



Pricing Water for Conservation

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The Problem with Conservation

- We are in the business of selling water
- If we want customers to use less water, what impact does that have on our revenues?
- Let's take a quick overview of costs and revenues



Three Types of Costs

- **Operating Costs**—what you need to run the system day in and day out
- **Capital Costs**—rehabilitation and replacement of existing infrastructure and new infrastructure
- **Debt Service**—what you owe on loans and bonds



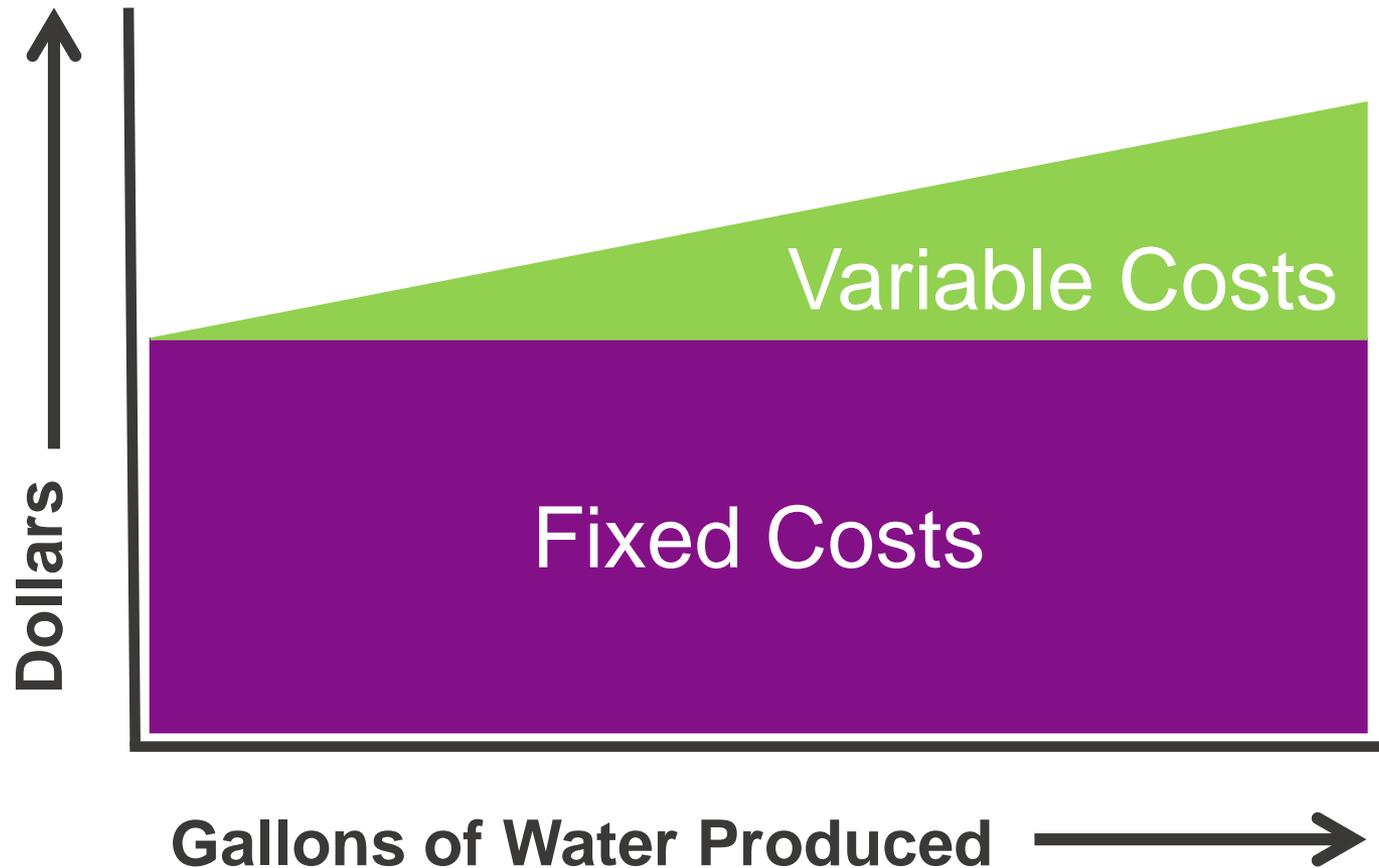
Fixed
Cost



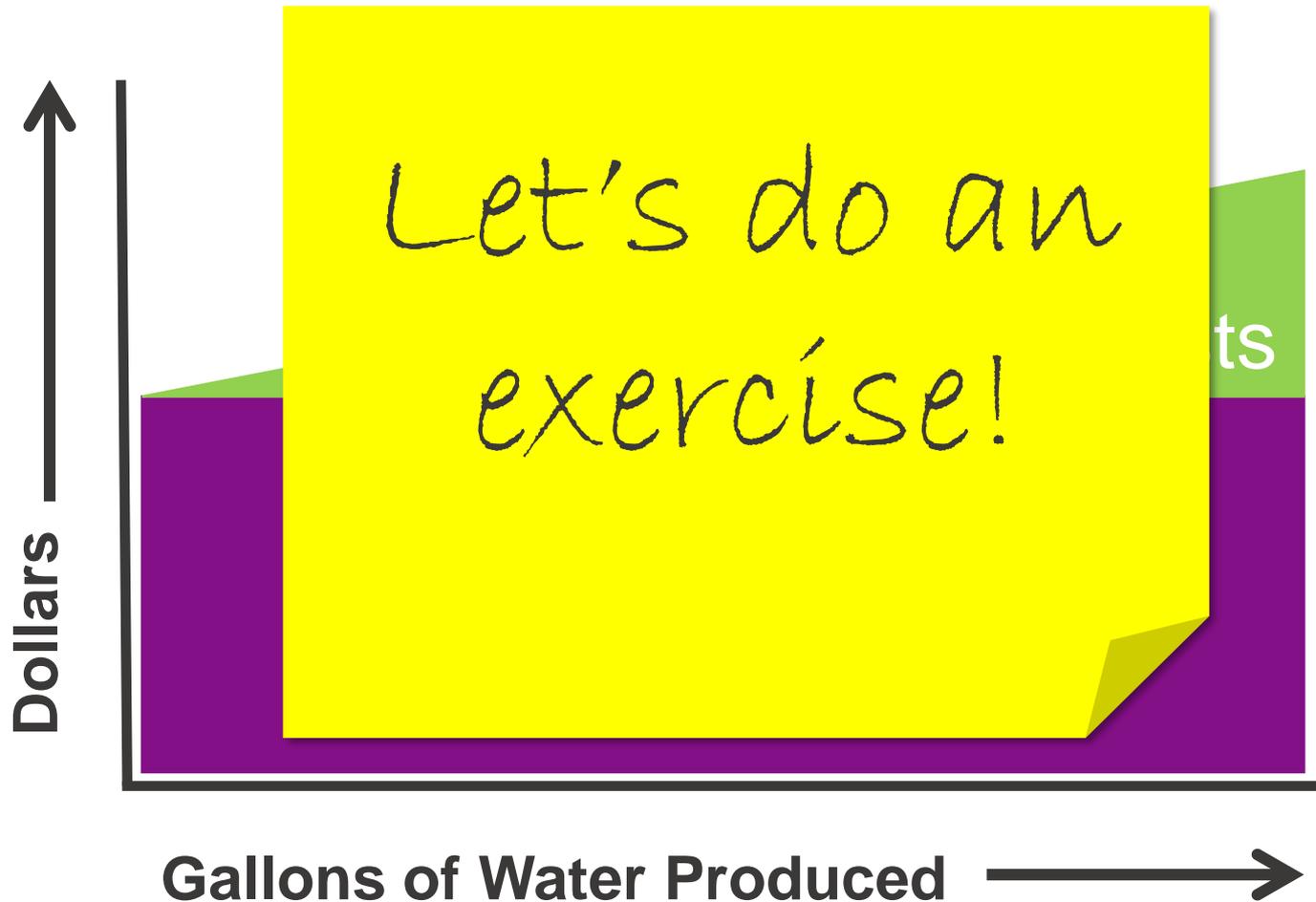
Variable
Cost

- Some costs for a water system are **fixed** regardless of the volume of water treated.
- Others **vary** based on the amount of water treated.
- Others are somewhere **in between**

Costs Can be Fixed or Variable



But Which Costs are Which?





