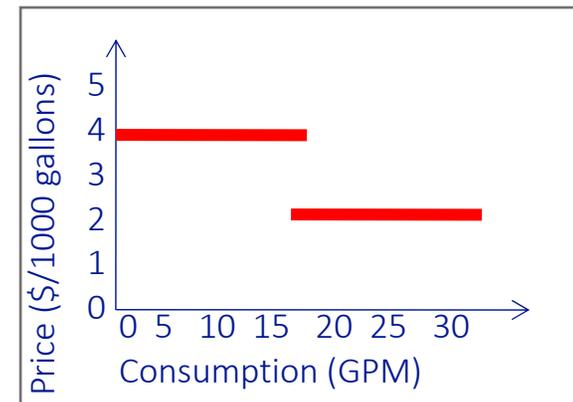




Volumetric Rate Structure

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



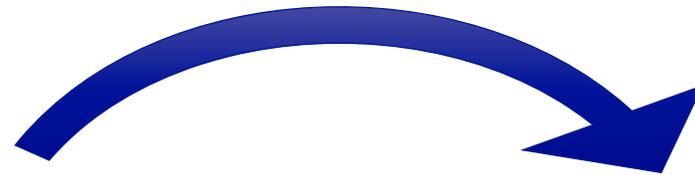
(Optional) Drought Rates

- 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%



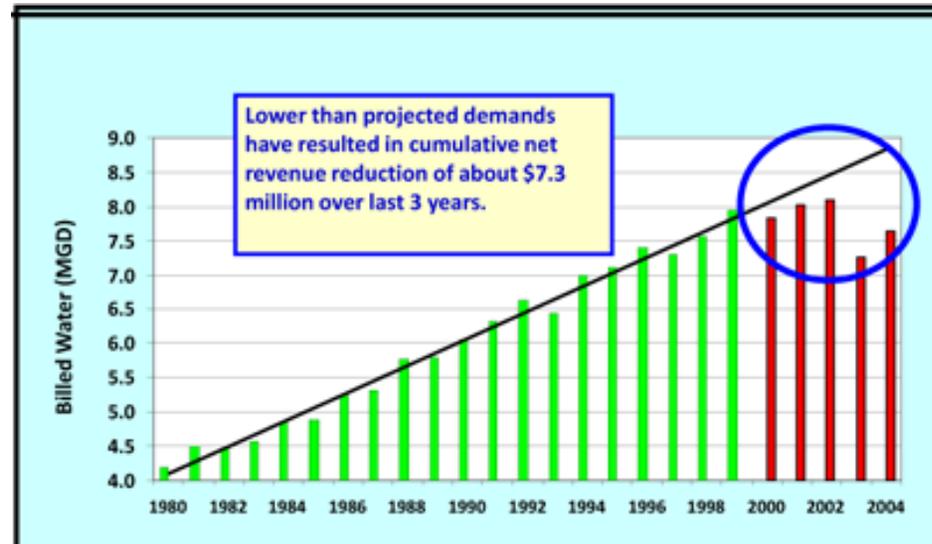
Background Information: How Rates and Usage Interact

Public Perception:



Source: Fayetteville Observer 2/6/2004

Utility Reality:

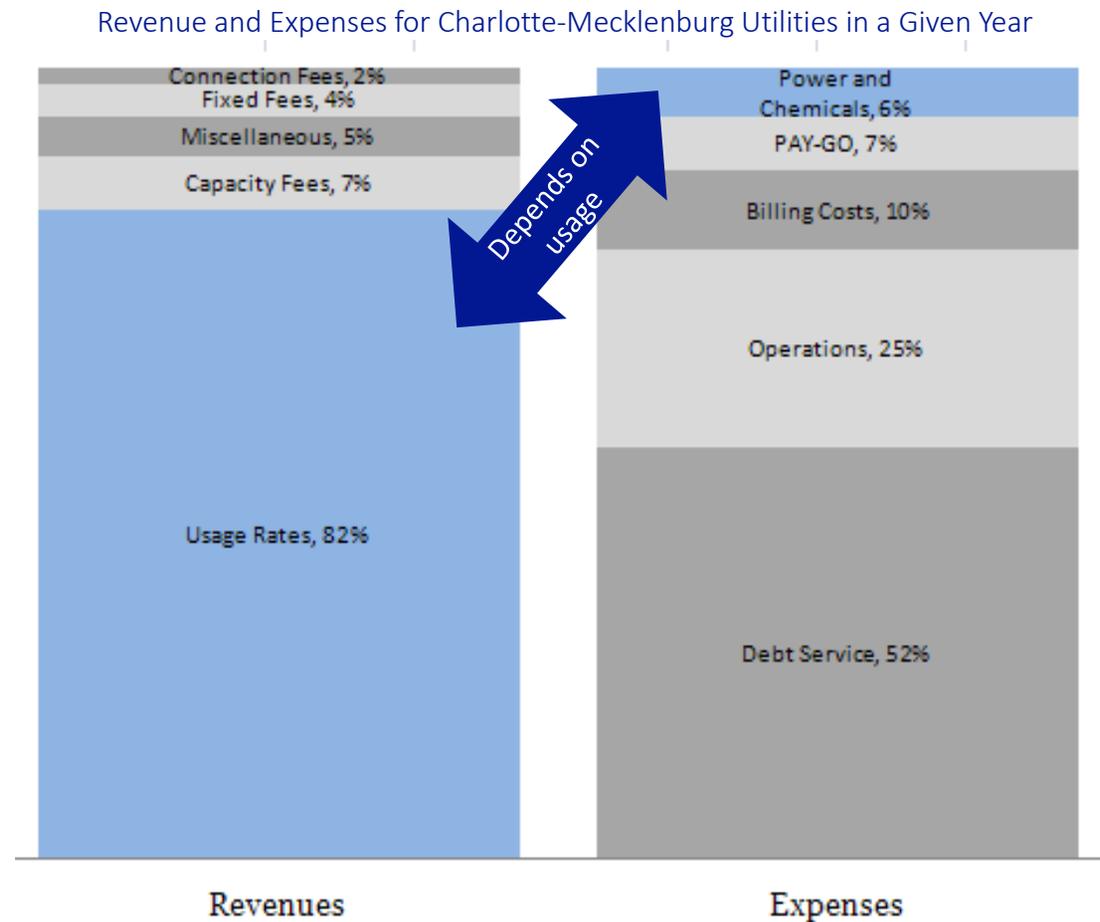


Source: Orange Water & Sewer Authority



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



Free, rate-setting tool using only MS Excel, developed by the Environmental Finance Center at UNC.



Water and Sewer Rates Analysis Model

Version 2.7 (updated March 24, 2014)

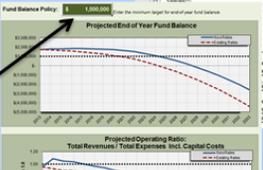
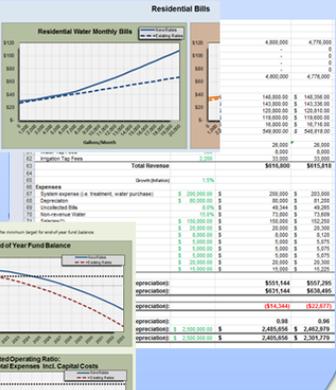
20-year fund balance estimates under proposed new rates vs. existing rates: compare side-by-side
Uniform or block rates Residential and non-residential rates Changes to customers and demands

INSTRUCTIONS

- 1) Click on tabs at bottom of screen to navigate to different pages.

- 2) On the **"Data Input 1"** tab enter current and new rate details in the dark green cells.

Rate Structure		2012	
Residential Rates		Block Start	Block End
Water Base Rate			\$10.00
Block Rate 1 (\$/1,000 gal)	2,001 gal/mo	2,000 gal/mo	\$1.00
Block Rate 2 (\$/1,000 gal)	5,001 gal/mo	5,000 gal/mo	\$2.00
Block Rate 3 (\$/1,000 gal)	7,001 gal/mo	7,000 gal/mo	\$3.00
Block Rate 4 (\$/1,000 gal)	12,001 gal/mo	12,000 gal/mo	\$4.00
Final Block Rate (\$/1,000 gal)	12,001 gal/mo		\$5.00
Sewer Base Rate			\$10.00
Block Rate 1 (\$/1,000 gal)	2,001 gal/mo	2,000 gal/mo	\$1.00
Block Rate 2 (\$/1,000 gal)	5,001 gal/mo	5,000 gal/mo	\$2.00
Block Rate 3 (\$/1,000 gal)	7,001 gal/mo	7,000 gal/mo	\$3.00
Block Rate 4 (\$/1,000 gal)	12,001 gal/mo	12,000 gal/mo	\$4.00
Final Block Rate (\$/1,000 gal)	12,001 gal/mo		\$5.00
- 3) On the **"Data Input 2"** tab enter current consumption levels, utility finances, and other assumptions in the dark green cells.

