Pricing Water to Achieve Full Cost Recovery

Glenn Barnes

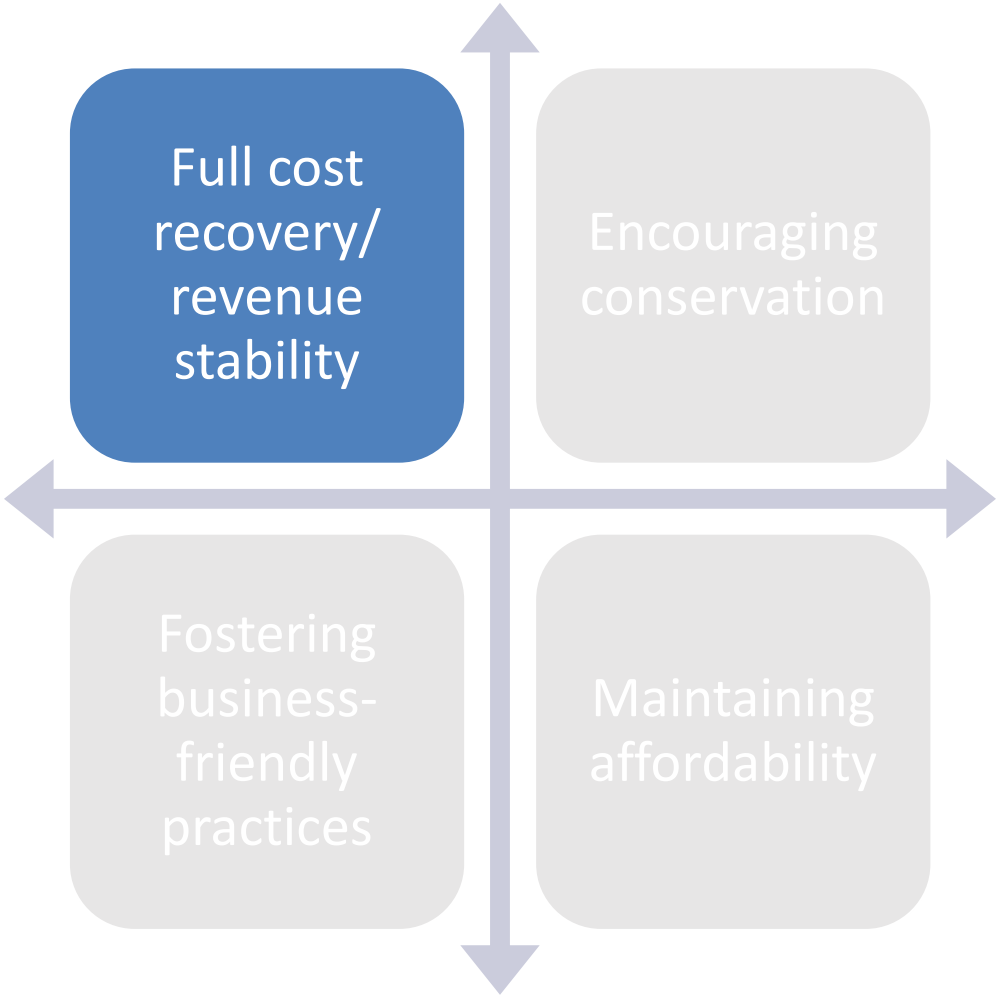
Environmental Finance Center

The University of North Carolina at Chapel Hill

919-962-2789

glennbarnes@sog.unc.edu

Rate Setting Objectives



UNC ENVIRONMENTAL FINANCE CENTER

Northeast IL Water and Wastewater Rates Dashboard

Rates as of January 1, 2017

Dashboard updated: February 17, 2017

Smart Management for Small Water Systems

*** Example Utility (Demonstration Only)

Rates Comparison | Characteristics | Links | Edit Data or Add Utility

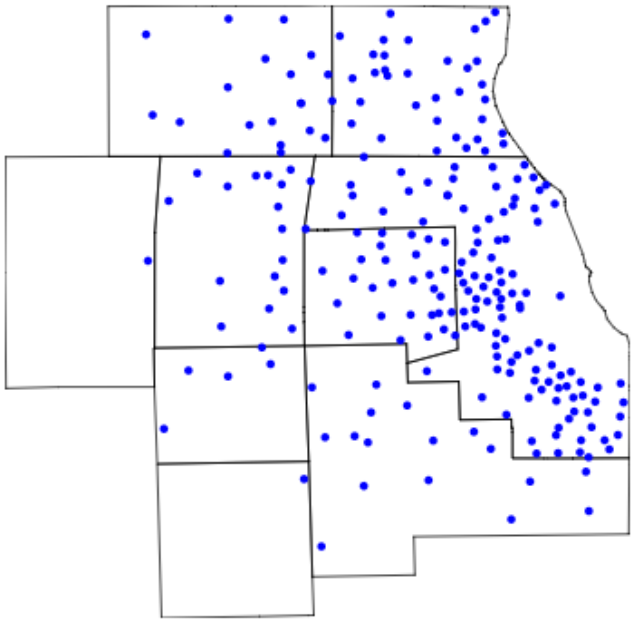
Select residential bill and monthly consumption amount

Water Bill | **Sewer Bill** | **Water + Sewer Bill**

5,000 gallons
668 cubic feet

Monthly Water Bill: $33.94

Comparing to **all utilities in survey**

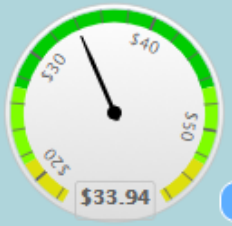


233 rate structures compared

Effects of raising rates by: 0%

Bill Comparison

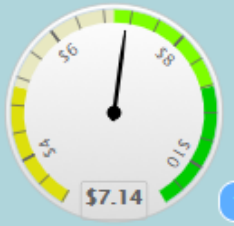
Water Bill at 5,000 gallons
Median: $33.60