Two Types of Revenues

- **System Income**—Money from rates, tap fees, system development charges, grants, penalties, other sources
- **Debt**—Money from bonds and loans



Understanding Water Revenues

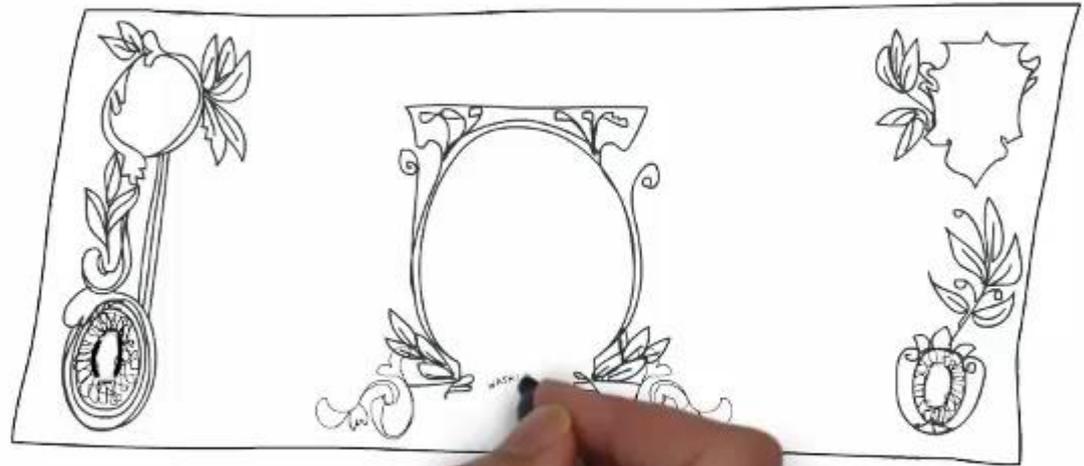
Most of the revenue for your water system comes from what you charge customers

- Base bill
- Volumetric charge

A short video...