During FY2013	Starting Fund Balance	FY2013
Existing	Fund Balance at the Beginning of FY2013	\$ 1,750,000
12,235,000 (gall/month)		
5,500 (gall/month)		
1,500,000 (gall/month)	Salaries and Wages, Including Part-Time and Contract	\$ 200,000
3,000,000 (gall/month)	Supplies	8,000
(gall/month)	Utilities	5,000
1,000,000 (gall/month)	Administrative Expenses	5,000
(gall/month)	Lab	5,000
1,200,000 (gall/month)	Routine Repairs & Maintenance	20,000
2,400,000 (gall/month)	Water Purchase	20,000
(gall/month)	Sewage Availability Service	20,000
(gall/month)	Other Treatment & Delivery Expenses	150,000
800,000 (gall/month)	Depreciation of Cash Capital Expenses Excluding Debt Service	100,000
(gall/month)	Miscellaneous Annual Expenses	15,000
1,000,000 (gall/month)		
1,435,000 (gall/month)		
2,500,000 (gall/month)		
- 4) On the **"Charts"** tab, see projections of the End of Year Fund Balance, and input a Fund Balance Policy in the dark green cell at the top of the page.

- 5) Compare new rates to existing rates in **"Compare Monthly Bills"** and their impacts on costs and revenues in **"Existing Rates"** or **"New Rates"**.


Note: This tool models the impact on a utility's fund balance of a one-time increase in rates, rather than an ongoing series of rate increases. Update this tool every year and do not rely on analysis conducted more than one year ago.

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 Funded by the Public Water Supply Section, Division of Water Resources at the NC Department of Environment and Natural Resources, and the U.S. Environmental Protection Agency
 Download the latest version of this tool at <http://efc.sog.unc.edu>. Find it in Resources / Tools.
 Provide feedback or ask questions by emailing Shadi Eskaf at eskaf@sog.unc.edu

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Tool development was funded by the Public Water Supply Section of DWR/ NCDENR and partly by the USEPA.



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

Data Input 1

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.

Data Input Color Explanation:
 White: Data to be entered, can be changed
 Black: Automatically calculated data, do not change!
 Red: Important Results

Residential Rates

Rate Structure		FY: 2012		2013	
		Existing	New	Existing	New
Water Base Rate					
		\$10.00	\$12.00		
Water:					
Block Rate 1 (\$/1,000 gal)	End: gal/mo	\$1.00	\$1.25		
Block Rate 2 (\$/1,000 gal)	gal/mo	\$2.00	\$2.25		
Block Rate 3 (\$/1,000 gal)	gal/mo	\$3.00	\$3.25		
Block Rate 4 (\$/1,000 gal)	gal/mo	\$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)	gal/mo	\$1.00	\$1.25		
Block Rate 2 (\$/1,000 gal)	gal/mo	\$2.00	\$2.25		
Block Rate 3 (\$/1,000 gal)	gal/mo	\$3.00	\$3.25		
Block Rate 4 (\$/1,000 gal)	gal/mo	\$4.00	\$4.25		
Final Block Rate (\$/1,000 gal)		\$5.00	\$5.25		

Commercial Rates

Rate Structure		2012		2013	
		Existing	New	Existing	New
Water Base Rate					
		\$10.00	\$12.00		
Water:					
Block Rate 1 (\$/1,000 gal)	End: gal/mo	\$1.00	\$1.25		
Block Rate 2 (\$/1,000 gal)	gal/mo	\$2.00	\$2.25		
Block Rate 3 (\$/1,000 gal)	gal/mo	\$3.00	\$3.25		
Block Rate 4 (\$/1,000 gal)	gal/mo	\$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)	gal/mo	\$1.00	\$1.25		
Block Rate 2 (\$/1,000 gal)	gal/mo	\$2.00	\$2.25		
Block Rate 3 (\$/1,000 gal)	gal/mo	\$3.00	\$3.25		
Block Rate 4 (\$/1,000 gal)	gal/mo	\$4.00	\$4.25		
Final Block Rate (\$/1,000 gal)		\$5.00	\$5.25		

Irrigation Rates

Rate Structure		2012		2013	
		Existing	New	Existing	New
Irrigation Base Rate					
		\$0.00	\$0.00		
Irrigation:					
Block Rate 1 (\$/1,000 gal)	End: gal/mo	\$3.50	\$3.50		
Block Rate 2 (\$/1,000 gal)	gal/mo				
Block Rate 3 (\$/1,000 gal)	gal/mo				
Block Rate 4 (\$/1,000 gal)	gal/mo				
Final Block Rate (\$/1,000 gal)					

Tap Fees

Rate Structure		2012		2013	
		Existing	New	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		

Number of Accounts

		2012 Existing	2013 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%

Converters

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*

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



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
- Georgia Environmental Protection Division (2007). *Conservation-Oriented Rate Structures.*
http://www1.gadnr.org/cws/Documents/Conservation_Rate_Structures.pdf