Min $3.03 Max $122.72

Conservation Signal

Water Price/1,000 gallons, after 10,000 gallons
Median: $6.68



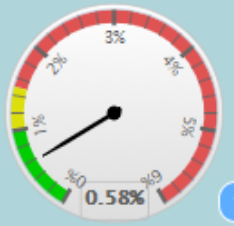
Min $0.00 Max $23.93

Cost Recovery

Operating Ratio Incl. Deprec. 2016

Affordability

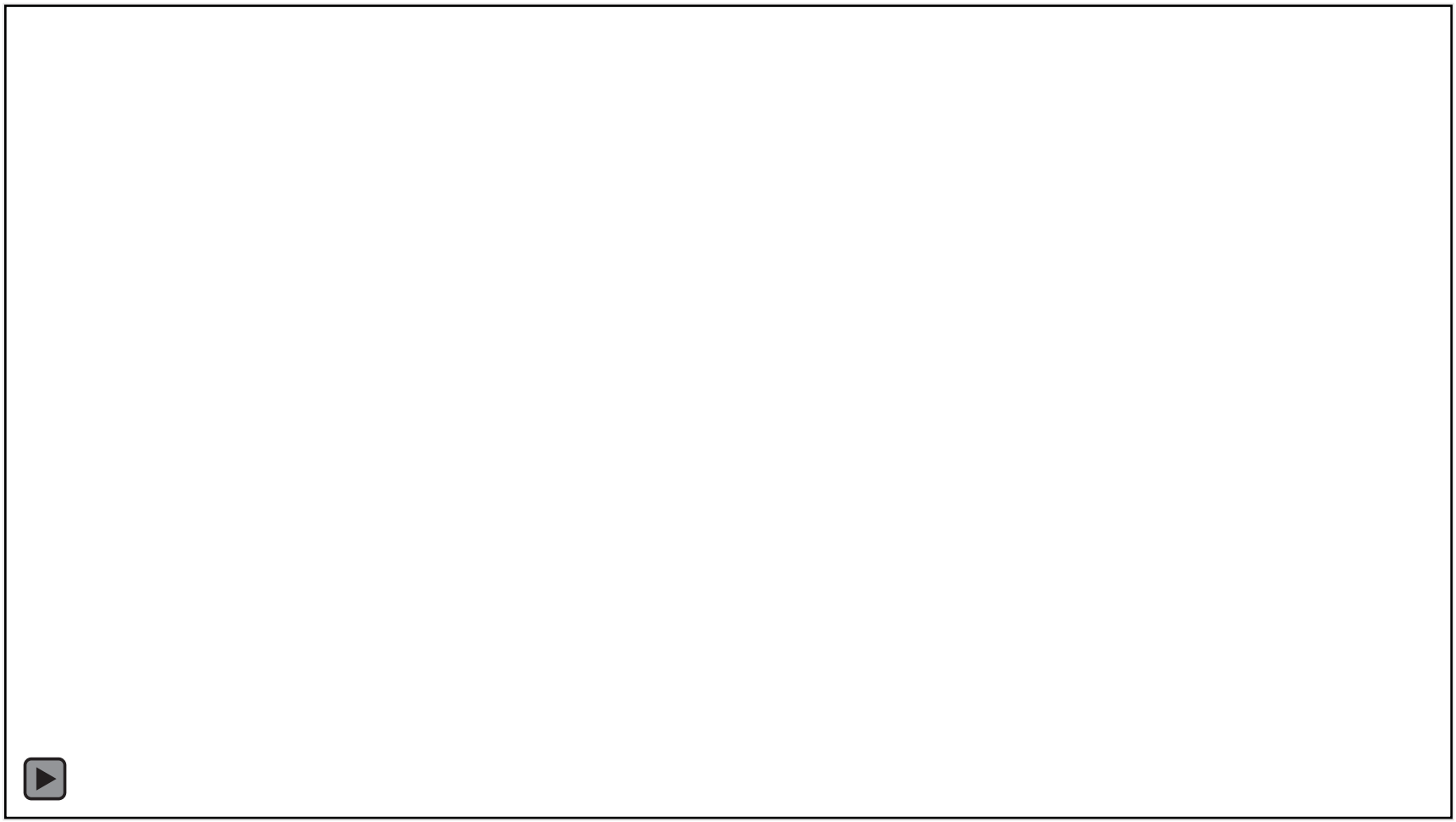
Water Bills as % MHI



Session Objectives

- Understand how to calculate the base charges and volumetric charges to cover the full cost of providing water service
- Discuss what factors can impact

Understanding Water Revenues



https://www.youtube.com/watch?v=0jf83mE0Lyk

Full Cost Pricing

- The goal of full cost pricing is to have the charges for water cover the entire cost of running the water system today and into the future

- Of course, there are many ways in which you can get to the right dollar figure. Some of it comes down to your rate setting philosophy

Rate Setting Philosophies

- Payment for access vs. payment for volume of product received
- Fixed charges for fixed costs and variable charges for variable costs
- Some mix of the above ideas

Exercise

Let’s figure out some rates for Irvindale that cover the full cost of providing water service

Non-Rate Revenues

	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

For the Exercise

Total Revenues:

$382,932.87

Revenues from Rates:

$344,445.00

Payment for Access

- In its pure form, everyone in the water system pays the same amount for access to the system, regardless of how much water they use

Payment for Access

We charge a flat rate of $ 15.00 monthly

P.O - Box 133
Jacksonville

We are a small town we do not have sewage

Jacksonville, GA

Payment for Access

- What information do we need to make this calculation?

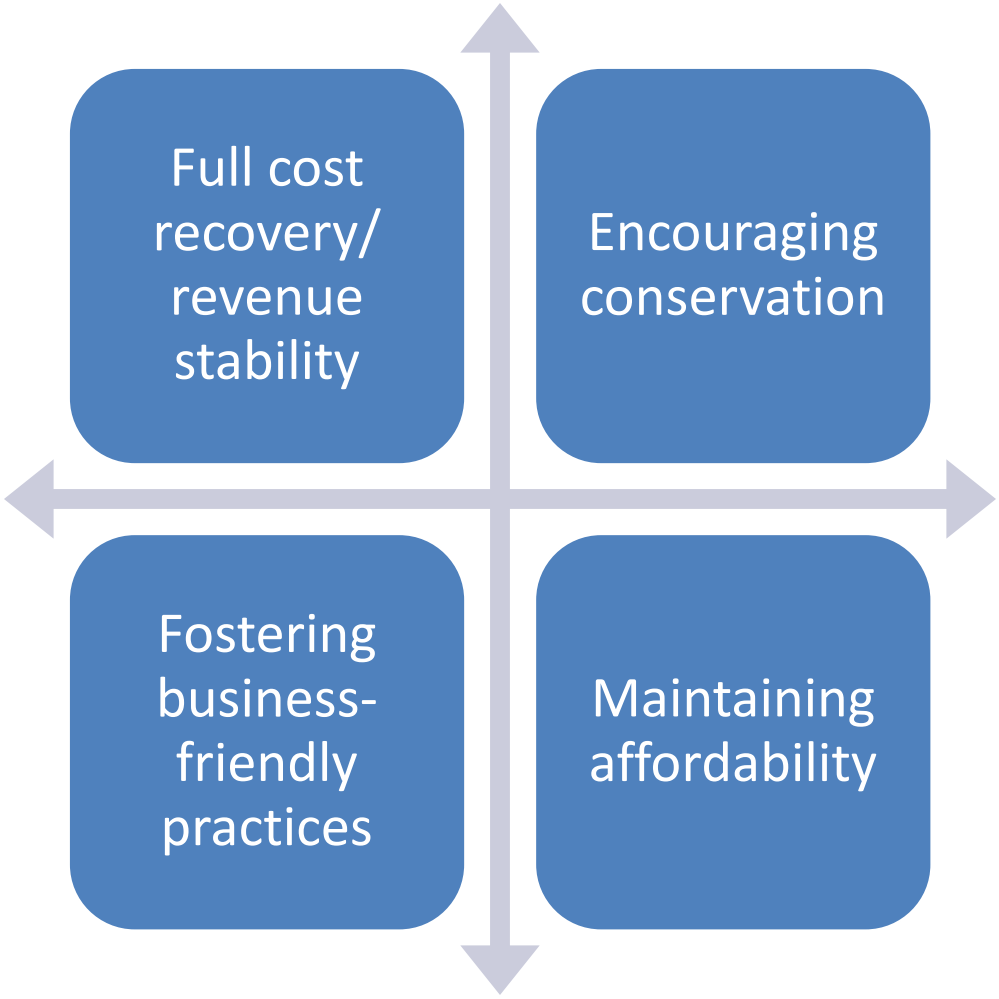
- Total revenue needed from rates
- Total number of accounts

Payment for Access

$$\frac{\$344{,}445.00}{450} = \frac{\$765.43}{12} = \$63.79$$

Total Needed Revenue / Total Accounts = Total Annual Bill / 12 = Monthly Bill

Which Rate Setting Objectives?



Payment for volume of product received

- In its pure form, everyone in the water system pays for the volume of water received and only for the volume of water received

Payment for volume of product received

WATER & SEWER RATES

In Town	
Water	$ 7.72 per 1000 gallons
Sewer	$ ~~10.73~~ per 1000 gallons
Out of Town	
Water	$ 15.44 per 1000 gallons
Sewer	$ 21.46 per 1000 gallons

Troutman, NC

Payment for volume of product received

- What information do we need to make this calculation?