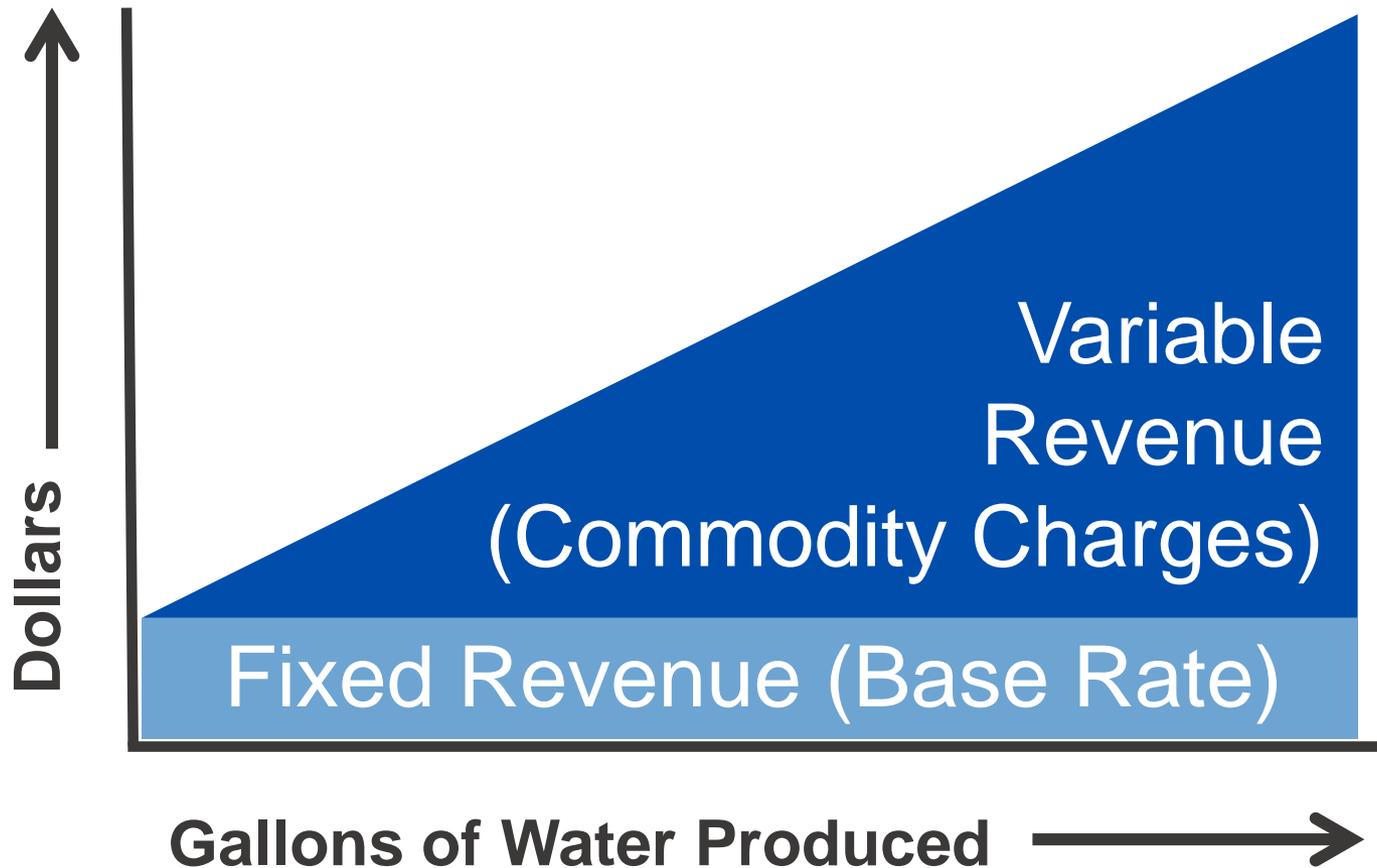
Understanding Water Revenues

**How
Utilities
Generate
Revenue**



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

The Revenue Picture

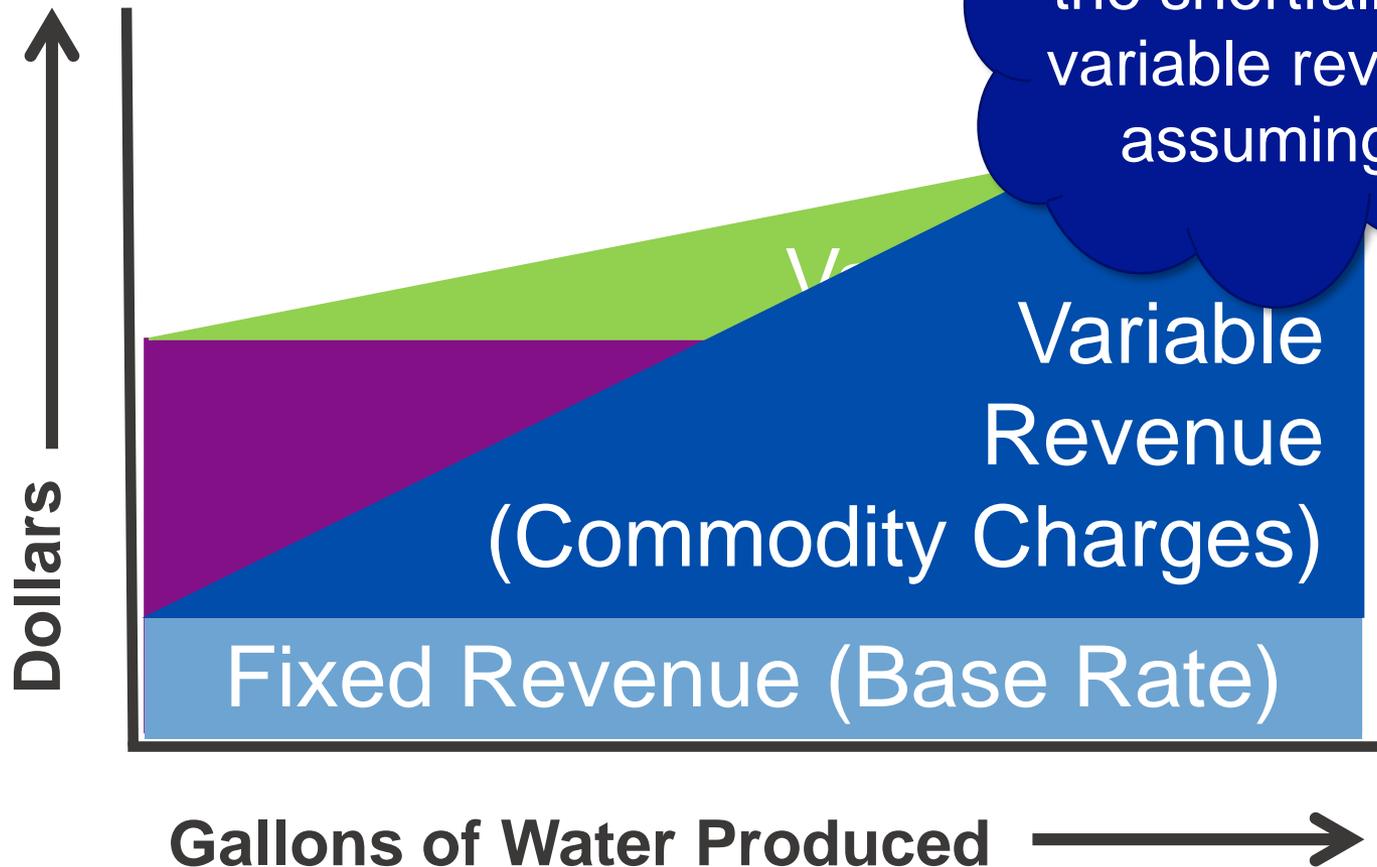


Costs vs. Revenues

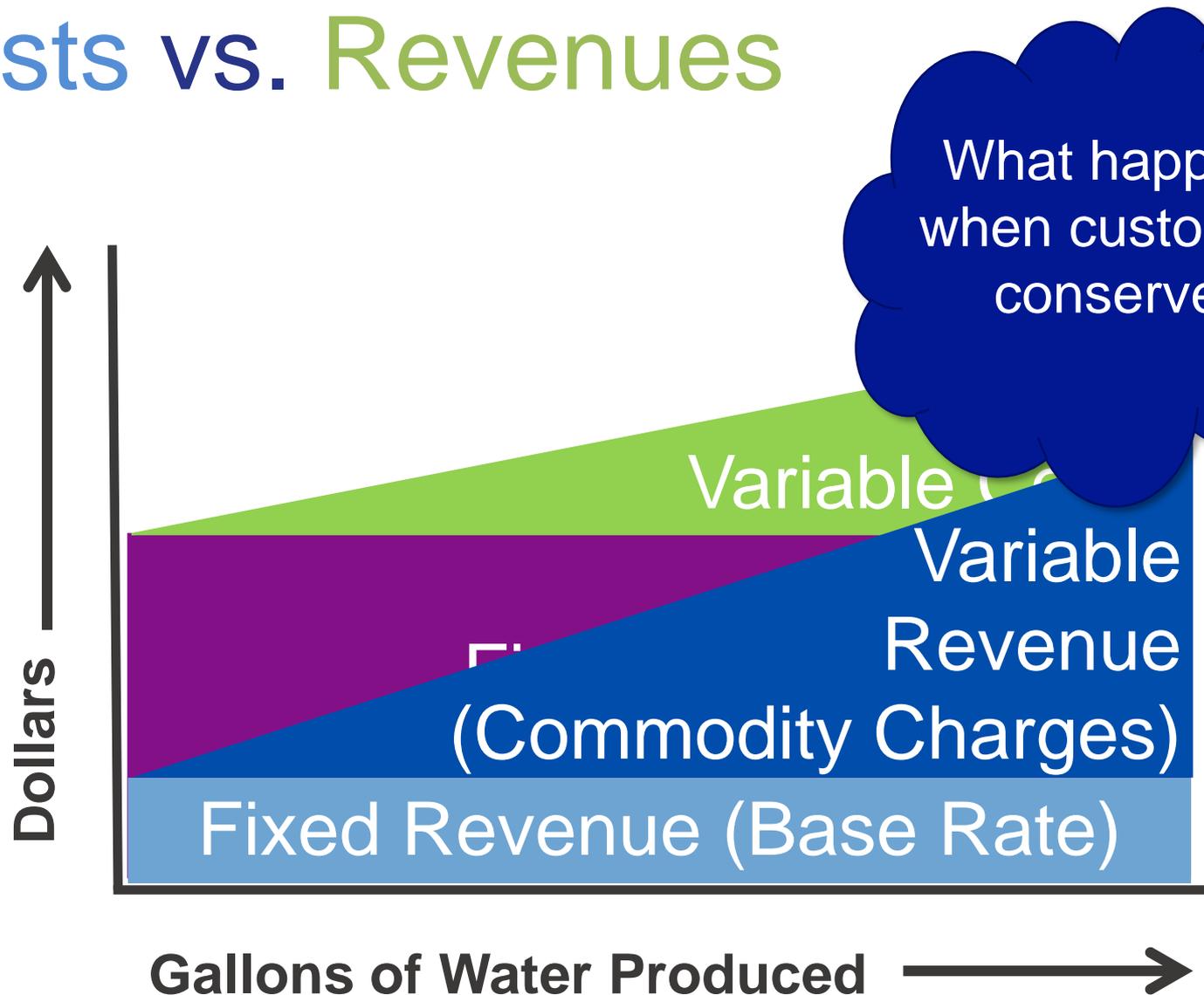
We collect less fixed revenue than the fixed costs



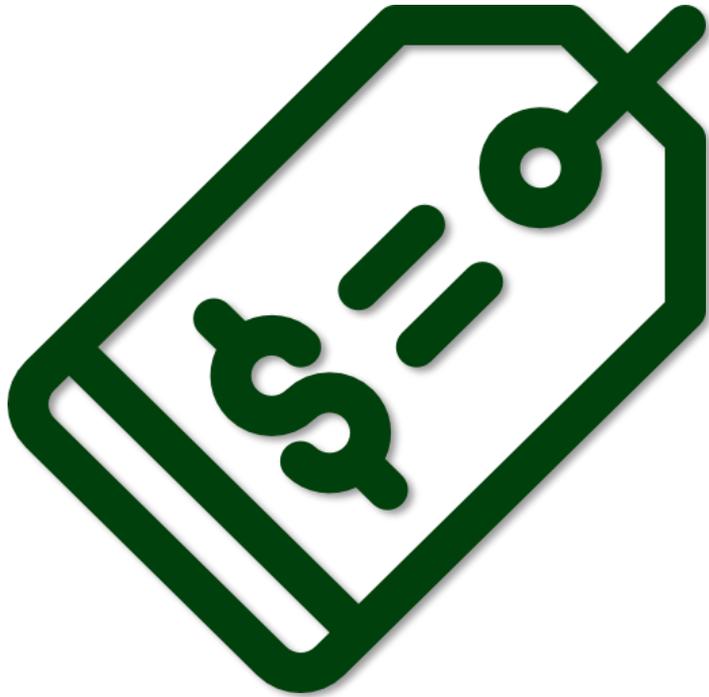
Costs vs. Revenues



Costs vs. Revenues



Two Approaches to Conservation



Pricing signals
through your rates



Non-price strategies



Pricing Strategies

- There is no single rate structure that can be called a conservation rate structure
- Many different rate designs can be used to encourage conservation. The devil is in the details

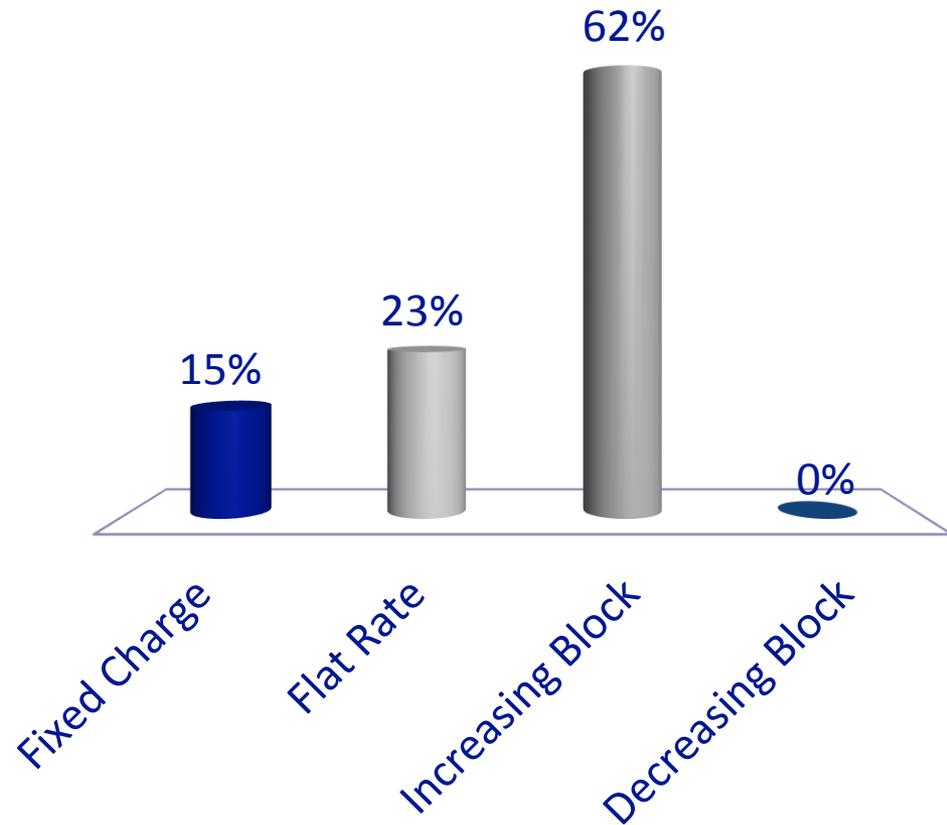


Pricing Strategies

- The rate level matters more than the rate structure
- Consider higher rates at average usage levels in addition to high levels, though be aware of affordability issues

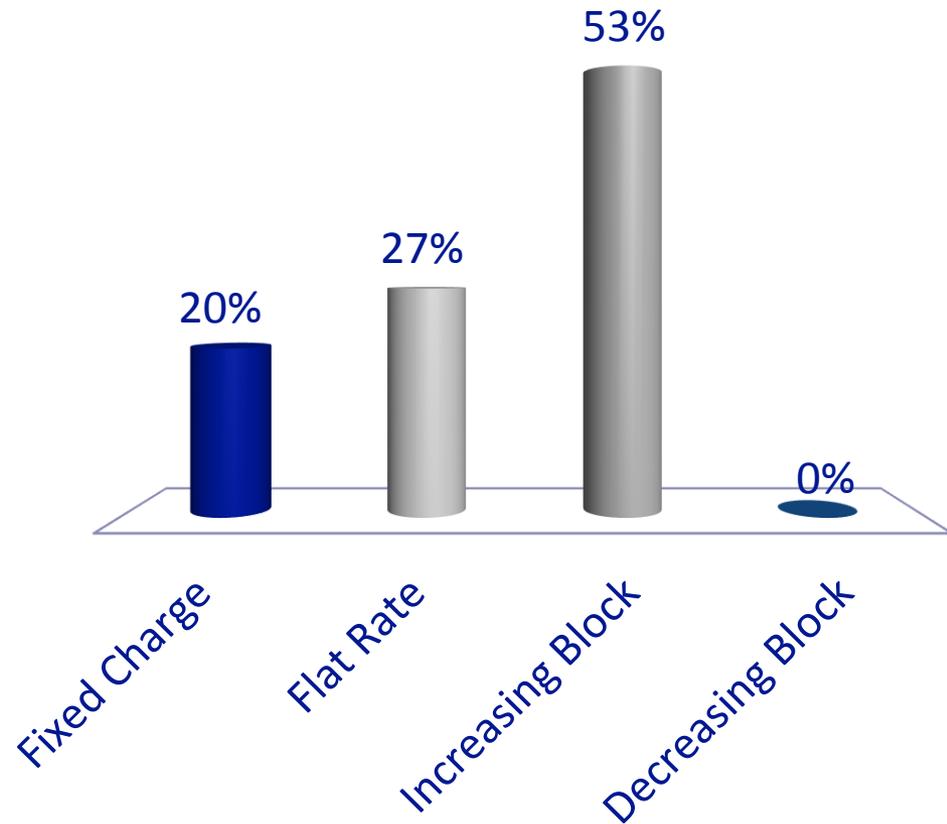
Volumetric Rates For Residents?