- Total revenue needed from rates
- Total gallons sold

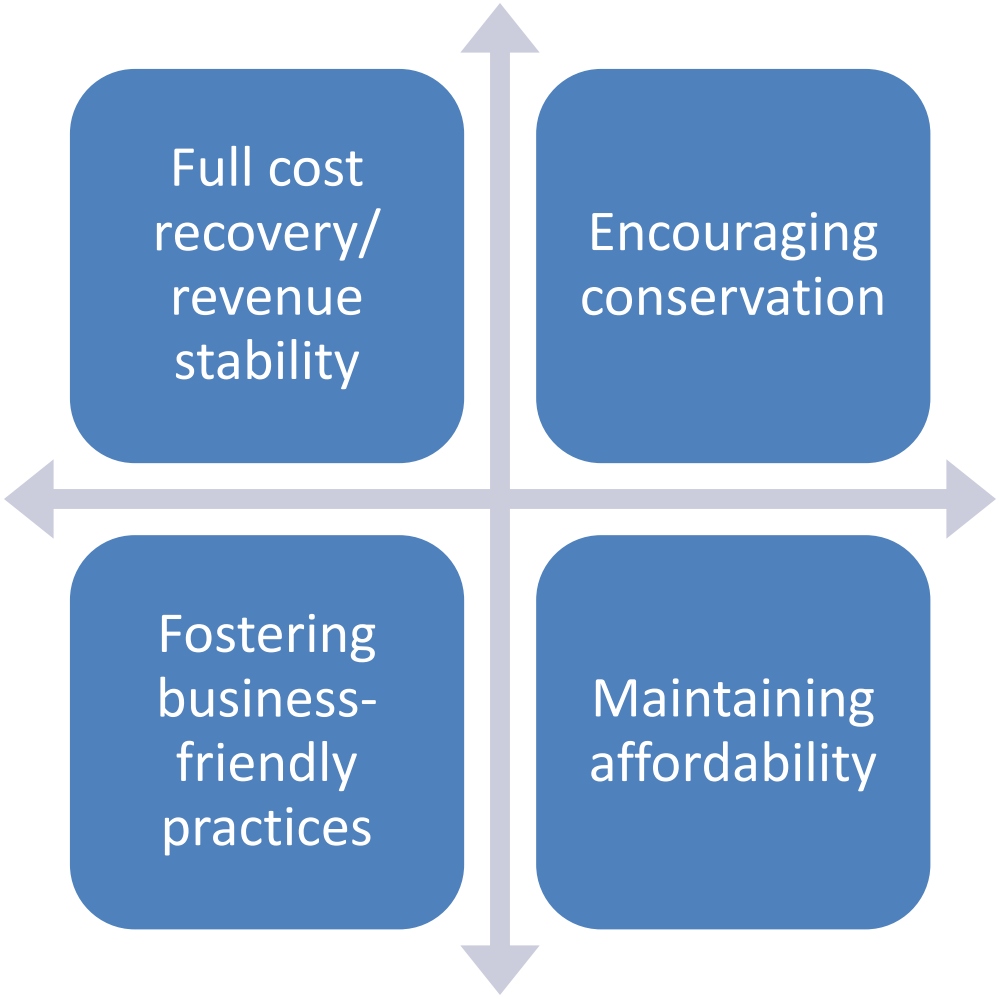
Payment for volume of product received

$$\frac{\$344,445.00}{32,877,590} \times 1{,}000 = \$10.48$$

Total Needed Revenue / *Total Gallons*

Price per 1,000 Gallons

Which Rate Setting Objectives?



Base Charge for Fixed Costs; Volumetric Charge for Variable Costs

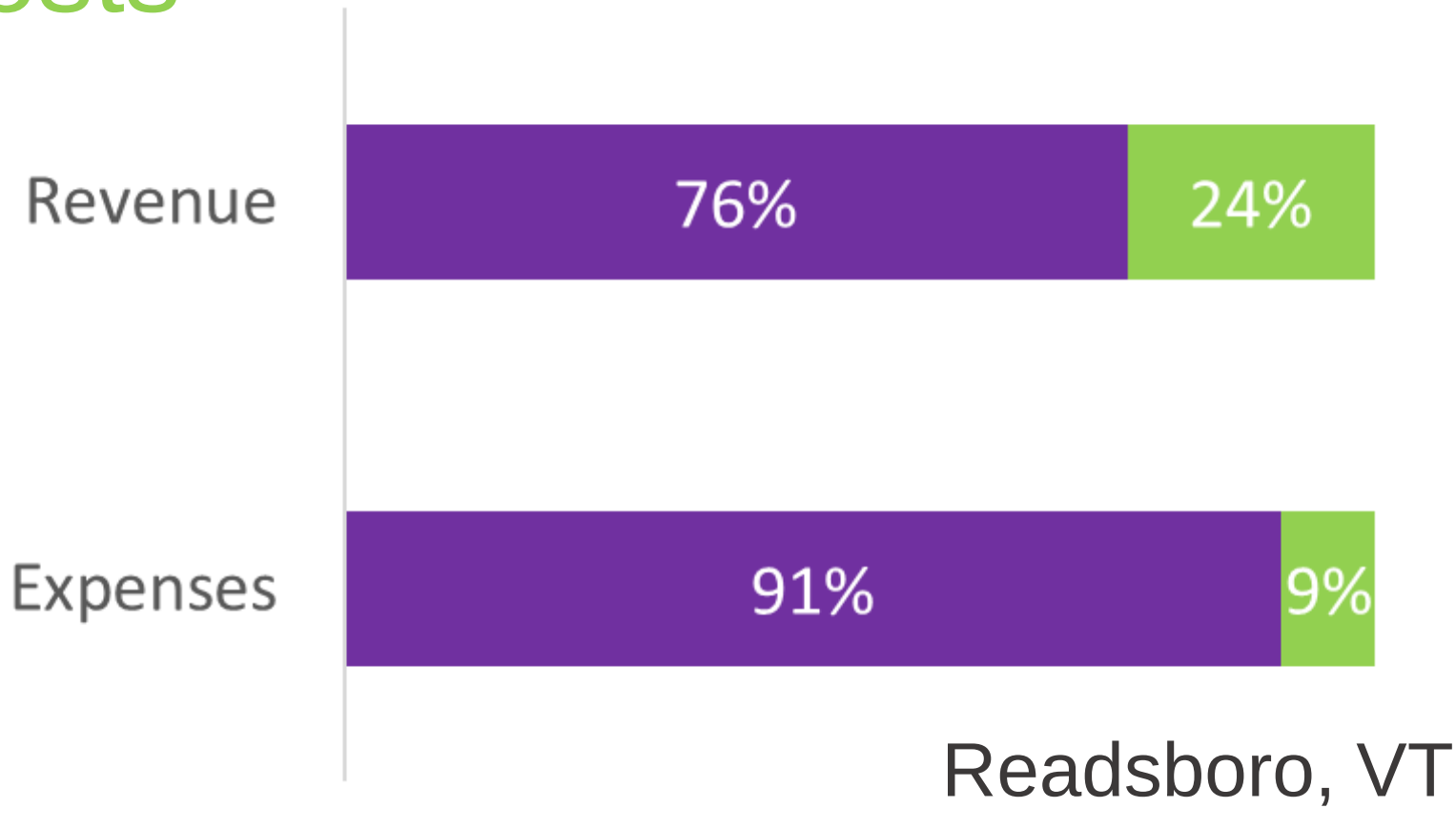
- In its pure form, all of the fixed costs of the water system would be covered by the base charge, and all of the variable costs would be covered by the volumetric rate

Base Charge for Fixed Costs; Volumetric Charge for Variable Costs

Base Chrg	Lower Bound	Rate
38.00	0	0.000000
	4	9.500000

Readsboro, VT

Base Charge for Fixed Costs; Volumetric Charge for Variable Costs



Readsboro, VT

Base Charge for Fixed Costs; Volumetric Charge for Variable Costs

- What information do we need to make this calculation?

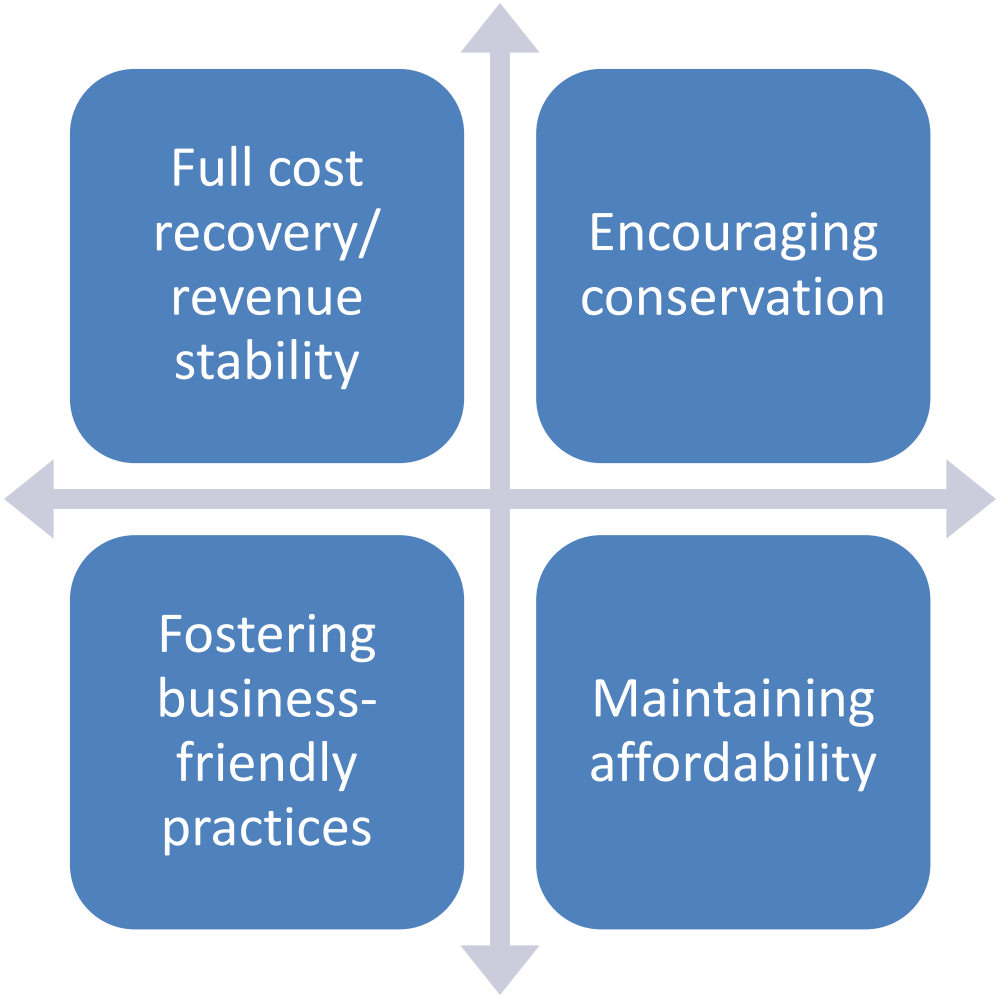
- Total revenue needed to cover fixed costs
- Total Accounts
- Total revenue needed to cover variable costs
- Total gallons sold