- A. Fixed Charge
- B. Flat Rate
- C. Increasing Block
- D. Decreasing Block



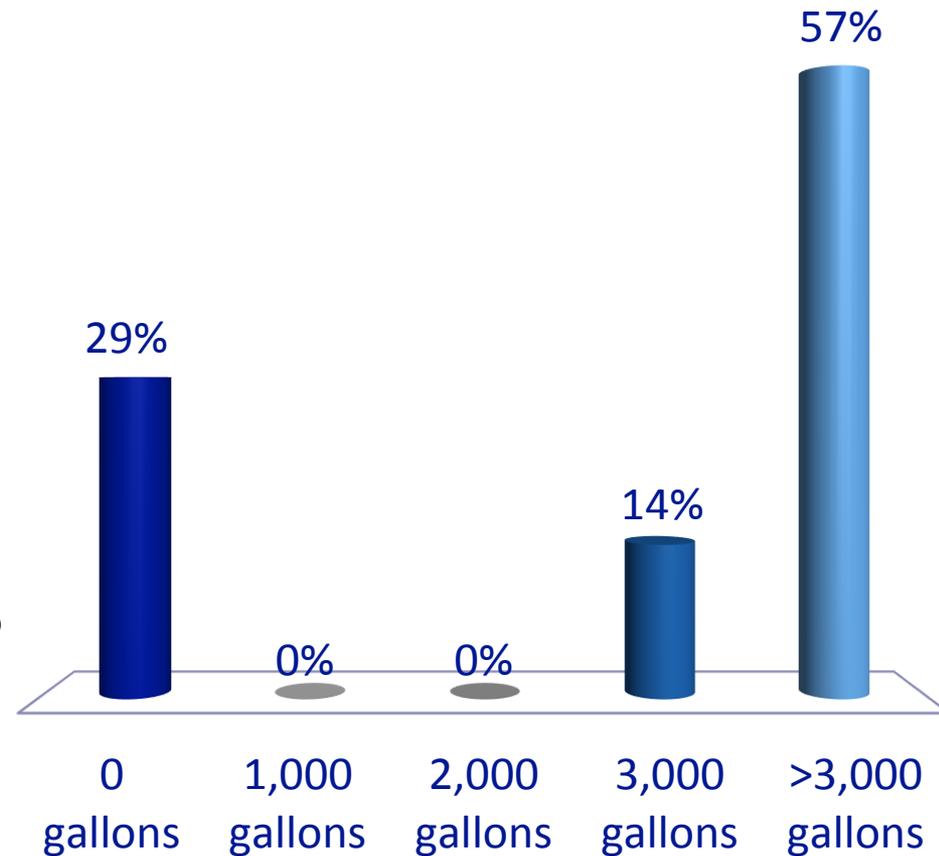
Volumetric Rates For Commercial/Industrial?

- A. Fixed Charge
- B. Flat Rate
- C. Increasing Block
- D. Decreasing Block



Consumption Allowance with Base Charge?

- A. 0 gallons
- B. 1,000 gallons
- C. 2,000 gallons
- D. 3,000 gallons
- E. >3,000 gallons



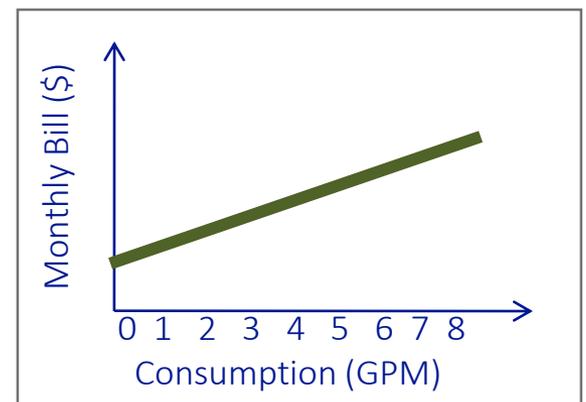
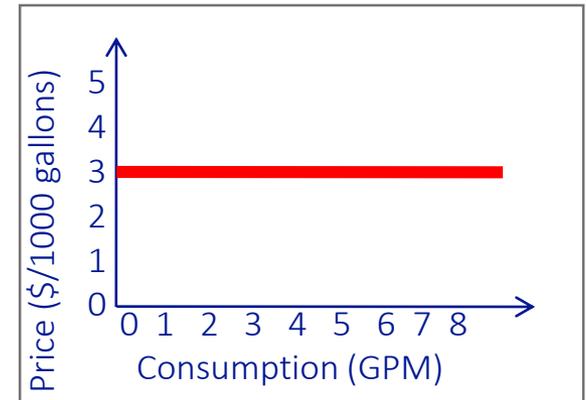


Higher Uniform Volumetric Charge

- Customer's bill is largely driven by usage, which gives them an incentive to conserve

Uniform (“Flat”) Rates

- Fair and simple





Higher Uniform Volumetric Charge

Base Fees:

Residential: 25.00

Commercial: 40.00

Distribution: 30.00

Usage fee: 14.75 per thousand gallons

Holiday Hills DWID, AZ



Higher Uniform Volumetric Charge

RESIDENTIAL RATES:

WATER BASE RATE--- \$22.00 PER 2000 GALLONS

\$13.00 FOR EACH 1000 GALLONS OVER THE MINIMUM OF 2000

Roper, NC



Low or No Base Charge, Higher Volumetric Charge

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

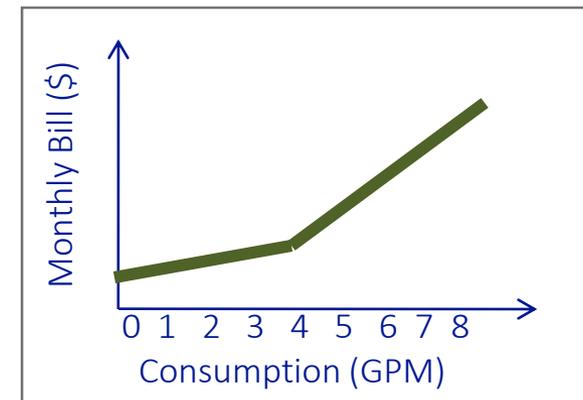
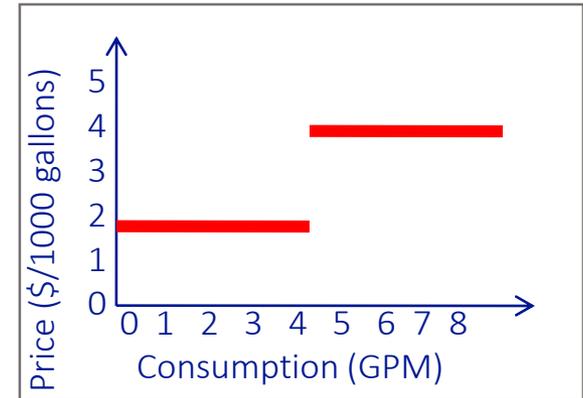


Increasing Block Rates

- At higher usage levels, the price increases, which encourages customers to cut back on usage

Increasing Block Rates

- Conservation-oriented
- Consider large families





Increasing Block Rates

Tier	Water Usage	Rate per 1,000 gallons (\$)
1	First 5,000 gallons or less	\$13.00
2	Next 5,001 – 15,000	\$17.75
3	Next 15,001 – 25,000 (Over 15,000 cattle lessees)	\$18.75
4	25,001 or more for all except cattle lessees	\$19.75

Napu'u Water Inc., HI

Increasing Block Rates

Water Consumption Charges

Water Consumption Charges Effective July 1, 2011		
Consumption/Month (in gallons)	Residential	Commercial**
0 - 2000	Base Rate (\$20.00)	Base Rate (\$20.00)
Up to 5,000	\$4.50/1,000 gallons	\$4.50/1,000 gallons
Up to 10,000	\$5.50/1,000 gallons	\$5.50/1,000 gallons
Up to 15,000	\$6.50/1,000 gallons	\$6.50/1,000 gallons
Up to 20,000	\$7.50/1,000 gallons	\$7.50/1,000 gallons
All over 20,000	\$8.50/1,000 gallons	\$8.50/1,000 gallons

Consumption over 2,000 gallons is billed retroactive to the first gallon used.

* Consumption over 2,000 gallons is billed retroactive to the first gallon used. ←

Currituck County, NC



Increasing Block with Low 1st Block

Base Water Rates (residential *effective 4/1/2015*)

Line Size	Inside City Limits	Outside City Limits
5/8 – 3/4 inch line	\$ 15.50	\$ 25.20
1 inch line	\$ 15.50	\$ 25.20

Volume Rate (residential *effective 4/1/2015*)

1 st 2,000 gallons	\$ 2.50 per 1,000 gal.	\$ 3.00 per 1,000 gal.
2,001 – 6,999 gallons	\$ 7.20 per 1,000 gal.	\$ 8.00 per 1,000 gal.
7,000 + gallons	\$ 9.00 per 1,000 gal.	\$ 9.00 per 1,000 gal.

Winder, GA



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

Please Don't Do This!!!!

fixed 1000	Per 1000 gal.	water	Per 1000 gal.	sewer	combined
	increase	11.66	increase	13.10	24.76
2000	2.43	14.09	3.67	16.77	30.86
3000	4.62	18.71	7.06	23.83	42.54
4000	5.38	24.09	7.35	31.18	55.27
5000	5.50	29.59	7.68	38.86	68.45
6000	5.75	35.34	7.82	46.68	82.02
7000	5.93	41.27	8.00	54.68	95.95
8000	6.12	47.39	8.20	62.88	110.27
9000	6.31	53.70	8.37	71.25	124.95
10000	6.31	60.01	8.37	79.62	139.63
11000	6.31	66.32	8.37	87.99	154.31
12000	6.31	72.63	8.37	96.36	168.99
13000	6.31	78.94	8.37	104.73	183.67
14000	6.31	85.25	8.37	113.10	198.35
15000	6.31	91.56	8.37	121.47	213.03
15001-99999999	6.51	98.07	8.56	130.03	228.10



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

Large Families



AMERICAN
FactFinder



MAIN

COMMUNITY FACTS

GUIDED SEARCH

ADVANCED

Community Facts - Find popular facts and frequently requested data about your community

1 Community Facts

2 Table Viewer

S2501

OCCUPANCY CHARACTERISTICS 
2012-2016 American Community Survey 5-Year Estimates

Large Families

Subject	Graham city, North Carolina			
	Occupied housing units		Owner-occupied housing units	
	Estimate	Margin of Error	Estimate	Margin of Error
Occupied housing units	6,131	+/-235	3,529	+/-282
HOUSEHOLD SIZE				
1-person household	33.4%	+/-3.6	32.6%	+/-5.0
2-person household	32.4%	+/-3.7	34.1%	+/-4.1
3-person household	17.7%	+/-3.1	15.9%	+/-3.5
4-or-more-person household	16.6%	+/-2.7	17.4%	+/-3.7

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Seasonal Rates

- Prices are higher during high-use times of year, encouraging conservation
- For most systems, this is the summer unless you are a winter holiday area or get a lot of snowbirds



Seasonal Rates

RATES AND CHARGES

OCTOBER THROUGH APRIL

\$ 3.00 PER 1,000 GALLONS

MAY THROUGH SEPTEMBER

\$ 4.60 PER 1,000 GALLONS

Cactus Stellar Limited, AZ



Seasonal Rates

TOWN OF IPSWICH WATER & SEWER RATES

WATER RATE

Non-residential water rate (Base Rate): \$8.33 per 100 cubic feet (Effective May 1, 2016)

Residential water rate (Seasonal Rate):

Summer (May 1, 2017 – September 30, 2017): \$12.50 per 100 cubic feet

Winter (Nov 1, 2016 – April 30, 2017): \$3.38 per 100 cubic feet

Ipswich, MA



Higher Irrigation Rates

- Meter and charge separately for outdoor water use and price that water higher than for regular water use



Higher Irrigation Rates

Residential

0 through 4,000 gallons	\$ 5.27 Per Thousand
4,001 through 9,000 gallons	\$ 8.10 Per Thousand
9,001 gallons and up	\$ 10.90 Per Thousand

Commercial, Apartments and Mobile Home Parks

0 through 10,000	\$ 6.69 Per Thousand
10,000 and up	\$ 8.03 Per Thousand

Irrigation

Per thousand gallons	\$ 10.72
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Stockbridge, GA



Higher Irrigation Rates

IRRIGATION BASE WATER RATES (Residential and Commercial)

Inside Southport City Limits \$7.45

Outside City Limits: \$11.18

Usage Rates 0-10,000 gallons

Inside Southport City Limits: \$5.50 per 1,000 gal.

Outside City Limits: \$8.25 per 1,000 gal.

Usage Rates > 10,000 gallons

Inside Southport City Limits: \$7.00 per 1,000 gal.

Outside City Limits: \$10.50 per 1,000 gal.

Southbridge, NC



Higher Irrigation Rates

Rate Structure for Residential Customers:

0	--	2,000 gallons	\$22.00 minimum
2,100	--	7,000 gallons	\$ 5.50/thousand

Irrigation Rate (for those with an irrigation meter only):

0	--	2,000 gallons	\$22.00 minimum
2,100	--	10,000 gallons	\$15.00 per thousand
10,100	--	up	\$20.00 per thousand

Marbury Water System, AZ



Low Supply and Drought Surcharges

- Prices increase only when supplies of water are limited, encouraging conservation at crucial times

Drought Surcharges

Water shortage stage	Water use <u>Block 1</u> 1,000-2,000 gallons	Water use <u>Block 2</u> 3,000-5,000 gallons
Stage 1	No surcharge	No surcharge
Stage 2	No surcharge	1.25 x Block 2 rate
Stage 3, Emergency	No surcharge	1.5 x Block 2 rate

Water use <u>Block 3</u> 6,000-10,000 gallons	Water use <u>Block 4</u> 11,000-15,000 gallons	Water use <u>Block 5</u> 16,000 or more gallons
1.25 x Block 3 rate	1.5 x Block 4 rate	2 x Block 5 rate
1.5 x Block 3 rate	2 x Block 4 rate	3 x Block 5 rate
2 x Block 3 rate	3 x Block 4 rate	4 x Block 5 rate

Orange Water & Sewer Authority, NC



Low Supply Surcharges

COMMODITY RATES PER 1,000 GALLONS PER MONTH BY CONSERVATION STAGE IN EFFECT

(Zero Gallons Included in Base Rate)		Stages 1 & 2	Stage 3 ^a	Stage 4 ^a
1st Tier: 0 – 4,000 Gallons	\$	6.80	6.80	6.80
2nd Tier: 4,001 – 13,000 Gallons	\$	10.20	10.20	10.20
3rd Tier: 13,001 – 20,000 Gallons	\$	12.30	15.00	20.00
4th Tier: 20,001 – 30,000 Gallons	\$	12.42	20.00	40.00
5th Tier: over 30,000 Gallons	\$	12.55	30.00	70.00

^a Stage 3 and 4 water resource conditions are reached when any combination of build-out, water use, and adjustments to useable CAP allocation causes 80% or 90%, respectively, of the total useable CAP allocation to be used (see Policies & Procedures).

Tonto Hills Water Improvement District, AZ



Drought Surcharges

3. That the above rates charged for non wholesale water customers shall be increased for any consumption above 2,000 as follows when the water level at the Lake of Egypt spillway, at any time during a billing cycle, falls below the levels specified:
 - a. 24 inches below spillway rates shall increase \$1.00
Per thousand gallons
 - b. 30 inches below spillway rates shall increase \$2.00
Per thousand gallons
 - c. 36 inches below spillway rates shall increase \$3.00
Per thousand gallons
 - d. 40 inches below spillway rates shall increase \$5.00
Per thousand gallons
 - e. 48 inches below spillway rates shall increase \$10.00
Per thousand gallons

Lake of Egypt, IL

<http://efc.web.unc.edu/2015/11/23/key-financial-benchmarks-for-water-systems-conservation-signal/>



Key Financial Benchmarks for Water Systems: Conservation Signal

NOVEMBER 23, 2015 / GLENN BARNES / 2 COMMENTS

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At our [workshops](#) and through our discussions with water systems during [technical assistance](#) work, many water systems, in particular small systems, ask what seems like a simple question: “Are our rates right?”