Base Charge for Fixed Costs; Volumetric Charge for Variable Costs

$292,045 (Fixed Annual Cost) / 450 (Total Accounts) = $648.99 (Total Annual Bill) / 12 = $54.08 (Monthly Base Bill)

$52,400 (Variable Annual Costs) / 32,877,590 (Total Gallons) x 1,000 = $1.59 (Price per 1,000 Gallons)

Which Rate Setting Objectives?



$25 Base Charge; Rest from Volumetric Rates

- Randomly pick a base charge and see what the volumetric charge would need to be

$25 Base Charge; Rest from Volumetric Rates

WATER & SEWER RATES AND FEE SCHEDULE EFFE

	IN TOWN
WATER MINIMUM (1000 GALLONS)	$25.00
SEWER MINIMUM (1000 GALLONS)	$25.00
DISPOSAL FEE	$ 5.00
ADDITIONAL WATER PER 1000 GALLONS	$ 6.15

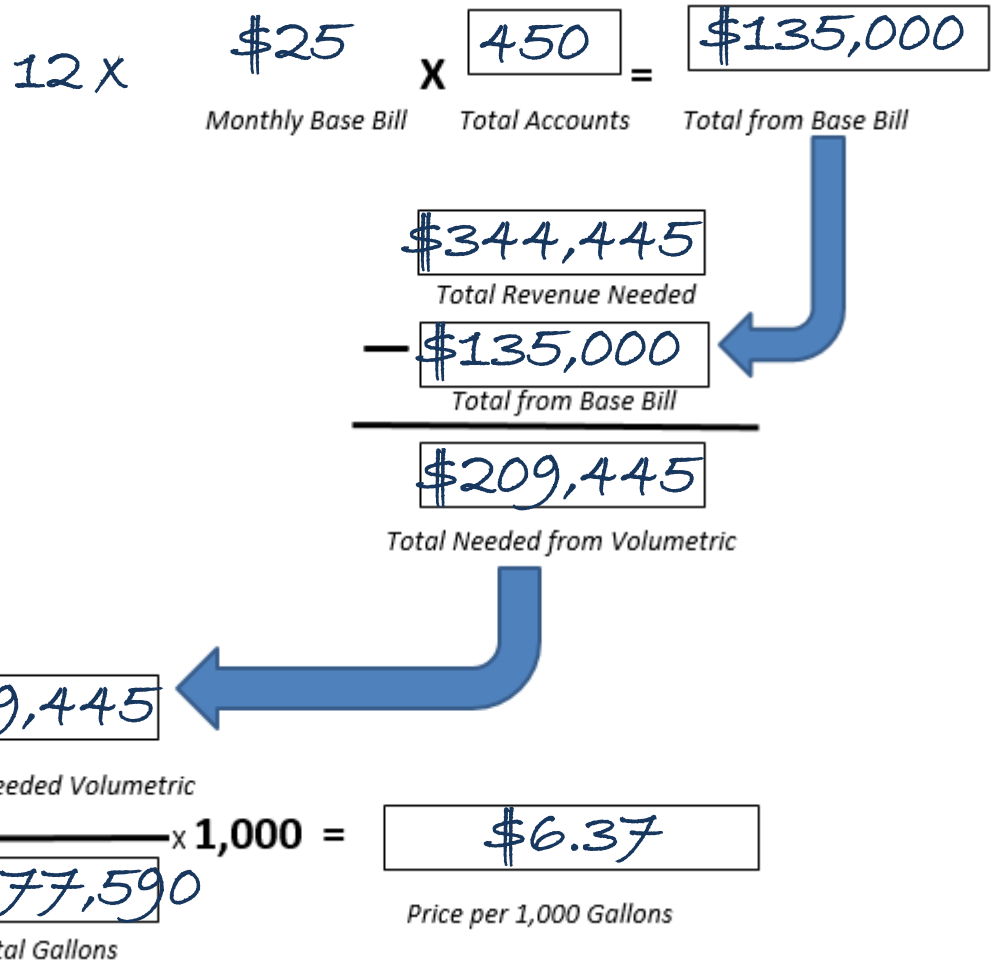
Denton, NC

$25 Base Charge; Rest from Volumetric Rates

- What information do we need to make this calculation?

- Total Accounts
- Total Revenue Needed
- Total Gallons

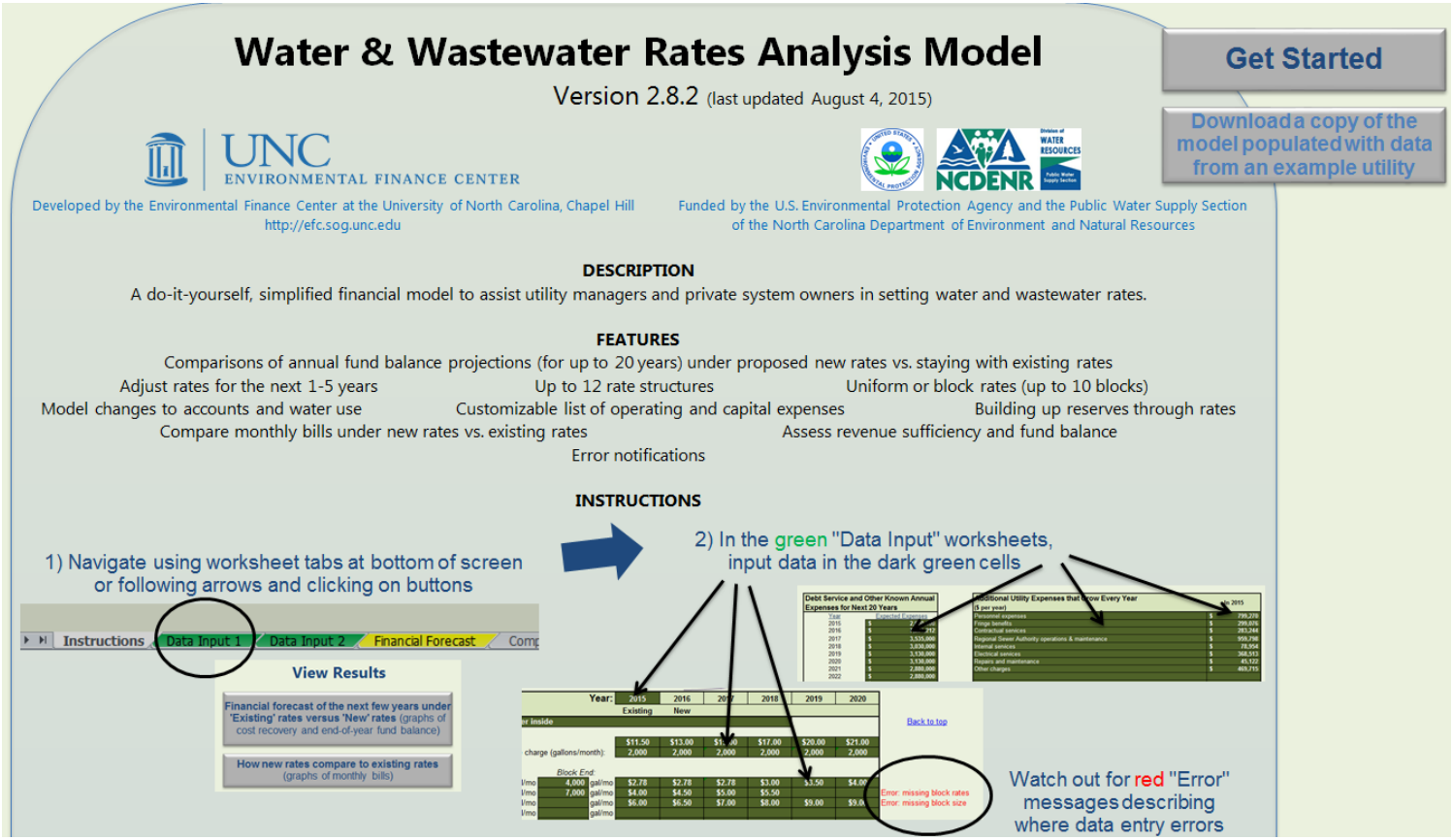
$25 Base Charge; Rest from Volumetric Rates



Water and Wastewater Rates Analysis Model

http://efc.sog.unc.edu or http://efcnetwork.org

Find the most up-to-date version in Resources / Tools



Created by the Environmental Finance Center at the University of North Carolina, Chapel Hill
Funded by the U.S. E.P.A. and the N.C. Department of Environment and Natural Resources

These numbers are based on Irvindale's budget.

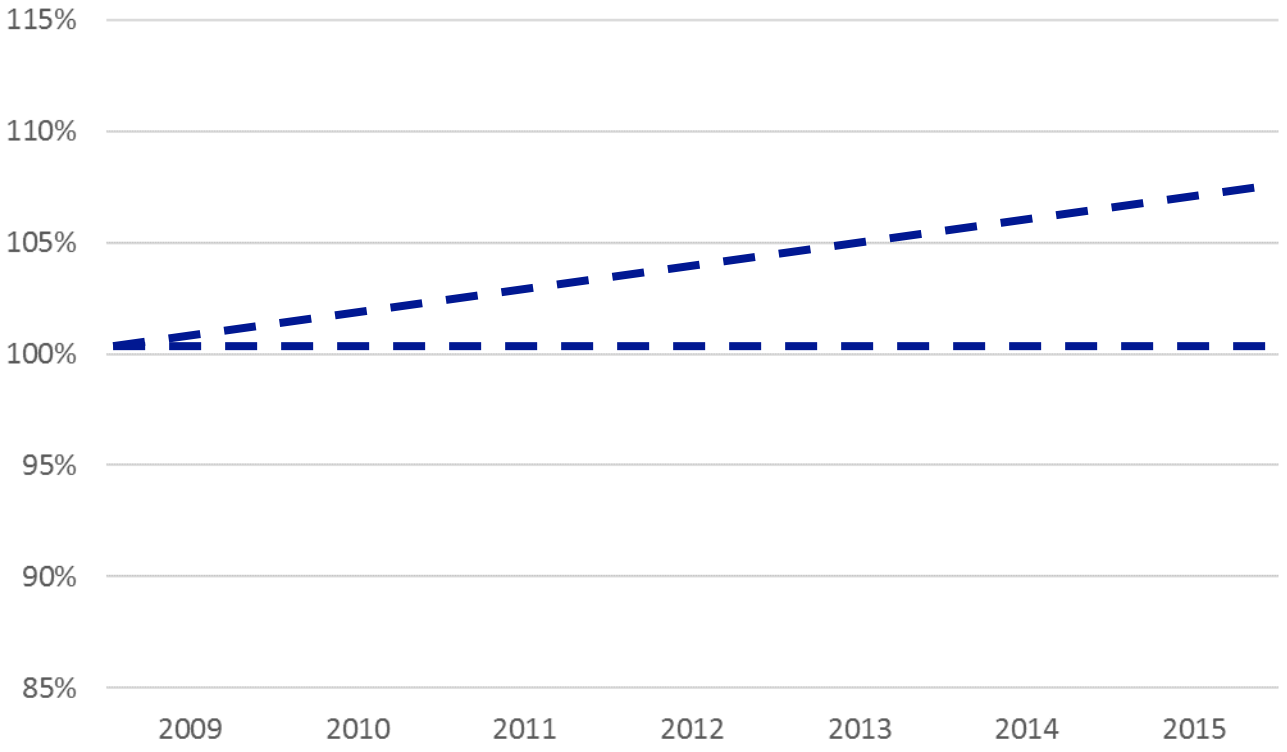
Does budget = reality?

These numbers are based on Irvindale's budget

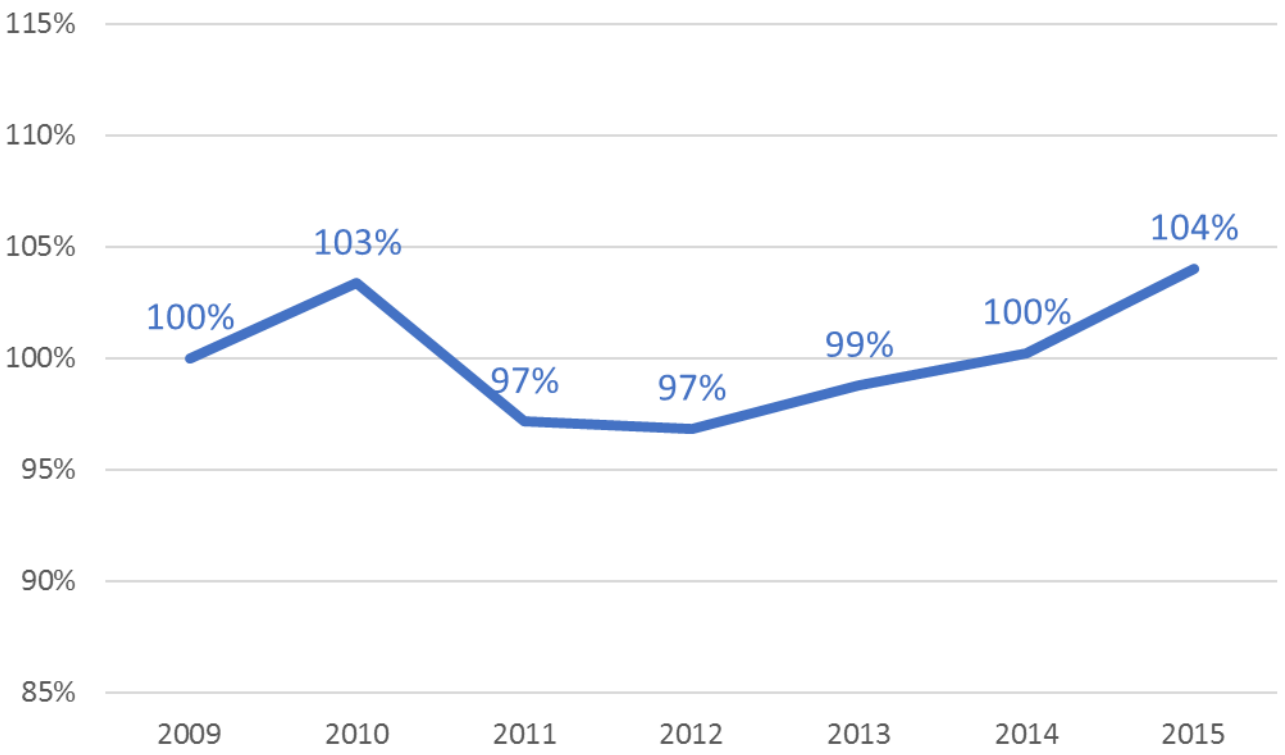
Does

Maybe

Consider the annual revenues of a small water and wastewater system that has not changed its rates in 7 years (real life example)