I suspect our initial answer is somewhat unsatisfying: “It depends.”

Even when rates are sufficient to generate the revenues needed for the utility, whether or not rates are “right” depends on what a particular water system

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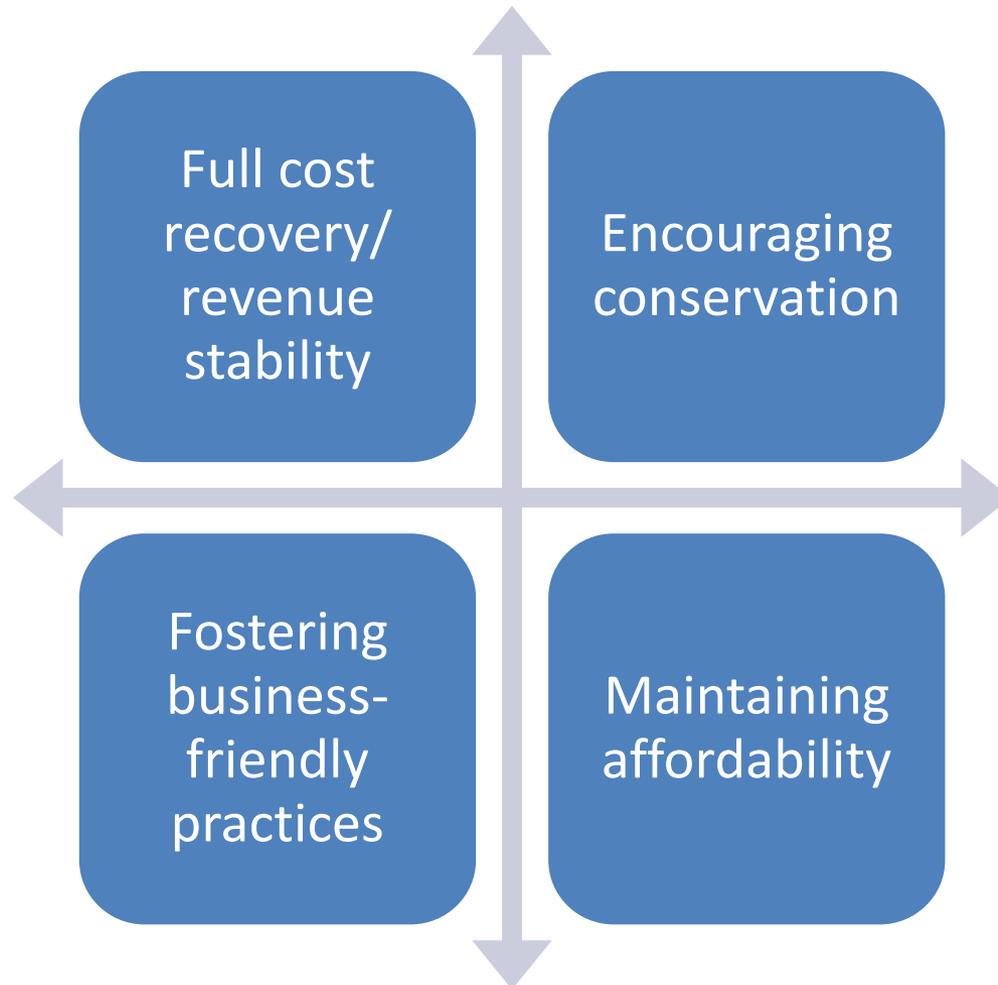
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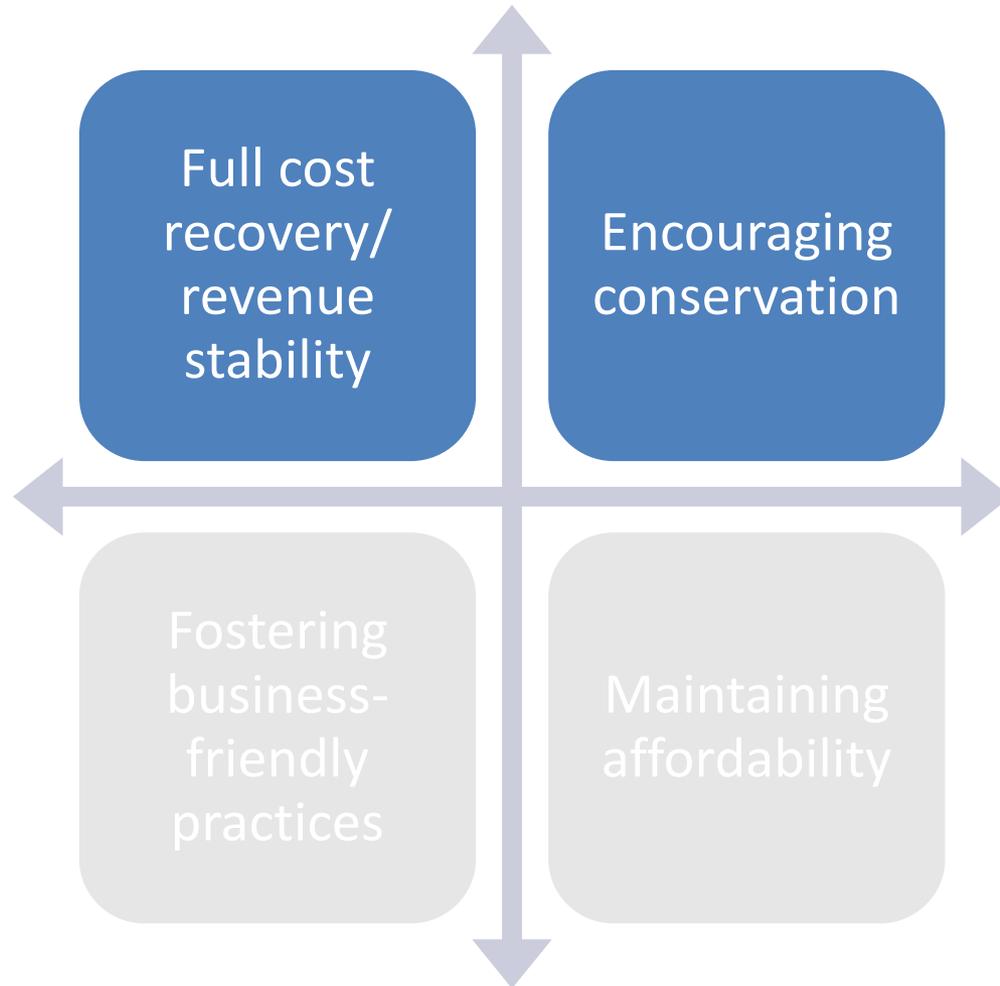




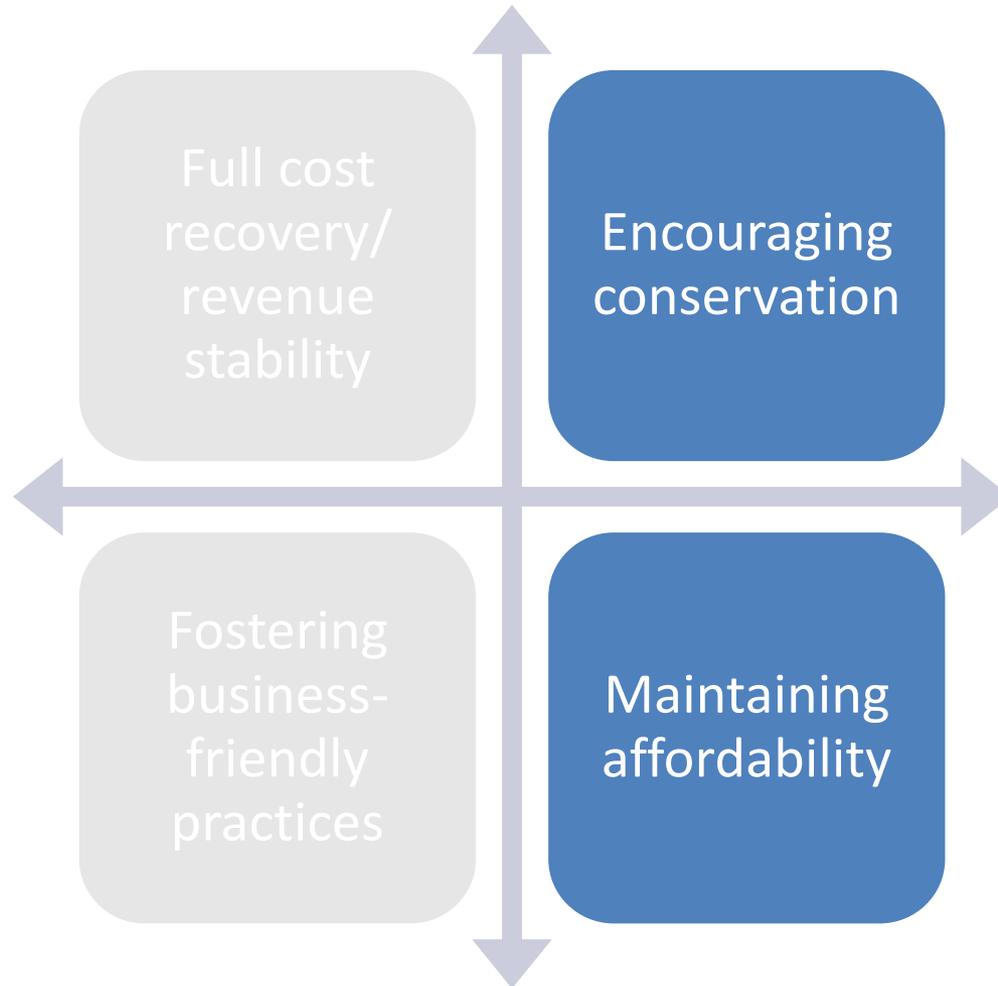
Water System Objectives



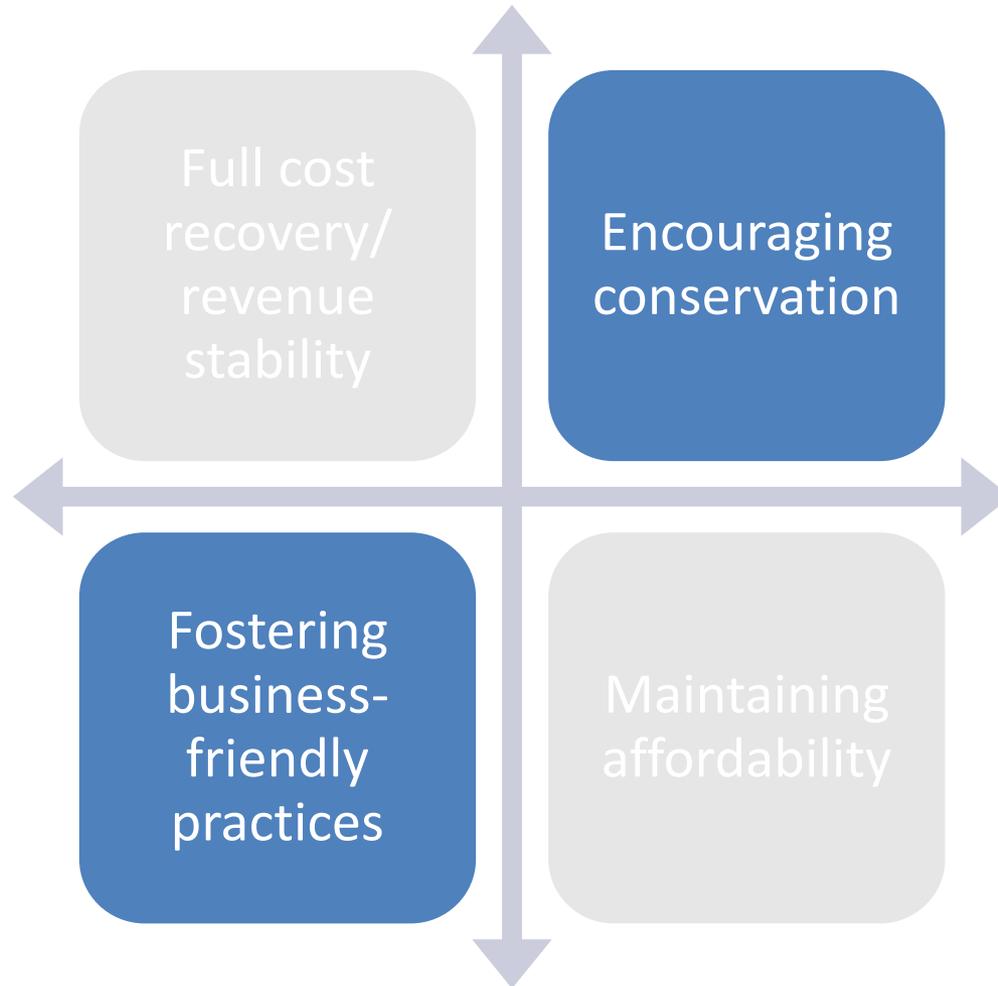
Competing Objectives



Competing Objectives



Competing Objectives

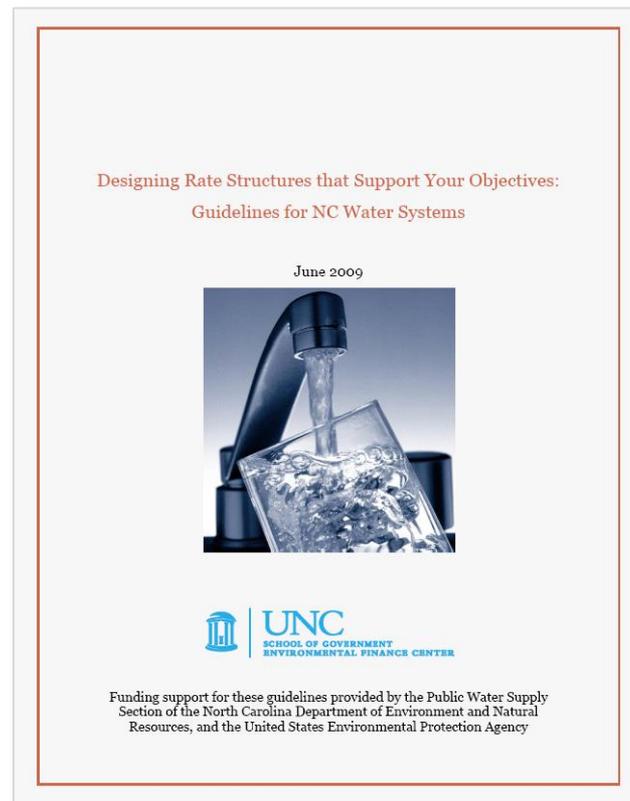


Designing Rate Structures That Support Your Objectives

Free guide
written for
system
managers

Available at:

<http://efc.sog.unc.edu/>





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