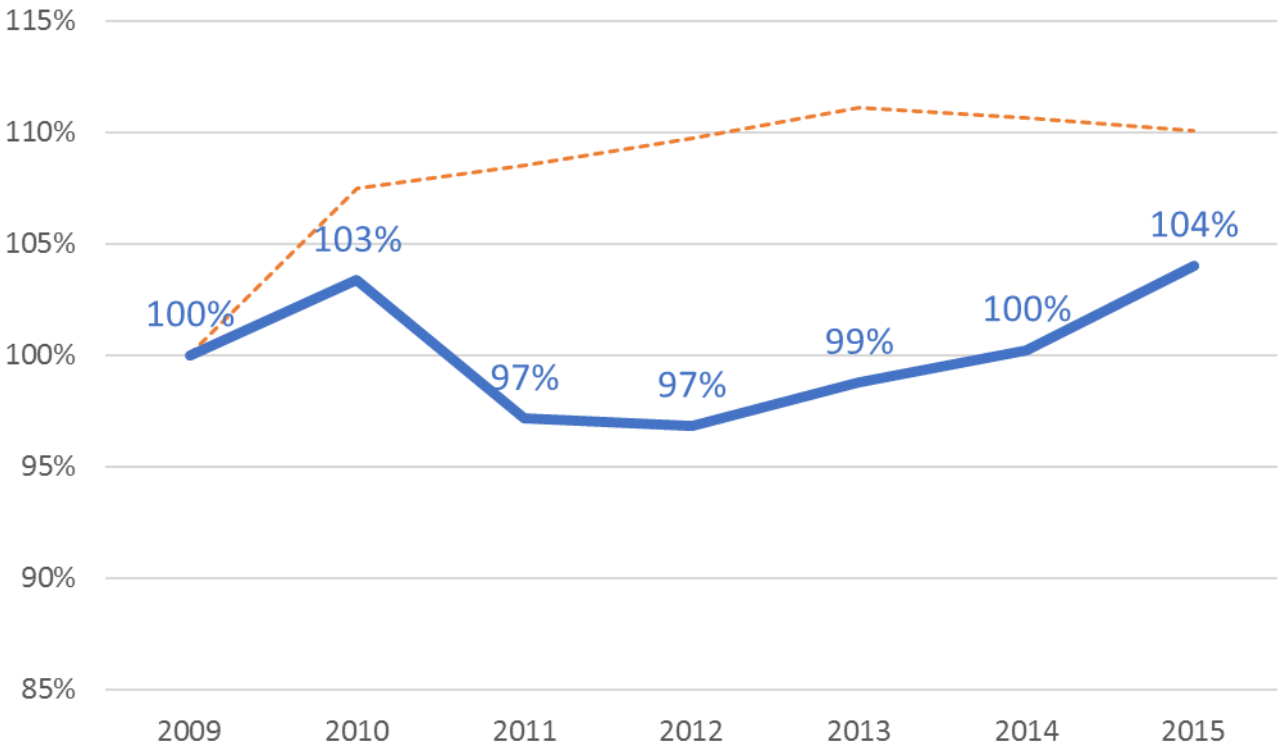
Operating revenues from a small municipal water and wastewater system fluctuated every year, despite water and wastewater rates not changing for those seven years



Total operating revenues of the water and wastewater enterprise fund in each fiscal year are compared to the FY2009 total. Certified municipal population estimate in each year is compared to the 2009 estimate.
Data sources: Annual audited financial statements of a municipality in North Carolina, compiled by the NC Local Government Commission; and certified municipal population estimates by the State Demographic branch of the NC Office of State Budget and Management. Data graphed by the Environmental Finance Center at the University of North Carolina, Chapel Hill.

Operating revenues from a small municipal water and wastewater system fluctuated every year, despite water and wastewater rates not changing for those seven years

And despite municipal population growing over time



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What could be causing this variation?

Rate Changes

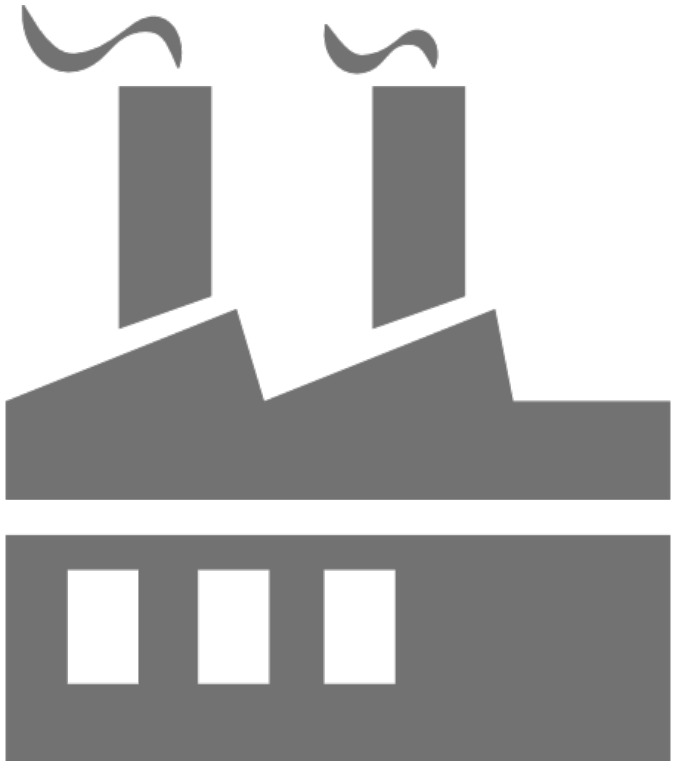
As rates go up, usage goes down

As a rule of thumb, typically usage goes down 3-4% for every 10% increase in rates

Population Change

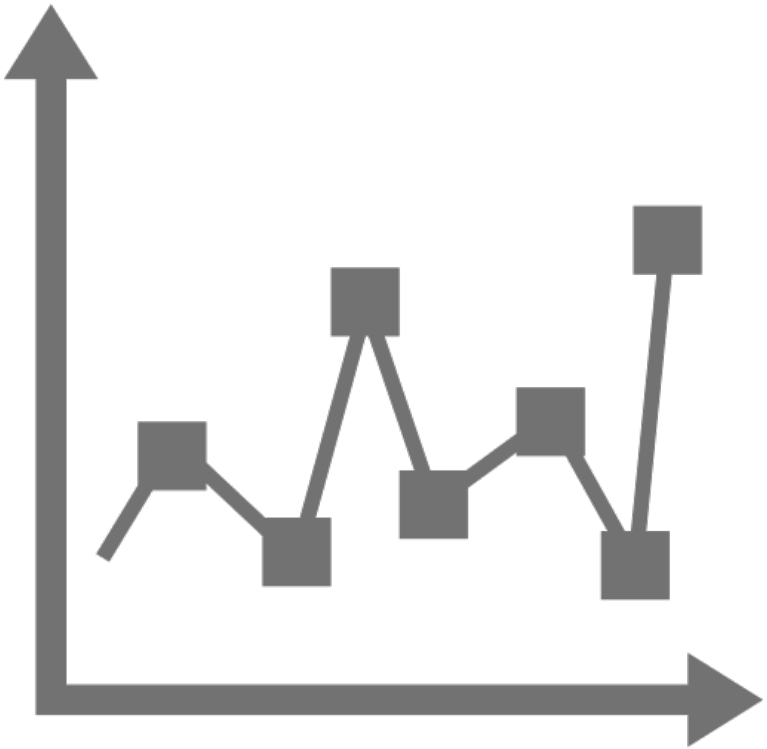
Customers could be coming into your system or leaving your system

Loss of a Big Customer



Some customers use significantly more water than others. Losing a single big user can have a disproportionate impact on revenues

Economic Conditions



Economic downturns can cause customers to cut back on water use. Conversely, periods of economic growth can lead to higher water consumption

Changes in Collection Rates

Even if the number of customers doesn’t change, how often they are paying you may be changing

Weather

Rainy conditions or dry/drought conditions can impact how much water customers use for outside irrigation

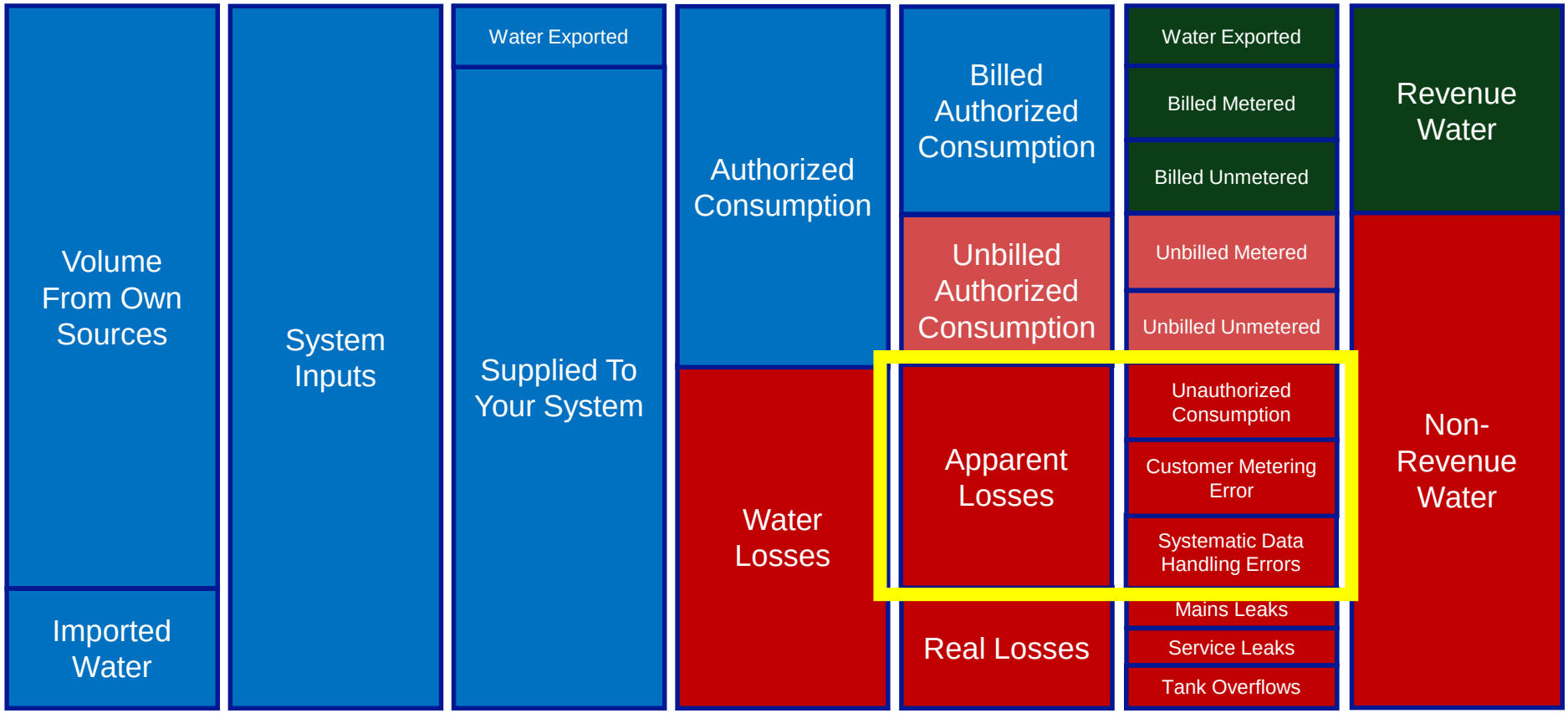
Water Use Restrictions

Whether due to water supply shortages or drought conditions, restricting water use will obviously impact revenues

Technology

Fixtures use less water today than in the past, and overall per capita water demand is decreasing across the country

Bill Correctly



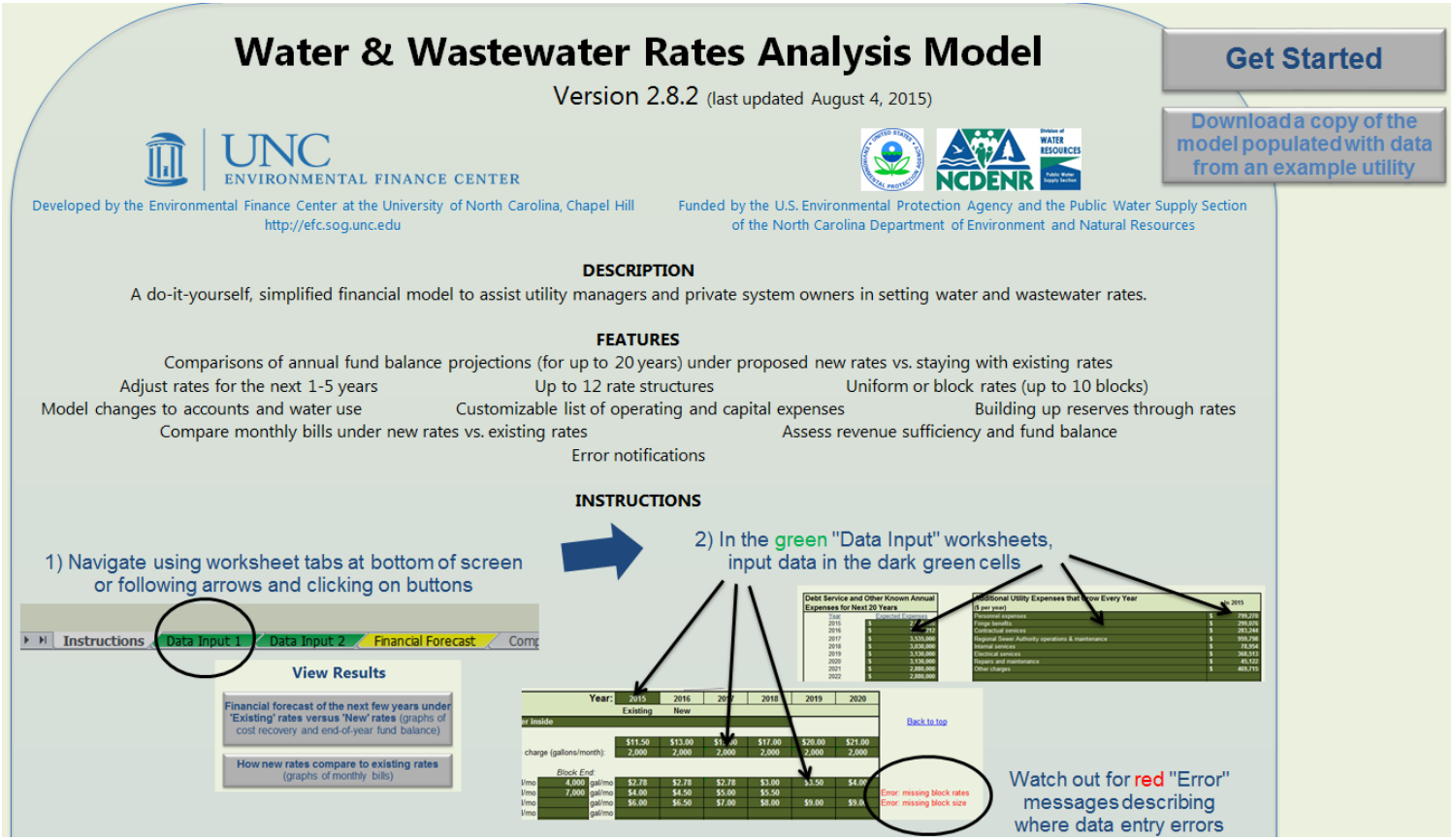
What to do?

- Multiple forecasts based on different assumptions
- Ideally, be conservative

Water and Wastewater Rates Analysis Model

http://efc.sog.unc.edu or http://efcnetwork.org

Find the most up-to-date version in Resources / Tools



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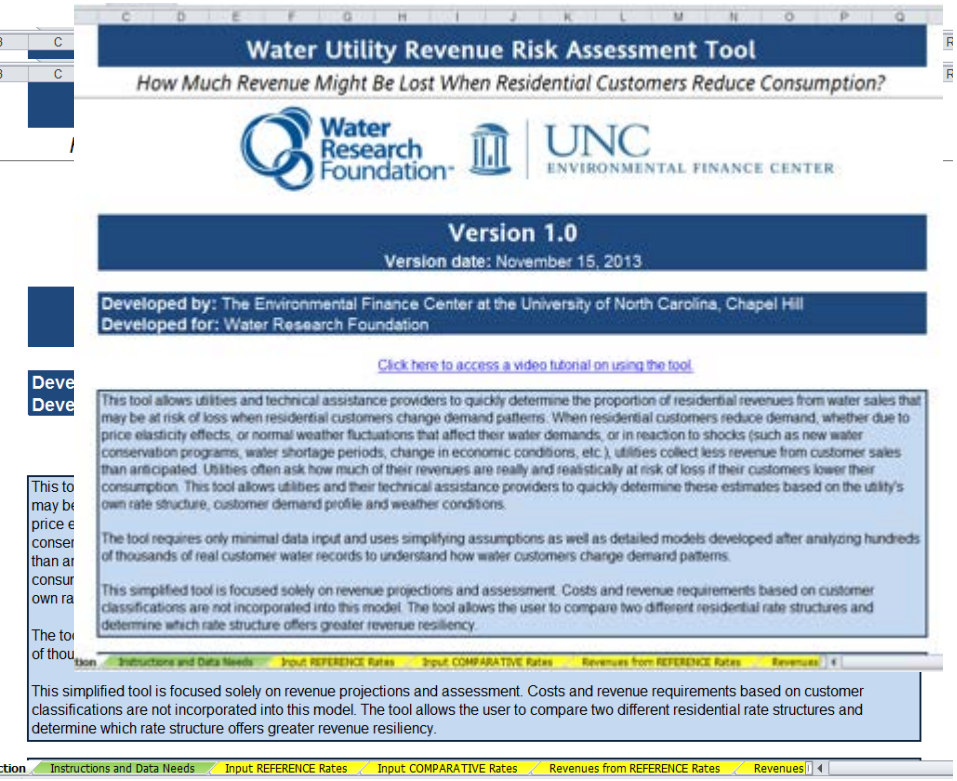
Water Utility Revenue Risk Assessment Tool



Free to download and use at

www.waterrf.org

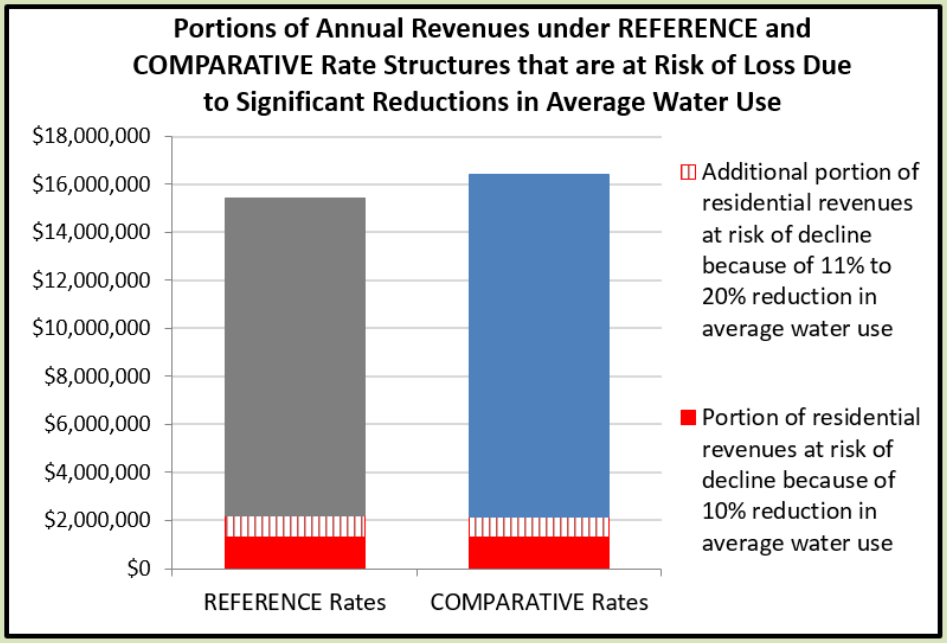
www.efc.sog.unc.edu

- Excel tool (simplified)
- Focus on residential revenues
- Utility inputs own:
  - Rate structure details
  - Residential customer water use profile
  - Weather patterns
  - Assumptions on price elasticity
- Tool estimates the proportion of revenues that may be lost due to changes in water use patterns due to:
  - Rate increase, alone or plus:
  - Normal weather pattern changes, or
  - One-time, significant and sudden conservation effort

Water Utility Revenue Risk Assessment Tool

Comparing Revenues After a Significant Decline in Water Use

How do the total revenues compare under both rate structures if there is a reduction of 10% - 20% in average water use and subsequent demand distribution shifts?

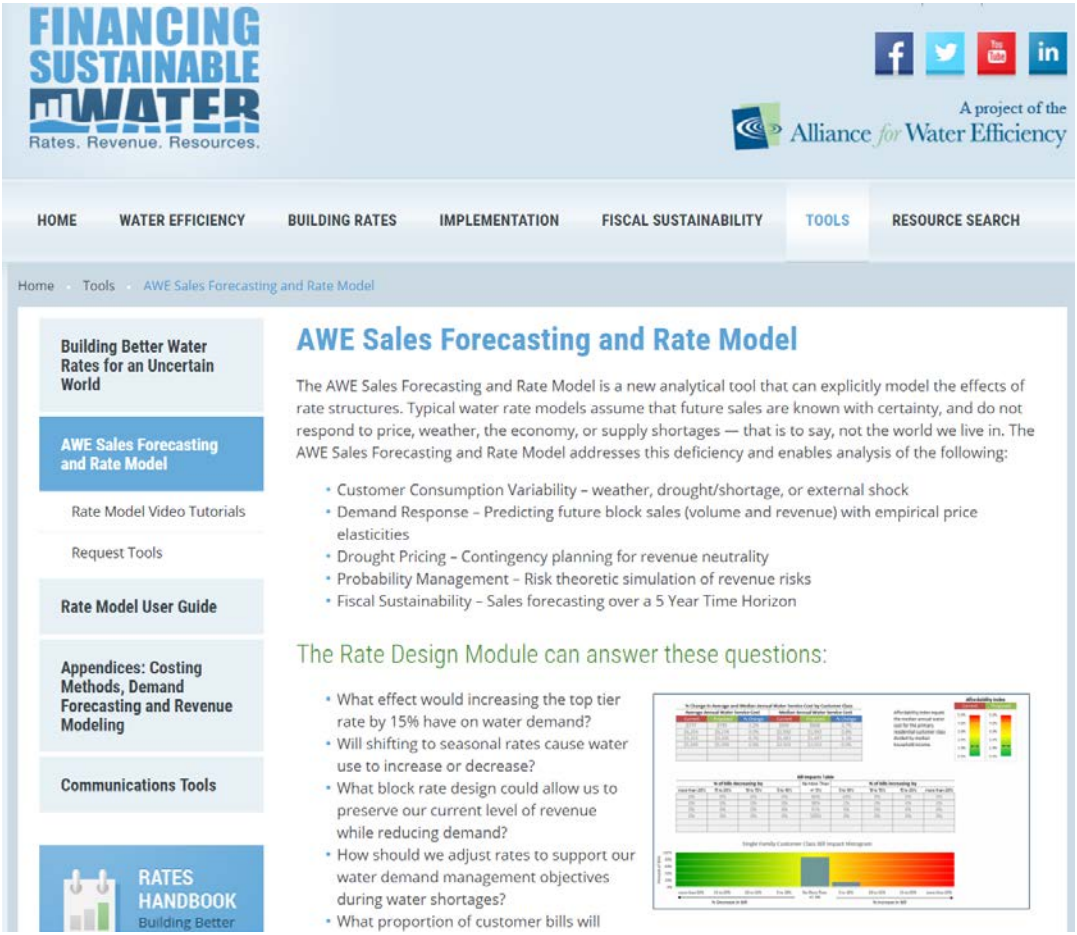


Decline in Total Annual Revenues for a:	REFERENCE Rates	COMPARATIVE Rates
10% reduction in avg use	$1,311,000	$1,319,000
20% reduction in avg use	$2,181,000	$2,167,000
10% reduction in avg use	8.5%	8.0%
20% reduction in avg use	14.2%	13.2%

The comparative rate structure generates revenues that are MORE resilient to sudden and significant declines in residential water use than the revenues generated by the reference rate structure. Revenues under the comparative rate structure are projected to drop 8% - 13.2% for a 10% - 20% reduction in average water use, and their related shifts in demand distribution. These declines occur after including the effect of price elasticity when adjusting rates from the reference rate structure to the comparative rate structure. By comparison, revenues under the reference rate structure are projected to drop 8.5% - 14.2% for the same declines in residential water use.

AWE Sales Forecasting and Rate Model

Available for
Alliance for Water Efficiency members
http://www.financingsustainablewater.org/



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